Chapter 5.12
Gaining Insight into Cognitive Structure Using GALILEO Method:
Where is Your Web Site in the Customers' Cognitive Space?

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ABSTRACT

In this article we introduce a multidimensional systems evaluation technique for tapping into the group cognitive structure. The objective is to illustrate how GALILEO assists in mapping the multidimensional cognitive domain of user evaluations in order to subsequently identify strategies to build customer loyalty and lock-in with e-commerce websites. A popular approach for understanding the structure of relationships between constructs is Multi-Dimensional Scaling (MDS). GALILEO is a very powerful multidimensional scaling technique developed by researchers in the area of communications and cognitive science but has not been applied to systems evaluation. The main goal of this study is to demonstrate the GALILEO method as a tool for evaluating emerging and existing technology and service innovations. The power of the GALILEO approach is illustrated by examining key dimensions of two leading e-commerce websites – Amazon.com and BN.com (Barnes & Noble).

INTRODUCTION

Gaining loyalty and in particular E-Loyalty is a critical step in developing customer lock-in. Cognitive lock-in is strongly linked to evolving customers' feelings and perceptions related to prior shopping experiences on a website (Johnson, Bellman, & Lohse, 2003). Consumer trust in the web retail environment is critical for B2C ecommerce where the possibility exists that web retailers will take advantage of online consumers. Trust in the web retail environment is the "willingness of the consumer to rely on the [web retailer] when there is vulnerability for the consumer" (Jarvenpaa et al., 1999, p. 2). A customer's cognitive evaluation of a website's quality in terms of usability and other factors affects behavioral intentions and positive experiences contribute to the likelihood of a purchase decision and are the key to attaining competitive advantage (Devaraj, Fan, & Kohli, 2003). This has prompted academic researchers and practitioners to focus on the cognitive domain in terms of website usability (e.g. Ba & Pavlou, 2002; Kim, Lee, & Choi, 2003; Moon & Sanders, 2004).

Proper marketing strategies cannot be established without understanding customers' complicated and multidimensional cognitive domain. Companies have invested significant resources to gain insight into customers' cognitive domain through various methods of analyses. The mainstream methods for analyzing online customers' cognitive structures in the area of marketing and information systems research are generally based on statistics that use Likert-scale based surveys and click-stream histories. However multidimensional scaling (MDS) methods have also been used to examine human cognitive processes in marketing research (DeSarbo & Wu, 2001).

The GALILEO method, devised by Woelfel and Fink in 1970s, is a very powerful MDS method that has rarely been applied in the mar-

keting literature and never in the information systems literature. The GALILEO method is an appropriate modeling tool 1) when holistic models of multidimensional cognitive structure and processes are required and 2) more precise results are required than with conventional survey methods (Colfer, Wolfel, Wadley, & Harwell, 2001). E-business gradually requires understanding on users' cognitive structure more and more as it evolves towards inter-operable environment. Also, there have been a lot of instructions for the successful e-business, but there has been no way to evaluate how successfully an e-business firm follows such instructions. For instance, we know that "easy interface to use" is very important, yet the method to figure out "how easy our system is" or "how customers perceive our system" may not be found.

GALILEO has strong roots in both statistics and applied mathematical theory. The foundations of GALILEO theory have been developed and instantiated into a computerized system called GALILEO. The GALILEO system is composed of several sub-functions, and these sub-functions will be described in the next section.

As noted earlier, the GALILEO system has not been introduced in the information systems and e-business areas, despite its renowned efficacy in the area of communication and cognitive science. In this article, we demonstrate GALILEO system's potential as a tool for analyzing online customers' cognitive structure and for creating strategies for revamping and reconstructing a Web site. We will illustrate the power of GALILEO by illustrating how it can be used to construct a group cognitive structure for Amazon.com and BN.com (Barnes & Noble). We will show the usefulness of GALILEO in exploring online customers' multidimensional cognitive structures and its potential as a benchmarking tool.

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