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BUSINESS TO CONSUMER ELECTRONIC COMMERCE
WEBSITE QUALITY: INTEGRATING INFORMATION
AND SERVICE DIMENSIONS

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Abstract

A method for obtaining user feedback on the overall quality of B2C electronic commerce websites is discussed. Previous research in information quality and service quality are used as a springboard for the proposed conceptual model and for the development of an instrument to measure website quality. User evaluations are captured in terms of both the information and the process aspects of website quality.

Keywords: Electronic commerce, information, service, quality

Introduction

The widespread adoption of computers and networking technologies by individuals and businesses has led to a concept known as Business-to-Consumer (B2C) electronic commerce. The selling of goods and services via the Internet was initially seen by many as a “magic bullet” (Markus & Benjamin 1997) capable of replacing sound business principles with technology. Companies produced websites using a wide range of questionable design guidelines and business plans. Because of this lack of foresight many of the initial forays into electronic commerce by the “dot-com” stars of the late 1990s have become the failures known as “dot-gones” and “dot-bombs.” This rapidly changing business environment has revealed the uncertainty and risk associated with undertaking a B2C project and has demonstrated that the mere creation of an electronic storefront, web presence, or B2C website does not spell success in the marketplace.

The focus of e-commerce research in the 1990s was on the development of the technologies and architectures that would enable the construction of websites that linked businesses and consumers in the “new economy.” The design of high quality websites, however, has not been a major focus of either IS organizations (Melymuka 2001) or researchers. This is an area ripe for research, with one major need being the evaluation of customer preferences and their effect on web design (Kalakota & Whinston 1996). Insight in this area can be derived by leveraging existing research from the fields of consumer behavior and information systems into a coherent model of overall website quality.

When examining a website from a systems analysis and design perspective two major components must be considered, the data and the processes. Literature on information (or data) quality can inform research on the data component of a website while marketing literature informs research into the processes that must be considered in a B2C website. A conceptual model of data quality (Wang & Strong 1996) provides a basis for examining the various dimensions of information products. A conceptual model of service quality (Parasuraman, Zeithaml, & Berry; 1985, 1993, 1994) informs research into customer expectations and perceptions of the processes websites must support. This model provides a validated research instrument (SERVQUAL) for examining service quality. The integration of these models provides a base from which to explore factors affecting consumer expectations and perceptions of B2C websites and potentially their overall satisfaction with these sites.
Conceptual Model of B2C Website Quality

By extending previous research in information quality and service quality, a conceptual model of the factors potentially influencing consumer perceptions of B2C websites has been developed. The model shown in Figure 1 synthesizes two existing conceptual models. The underlying premise is that two major quality constructs, one of which focuses on the information, and the other, which focuses on the processes that deliver the information, determine B2C Website quality. The Information Systems Success Model (DeLone & McLean 1992) provides conceptual support for this model. Each of these major constructs has been conceptualized as consisting of a number of quality dimensions, which are listed in the column on the left side of Figure 1.

![Figure 1. A Conceptual Model of B2C Website Quality](image)

**Service Quality**

The construct service quality has been defined as the degree of discrepancy between customers’ normative expectations for service and their perceptions of service performance (Parasuraman et al. 1985). The higher-order construct service quality was originally posited as being composed of 10 lower-order constructs: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding, and tangibles (Parasuraman, et al. 1985). This construct has since been refined and operationalized via the SERVQUAL instrument that measures the difference in perceptions and expectations using 22 items that measure the dimensions: tangibility, responsiveness, reliability, assurance, and empathy (Figure 1). The tangibility construct relates to the physical evidence of service: facilities, equipment, and personnel. Reliability looks at consistency of performance and dependability. Responsiveness relates to timelines of service. Assurance looks at the competence and courtesy of employees and their ability to inspired confidence and trust. And empathy relates to access and understanding provided by employees (Parasuraman et al. 1988). An extension of the service quality concept is the zone of tolerance, which represents the range of service a consumer would consider satisfactory (Parasuraman et al. 1994). The zone of tolerance measures the consumer’s expectations of desired service (what consumers believe can and should be provided) and adequate service (the minimum level of acceptable service to the consumer) in an alternative SERVQUAL format. SERVQUAL has been validated in a number of industrial settings including some within the field of information systems research. The primary use of SERVQUAL, modified for IS services quality, has related to the delivery of information services by IS departments (Pitt, Watson, & Kavan 1995, 1997; Kettinger & Lee 1995). The use of SERVQUAL in exploring websites is limited and its implementation has differed in that measures of consumer expectations were omitted from the newly created instrument, WEBQUAL (Barnes & Vidgen 2000). The implementation of WEBQUAL for B2C website evaluation, while shown to be somewhat useful in comparing competing sites omits information needed to identify the gaps between expectations and perceptions that researchers need to identify critical quality dimensions and that managers need to assess system development and modification efforts (Kettinger & Lee 1997; Pitt et al. 1997).

