

Structural equation model for effective CRM of digital content industry

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Abstract

Digital contents industry has been expanding its business based on broadband internet technology. But service level of contents provider has not reached the expected level of customers in the context of CRM yet. In this paper, we develop a structural equation model for customer satisfaction index (CSI) to measure the level of digital contents service quality reflecting the aspects of contents quality, service quality and provider quality. Our proposed model is applied to various types of contents such as on-line games, mobile contents, internet VOD services and e-music. The results give us the controllable feedback information to effectively improve customer satisfaction for each kind of digital content industry.

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1. Introduction

As the knowledge and information integrated society comes to arrive, digital contents industry is regarded as a novel knowledge-integrated industry geared up with hi-tech industry and creative idea.

Recently the digital contents service industry has grown rapidly in the form of on-line game, mobile contents, e-book, e-learning, internet broadcasting, and e-music. This is mainly due to the advancement in infrastructure of information system and the development of internet.

Along with the birth of new technology, such as a ubiquitous network environment and an intelligent handheld device, the market of wired internet contents is expanding to the market of wireless internet contents. Its market size is expected to grow from 0.48 billion dollars in year 2001 to 1.45 billion dollars in year 2002, and in year 2003 it is expected to be 2.33 billion dollars, which is raised by more than 70%.

In Korea, with the objective of becoming one of the five major digital content countries, the government encourages

the development of digital content production technology. Key research that took place in the digital contents field in 2004 includes digital technology designed to support high-quality digital video production, game engines which are compatible with both PC and PS2, and DRM-related technology that aims to protect digital contents and IPRs (Intellectual Property Rights) (MIC, 2005).

Although the digital contents industry is expected to show high potential of growth due to the rapid growth in mobile industry, the market has its own problems of low re-purchasing rate for the digital contents according to the study of Korea Information Strategy Development Institute (2000). This is mainly resulted from the extremely low satisfaction of such contents.

In the context of CRM (customer relationship management), the improvement of customer satisfaction is crucial. There would be various factors affecting the customer satisfaction of digital contents. Those factors would include the various aspects, such as digital content's quality itself, the quality of service and the quality of contents provider. Therefore it is hard to increase the customer satisfaction just by improving one factor. In addition, satisfaction level would vary depending on the types of contents, such as on-line games, mobile contents, internet VOD services and e-music.

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If one can find the causal relationship among various factors and can compare the level of customer satisfaction over different types of contents, the digital contents industry can establish more effective and contents specific marketing plans for CRM by setting the priority on more influential factors.

For this purpose, we propose a structural equation model (SEM) that is designed to figure out both direct and indirect effects of the casual relationship between the factors and customer satisfaction with respect to content type. Additionally, we obtain the customer satisfaction index (CSI) similar to ACSI (American CSI) concept (Fornell, Johnson, Anderson, Cha, & Bryant, 1996).

We expect that our proposed model will bring meaningful results by presenting the feedback information, which would be utilized to increase the customer's satisfaction and the re-purchasing rate.

This paper is organized as follows. In Section 2, we review related literature. In Section 3, we propose a structural equation model for the customer satisfaction index for digital content industry. In Section 4, empirical data analysis is performed. Finally, in Section 5, we discuss the results of our study and suggest the direction for future research.

2. Literature review

SEM is basically formulated by two types of equations: measurement equation and construct equation. While the measurement equations can be adopted to study the relationship between observed variables and latent factors, the construct equations can be used to assess the hypothesized relationship among latent factors.

SEM has been applied to technology management areas. Davis, Bagozzi, and Warshaw (1989) proposed the technology acceptance model (TAM) in order to explain and predict user acceptance of information systems (IS) or information technology (IT). Within TAM, perceived usefulness was used as a major factor, and perceived ease of use as a secondary factor, in determining system usage (Davis et al., 1989). Shih (2004) proposed the TAM to predict consumer's e-shopping behavior. This model not only includes perceived easiness of use, perceived usefulness, attitudes toward e-shopping and user acceptance, but also adopts the Web environmental factors as the facilitating conditions of e-shopping with respect to the websites [16]. Sohn and Moon (2003) used an SEM to forecast the 'technology commercialization success index (TCSI)' in relation to technology developer, technology receiver, technology transfer center, and environmental factors.

In terms of the evaluation of the service quality in SEM, Parasuraman, Zeithaml, and Berry (1988) proposed the SERVQUAL to evaluate service quality by considering five distinct dimensions: tangibles, reliability, responsiveness, assurance, and empathy. The SERVQUAL instrument is designed for use in a broad set of service business and provides a basic skeleton through its expectations/perceptions

format, encompassing statements for each of the five dimensions. These dimensions can be considered to measure CSI of digital contents.

With respect to the digital contents, Bharati and Chaudhury (2004) used a structural equation model (SEM) to identify the factors that affect satisfaction in web-based decision support system based on system quality, information quality, and information presentation related factors. Huang (2000) documented an effort to experimentally examine the effects of information characteristics of Web shopping sites on consumers' desire to approach the sites using the structural equation model. Krishnan and Ramaswamy (1998) provided a framework to understand the drivers of overall customer satisfaction with Intranet solutions. The authors studied the importance of cost of ownership, perceived benefits in terms of improved competitive advantage and personnel productivity in determining overall customer satisfaction with the Intranet solutions. Bhattacharjee (2001) examined key drivers of consumers' intention to continue using business-to-consumer e-commerce services. Miranda-Gonzalez and Bane-gil-Palacios (2004) provided a detailed and original Web Assessment Index, which focuses on four categories: accessibility, speed, navigability and content. The scoring mechanism was explained and the index is applied to assess the web sites of the largest firms in Spain. Multiple theoretical perspectives were synthesized to hypothesize a model of continuance behavior, which is then empirically tested using a field survey of online brokerage users (Bhattacharjee, 2001). Negash, Ryan, and Igbaria (2003) identified and empirically established the quality dimensions of Web-based customer support system as the information quality, system quality, and service quality. The results of this study indicated that information and the system quality can influence the effectiveness (satisfaction) while the service quality has no impact on the satisfaction (Negash et al., 2003). Selnes and Gønhaug (2000) argued that high reliability of a supplier had shown a strong positive effect on satisfaction with the supplier, which subsequently increased customer's loyalty. So the reliability for a supplier has an important issue for the satisfaction.

Based on the reviewed literature, we group factors affecting customer satisfaction of digital contents as the digital content's quality itself, the quality of service and the quality of content provider.

3. Research hypothesis and proposed SEM

On the basis of the literatures, as summarized in Table 1, we define the factors that affect customer's satisfaction of digital contents service with the following five elements within the three dimensions of quality (content provider, content itself, and service provider): the provider reliability, content usefulness, content efficiency, service stability, and service responsiveness. The reliability of contents provider is the degree of faith for the provider. Content usefulness is defined by how well and easy customers utilize the

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