Service Quality Delivery Through Web Sites: A Critical Review of Extant Knowledge

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Evidence exists that service quality delivery through Web sites is an essential strategy to success, possibly more important than low price and Web presence. To deliver superior service quality, managers of companies with Web presences must first understand how customers perceive and evaluate online customer service. Information on this topic is beginning to emerge from both academic and practitioner sources, but this information has not yet been examined as a whole. The goals of this article are to review and synthesize the literature about service quality delivery through Web sites, describe what is known about the topic, and develop an agenda for needed research.

> In the offline world . . . 30% of a company's resources are spent providing a good customer experience and 70% goes to marketing. But online . . . 70% should be devoted to creating a great customer experience and 30% should be spent on "shouting" about it.
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> —Jeff Bezos, Amazon.com
> (*Business Week*, March 22, 1999, p. EB30)

In e-tailing's nascent days, Web presence and low price were believed to be the drivers of success. However, no amount of presence or low price could make up for the service quality issues that became all too prevalent: consumers could not complete transactions, products were not delivered on time or at all, e-mails were not answered, and desired information could not be accessed. Electronic service quality then entered the picture as a differentiating strategy. To encourage repeat purchases and build customer loyalty, companies needed to shift the focus of e-business from e-commerce (the transactions) to e-service (all cues and encounters that occur before, during, and after the transactions).

To do so and thereby deliver superior service quality, managers of companies with Web presences must first understand how customers perceive and evaluate online customer service. This involves defining what e-service quality (e-SQ) is, identifying its underlying dimensions, and determining how it can be conceptualized and measured.

While both business and academic researchers have begun to conceptualize and measure electronic service quality, most do not provide definitions of domains. For that reason, some differences exist in the meaning of Web site service quality. Some researchers (such as Lociacono, Watson, and Goodhue 2000) focus their operationalizations on the technical quality of the Web site itself rather than the service quality provided to customers through the Web

site. Some conceptualizations are limited to the interactions with the site itself, while others include the post–Web site services of fulfillment and returns. The first formal definition of Web site service quality, or e-SQ, was provided by Zeithaml, Parasuraman, and Malhotra (2000). In their terms, e-SQ can be defined as the extent to which a Web site facilitates efficient and effective shopping, purchasing, and delivery of products and services (Zeithaml et al. 2000). As can be observed in this definition, the meaning of *service* is comprehensive and includes both pre– and post–Web site service aspects. The objectives of this article are to

1. review and synthesize the literature about how consumers perceive service quality delivery though Web sites,
2. describe what we know and do not know about service quality delivered through Web sites,
3. develop an agenda for future research to bridge the gaps in our knowledge.

To achieve these objectives, we first discuss the conceptualization of service quality delivery in the literature, including the major criteria that consumers use to evaluate service quality. Next, we describe the way that academic and practitioner researchers have measured electronic service quality. We then compare the assessment of e-SQ with traditional service quality from both the customer's and the organization's perspective. Finally, we evaluate what we know and do not know about e-SQ, focusing on the research that is needed to learn more about it.

CONCEPTUALIZATION OF SERVICE QUALITY DELIVERY THROUGH WEB SITES

Criteria Customers Use in Evaluating e-SQ

Academic research has identified a number of criteria that customers use in evaluating Web sites in general and service quality delivery through Web sites in particular. These include (1) information availability and content, (2) ease of use or usability, (3) privacy/security, (4) graphic style, and (5) fulfillment. A number of studies have examined various aspects of these criteria and will be reviewed below. It is important to note that when purchasing items online, customers are typically goal oriented and that entertainment-related criteria associated with online use in general (such as flow and other experiential aspects) are not relevant when the context is purchase.

Information availability and content. The availability and depth of information are frequently mentioned as an important reason for shopping online (Li, Kuo, and Russell 1999; Swaminathan, Lepkowska-White, and Rao 1999;

Van den Poel and Leunis 1999; Wolfinbarger and Gilly 2001; Zellweger 1997). In terms of shopping online versus offline, online buyers perceive a benefit in obtaining information directly from a site rather than having to go through salespeople in an offline store. They also believe that they obtain more information online than through catalog shopping (Van Den Poel and Leunis 1999), partly because their questions can be answered in the online channel (Ariely 2000; Venkatesh 1998). The reduction in search costs for products and product-related information has been identified as one of the key benefits of online shopping (Alba et al. 1997; Ariely 2000; Bakos 1997; Lynch and Ariely 2000). When used as criteria for a particular Web site, having sufficient information to compare products and to make a selection appear to be important factors.

