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Structural equation model for effective CRM of information infrastructure industry in Korea

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Abstract

In Korea, information infrastructure industry has been expanding its business. However, service level of information infrastructure has not reached the expected level of customers in the context of CRM (Customer Relationship Management) yet. In this paper, we develop a structural equation model for Customer Satisfaction Index (CSI) to measure the quality level of information infrastructure reflecting the aspects of information infrastructure industry. Then, we compare the KII (Korea Information Infrastructure) satisfaction Indices from various customer groups using the structural equation model (SEM). It is expected that the results of our study suggest helpful strategies to increase the satisfaction level of KII customers.

Keywords: Korea Information Infrastructure (KII); Customer Satisfaction Index (CSI); Structural equation model (SEM); Customer Relationship Management (CRM)

1. Introduction

The scope and depth of the Internet is exponentially increasing, thus motivating Internet service providers to provide differentiated service quality in diverse ways. The National Computerization Agency (NCA) has been providing Korea Information Infrastructure Government Service (KII-G) to government ministries, research organizations, educational organizations, medical organization and others since 1995. The goal of the KII-G project was to construct a nationwide information infrastructure with high-speed and high-capability broadband access to KII customers at reasonable rates. Currently the NCA provides services with more than thirty five thousand network lines (NCA, 2004).

The common practice of the internet service model in Korea is that the service provider also plays the role of network provider. For instance, Korea Telecom, Hanaro Telecom, and Thrunet are major service providers (SP) in Korea and they also build the network as the network providers (NP).

Unlike other internet services, however, the NCA is the exclusive SP for the KII-G project while Korea Telecom and Dacom are contract NPs for the NCA and are responsible for building the networks.

Consequently, KII subscribers purchase KII Service from the NCA, but one of the NPs installs the networks. There is even the possibility that some subscribers may have two NPs.

Ultimately, the NCA wants to satisfy their customers' expectations. Therefore, in order to design a strategy for improving subscribers' satisfaction with KII-G, an understanding of the relationship between SP and NP is crucial.

Recently, several studies have attempted to find factors affecting customer satisfaction with the service provider or network provider (ITU, 1993; Jang, 2000; Sohn, 2001; Lu & Lin, 2002). However, none of these studies have considered satisfaction with respect to the combined aspects of the SP and NP. Also, many of these studies failed to provide a structural relationship among the

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various factors related to customer satisfaction along with these aspects.

If one can find the causal relationship among various factors and can compare the level of customer satisfaction over different types of SP or NP, the KII industry can establish more effective CRM by setting the priority on more influential factors.

In this paper, we propose a structural equation model (SEM) that accommodates aspects of both the SP and NP in order to evaluate the satisfaction of various customer groups.

Since Fornell (1992) developed an SEM to estimate the American Customer Satisfaction Index (ACSI), the use of an SEM has become popular for customer satisfaction in various areas (Sohn & Moon, 2003; Byrd & Turner, 2001; Choi, 2002; Gerpott, Rams, & Schindler, 2001; Kim & Yoon, 2004; Lu, Yao, & Yu, 2005; Rondeau, Ragu-Nathan, & Vonderembse, 2005; Kim et al., 2007; Lin, 2007; Joo & Sohn, 2008).

Based on the proposed SEM, the KIICSI (Korea Internet Infrastructure Customer Satisfaction Index) is calculated to compare various customer groups. This result can then be used to provide feedback information for the improvement of KII service quality.

This article is organized as follows: Section 2 presents a review of related literature. In Section 3, we propose an SEM for KIICSI. In Section 4, empirical analysis for KIICSI is performed and strategic perspectives for improving the quality of KII service are suggested. Finally, implications of the study and suggestions for future research are presented in Section 5.

2. Literature review

In this section, we briefly review the measurement methods and results of previous studies on the service quality of telecommunication services. Studies regarding the quality of telecommunication services have been systematically carried out by the ITU (International Telecommunication Union). In 1988, the ITU published the Blue Book that defined network performance and Quality of Service (QoS). Many quality elements considered in QoS influence customer satisfaction. One of them is the connection quality, defined as "the collective effect of service performance, which determines the degree of satisfaction of a user with the particular connection." It is related to the issues of quality from the NP. Nevertheless, the QoS significantly addresses the issue of security since it is an integral element of quality service delivery. The telecommunication services should be addressing the issues of quality as a critical element for operability (Kemel & Wahba, 2004).

SLA (Service Level Agreement) is a formally negotiated agreement between a service provider (SP) and a service subscriber's organization. It is now widely accepted that service provision and receipt should be governed by an agreement. This is essential to defining the parameters of the service, for the benefit of both the provider and the recipient. Usually in measurable terms, SLA is defined as the quality of services provided from the SP. Through the supported service of SLA, the service provider can differentiate itself from its competitors and prioritize service improvement opportunities. From the viewpoint of the consumer, s/he may desire to access a service of her/his own choice and to validate the quality of the service provided.

Most previous studies considered the quality of the telecommunication service with respect to the performance of the mechanical side, such as connection speeds and security of the broadband offerings. However, in the area of telecommunication, according to the user group, the satisfaction level depends not only on mechanical aspects, but also on various additional aspects such as the application process, education, cost, and so on (ITU, 1993; Jang, 2000; Sohn, 2001; Lu & Lin, 2002).

In this paper, we review the studies on how quality affects user satisfaction with respect to service application, mechanical quality, physical and technical support, and resulting performance.

Firstly, with respect to the service application, the Korea consumer protection board (KCPB, 2001) and the SLA of ISP (Internet Service Provider) in Korea (NCA, 2003) found that the factors affecting satisfaction were quickness of service application and convenience of service offering. Commonly, the processing of the service application is time consuming and costly. Therefore, improving quickness and convenience can effectively improve user satisfaction.

Secondly, Choi and Hong (2002) suggested that service quality is influenced by service performance and security, including network management, speed, loss rates, interruption, transmission performance, and security level. These are similar to the elements of QoS. Yu (2002) revealed the importance of the relationship between the service performance (no interruption, connection problem, and transmission speed) and customer satisfaction and security.

Thirdly, with respect to service support, the Ministry of Information and Communication (MIC, 2003) found physical and technical factors affecting telecommunication user satisfaction levels, including technical support, quickness of service, service education, and service stability. Trans European Services for Telecommunications (TESTA) regulates service support factors such as minimal recovery time, Help-Desk kindness and the technical service support center (NCA, 2003). The Federal Technology Service (FTS) (GSA, 2004) annually surveys the subscriber's satisfaction level and the following factors are considered to be important: high quality network services at low costs, overall cost, accurate fare charging, network availability, satisfaction with complaint handling, and security.

Additionally, for the internet service industry, Rich and Dana (2002) considered service quality, technical support, brand image, education, and the level of billing rates as important elements of service quality.

In summary, we considered the following factors for our structural equation model: service application factors with respect to service application; service performance and