**Information Product Quality**

Information quality is a construct that has been measured in various ways over the past three decades and is considered a critical construct in determining information system success (DeLone & McLean 1992). One of the most comprehensive frameworks for classifying data quality categorizes twenty data quality dimensions into four major data quality constructs: intrinsic data quality, contextual data quality, representational data quality, and accessibility data quality (Wang & Strong 1996). Intrinsic data quality looks at the accuracy, objectivity, and believability of data, which is similar to the assurance construct in service quality. Contextual data quality considers the timeliness, amount of data, completeness, and relevance of data and therefore overlaps the
responsiveness construct of service quality. Representation data quality examines understandability interpretability, and consistency of data and therefore has aspects in common with the reliability construct as it relates to service quality. Accessibility examines access and security of data, which is similar to the empathy construct of SERVQUAL. While not fully validated, this framework has been used as the foundation from which a 41-item instrument was developed to measure information quality of websites (Katerattanakul & Siau 1999). This instrument is much more comprehensive than measurements of information quality seen previously. This initial effort reported some consistency with the data quality framework in the areas of contextual and accessibility information quality. Clearly more work is needed to measure the dimensions of this multidimensional construct. One approach is to extend the concept of assessing gaps in user’s normative expectations of information quality and perceptions along four major information quality constructs as well as measuring minimum acceptable levels of information quality. This approach would be consistent with the approach for measuring the zone of tolerance for service quality dimensions (Parasuraman et al. 1994).

**Rational for Model Integration**

DeLone & McLean (1992) call for research into the major constructs that determine information success, which includes the joint effects of system quality and information quality on system use, user satisfaction and ultimately individual impact. While this call for research was in an era of internally focused information systems, it would follow that consumer-focused B2C systems should also be subject to joint effects. In a non-IS environment, an examination of product attributes jointly with service quality suggested that product dimensions had more of an effect on customers’ perceptions than did service quality (Genestre & Herbig 1996). Similarly, an examination of an IS department provided evidence that the quality of the information product provided had a greater effect than any service quality dimension assessed using the SERVQUAL instrument (Kettinger & Lee 1995). Therefore, research should not be focused solely on service quality. Exploration of expectation-perception gaps among the respective dimensions of information service quality and information quality as well as the effect size of these dimensions within a single study appears to be a useful endeavor. As this research in progress continues, much work remains to refine the conceptual model and validate the proposed instrument.

Service quality as it has been conceived in the marketing literature differs significantly from a conceptualization of service quality in an electronic commerce environment. The quality of information and its presentation must overcome the lack of personal involvement on the part of a company’s salespeople. Information product quality is also different in its conceptualization in electronic commerce than in other IS settings because the people relying on the information in electronic commerce are external rather than internal consumers or users. While security may consider aspects of access such as password protection or which employee is allowed into which database in a more traditional IS setting, security in a B2C environment looks at whether customers feel that their private financial information will remain secure and private if given out over the Internet to a business.

There appears to be overlap in the dimensions of service quality and information product quality. Because of the overlap we expect the dimensions of web site quality to collapse into fewer than nine dimensions. This research will allow us to determine what lower-order constructs compose website quality and the relative importance of those constructs.

**Conclusions and Future Research**

The development and assessment of an instrument for measuring factors affecting quality can enhance future research in the area of electronic commerce and provide industry practitioners with a diagnostic tool and feedback mechanism to aid in the identification of gaps between consumer website expectations and perceptions. Research needs to be conducted to examine the dimensions included in both information product quality and service quality to determine their relevance and relative importance in measuring B2C website quality. The proposed instrument, SITEQUAL, will help serve to identify key dimensions of website quality, integrating measures of both information quality and service quality. To determine the validity of the SITEQUAL instrument, survey-based data will be collected from a sample of B2C users in selected industries. The survey will include personal demographics, measures of service quality, information quality, and an overall measure of website satisfaction modified from existing instruments and frameworks for use in the B2C environment. The analysis of the data will be conducted in two stages. The first stage will focus on condensing the SITEQUAL instrument, retaining only items capable of discriminating well across respondents having different quality perceptions and examining the dimensionality of the scale. The second analysis will examine the effects of the dimensions identified by SITEQUAL to determine its ability to predict overall user satisfaction with the website.
While electronic commerce is still in its infancy there have already been significant failures. The development of high quality B2C information products and services is an important issue addressed through the development of a model for understanding consumer perceptions and expectations that lays the foundation for the development of a validated measurement instrument. Identification of expectation-perception gaps may be used to better understand user requirements, aid in the development of B2C systems specifications, focus testing efforts, and evaluate potential modifications to existing B2C website designs and operations. This model focuses future research on extending the knowledge of quality dimensions affecting B2C websites and calls for providing both researchers and practitioners with a tool to aid both academic research and the industrial development of B2C systems.

References