In terms of information content, the ability to search price and quality information increases satisfaction with both the experience and product purchased and improves intentions to revisit and repurchase from a Web site (Lynch and Ariely 2000). Furthermore, when users can control the content, order, and duration (the amount of time the information is present) of product-relevant information, their ability to integrate, remember, and thereby use information is improved (Ariely 2000).

Ease of use. Given that Internet-based transactions might seem complex and intimidating to many customers, it is reasonable to expect the ease of use (EOU) of Web sites to be an important determinant of perceived e-SQ. Formal research on EOU of Web sites is sparse, but the construct has been studied extensively in the context of technology adoption in workplace environments. Studies dealing with employees' adoption of software products (e.g., word-processing packages) have examined the effect of perceived EOU and perceived usefulness (U) on the potential adopters' attitudes, behavioral intentions, and actual behavior. The initial research in this line of inquiry (Davis 1989; Davis, Bagozzi, and Warshaw 1989) developed scales to measure perceived EOU, defined as "the degree to which the prospective user expects the target system to be free of effort," and perceived U, defined as "the prospective user's subjective probability that using a specific application system will increase his or her job performance" (Davis et al. 1989:985). This research also empirically demonstrated the impact of the two constructs on attitudes, intentions, and behavior and discovered a differential impact of EOU and U, with U being a stronger predictor of the dependent variables than was EOU. Several replication studies (Adams, Nelson, and Todd 1992; Hendrickson, Massey, and Cronan 1993; Keil, Beranek, and Konsynski 1995; Segars and Grover 1993; Subramanian 1994) have confirmed these relationships and also suggested customer and task characteristics as potential moderators of the relationships. The consensus from this research stream highlights the importance of

both EOU and U in the adoption of new technologies and, to the extent that online shopping can be considered akin to using a new technology, suggests that customers' assessment of Web sites will likely be influenced by how easy the sites are to use and how effective they are in helping customers accomplish their tasks. However, since the research to date on EOU and U focuses on the adoption of workplace technologies, whether specific findings from that research will generalize to the assessment of Web sites needs to be examined through Web site–specific research. For instance, one could argue that EOU might be as or more important than U when consumers evaluate the quality of service delivered by Web sites.

Ease of use has often been termed *usability* in the online context (Swaminathan et al. 1999). A site's search functions, download speed, overall design, and organization are among the key elements that affect usability (Jarvenpaa and Todd 1997; Lohse and Spiller 1998; Montoya-Weiss, Voss, and Grewal 2000; Nielsen 2000; Novak, Hoffman, and Yung 2000; Spiller and Lohse 1997-1998). Ease of use and perceived channel advantage have been shown to predict adoption of Internet financial services (Montoya-Weiss et al. 2000).

Privacy/Security. Privacy and security are key evaluative criteria in online services (Culnan 1999; Culnan and Armstrong 1999; Hoffman, Novak, and Peralta 1999; Montoya-Weiss et al. 2000; Quelch and Klein 1996). These two related criteria have been distinguished from each other. Privacy involves the protection of personal information—not sharing personal information collected about consumers with other sites (as in selling lists), protecting anonymity, and providing informed consent (Friedman, Kahn, and Howe 2000). Security, on the other hand, involves protecting users from the risk of fraud and financial loss from the use of their credit card or other financial information. Security risk perceptions have been shown to have a strong impact on attitude toward use of online financial services (Montoya-Weiss et al. 2000).

Graphic style. Researchers have studied the impact that graphic style of the site has on customer perceptions of online shopping (Ariely 2000; Hoffman and Novak 1996; Hoque and Lohse 1999; Lynch and Ariely 2000; Montoya-Weiss et al. 2000; Novak et al. 2000; Schlosser and Kanfer 1999). Graphic style involves such issues as color, layout, print size and type, number of photographs and graphics, and animation.

Fulfillment/reliability. The dominant dimension in traditional service quality, reliability, has also been cited as an important factor in e-SQ (Palmer, Bailey, and Faraj 1999; Wolfinbarger and Gilly 2002). In fact, Wolfinbarger and Gilly (2002) found that reliability/fulfillment ratings were the strongest predictor of customer satisfaction and quality and the second strongest predictor of loyalty/intentions to repurchase at a site. In the offline context, reliability is defined as the "ability to perform the promised service dependably and accurately" (Parasuraman, Zeithaml, and Berry 1988:23). This translates online into on-time and accurate delivery, accurate product representation, and other fulfillment issues. While previous research has not documented other meanings, reliability may also reflect technical reliability, such as the proper functioning of the site.

Other criteria. While not researched specifically, other criteria have been mentioned in the literature in relationship with online service quality. These include access, responsiveness, and personalization (Mulvenna, Anand, and Buchner 2000). In an examination of top 100 U.S. retailers, Griffith and Krampf (1998) found that access and responsiveness of the Web site were key indicators of service quality delivered through the Web. In their study, access was operationalized as the provision of a hot-linked e-mail address and telephone number of customer service agents. Other studies have operationalized access as the presence of addresses, e-mail addresses, or telephone numbers to contact customer service agents. Responsiveness was measured by the promptness with which the e-tailer responded to e-mails.

MEASUREMENT OF SERVICE QUALITY DELIVERY THROUGH WEB SITES

Measurement of service quality delivery through Web sites is in its early stages. The overwhelming majority of measurement scales have been developed in business, either by individual companies or by consulting firms that sell the scales to businesses. The published scholarly literature is minimal in terms of articles dealing directly with measuring how customers assess electronic service quality (e-SQ).

Some measures of e-SQ are ad hoc and include only a few factors. Rice (1997), for example, surveyed visitors to 87 Web sites to determine factors that would induce revisit. His measures included (1) good content/information, which was the primary driver of revisit, and (2) enjoyable experience on the first visit, which was the second most important driver. In a more comprehensive framework, Liu and Arnett (2000) surveyed Webmasters for *Fortune* 1000 companies to ascertain the factors critical to Web site success with consumers. Five factors or dimensions were measured and found to be key. First, quality of information consists of relevant, accurate, timely, customized, complete information presentation. Service, the second factor, involves quick response, assurance, empathy, and follow-up. Third, system use includes security, correct

transaction, customer control on transaction, order-tracking facility, and privacy. Fourth, playfulness perceived by consumers is determined by customers' sense of enjoyment, interactivity, attractive features, and enabling customer concentration. Finally, design of the Web site system/interface involves organized hyperlinks, customized search functions, speed of access, and ease of correcting errors.

In their examination of Internet pharmacies, Yang, Peterson, and Huang (2001) identified and measured six dimensions of consumer perceptions of service quality: (1) ease of use, which includes user friendliness, loading/ transaction speed, search capability, and easy navigation; (2) content contained on the Web site, particularly information that matches the needs of the consumer; (3) accuracy of content; (4) timeliness of response; (5) aesthetics, involving attractiveness of the site and catalog pictures; and (6) privacy. The measurement of e-SQ in these research studies is rather arbitrary, to the extent that the scales and dimensions used to measure e-SQ have not been empirically validated. Many of the dimensions and measures used have been picked out from studies on service quality in the physical retail arena or have been derived from human-computer interface literature. By doing so, these research studies may not elicit the comprehensive dimensionality of e-SQ.

Several businesses have developed their own methodologies to measure service quality provided by online retailers. BizRate.com's scale is the most widely cited scale in popular literature. Using consumers as evaluators of sites in diverse categories (e.g., CDs, books, toys, and apparel) after they have made purchases, the scale identifies the strengths and weaknesses of individual sites. The BizRate scale has 10 dimensions: ease of ordering, product selection, product information, price, Web site performance, on-time delivery, product representation, customer support, privacy policies, and shipping and handling. In addition to using customers' perceptions of e-tailers along the 10 dimensions, BizRate researchers also measure the availability of features and service at each retailer's Web site in terms of ordering methods (online, e-mail, telephone, fax, toll-free phone), delivery methods (e.g., immediate, priority next day, standard next-day air), payment methods (e.g., American Express, Diners Club), and special features (customer information always confidential, customer information confidential by request, live customer help, available 24 hours a day, online order-tracking system, online ordering shopping cart, secure ordering/ payment, search on site, you must register, gift services, one-click ordering, guaranteed security). Research using BizRate data has shown that the key driver of intent to return to the site is customer support, and the least important is price.

Gomez.com provides an alternative evaluation system that uses researchers rather than consumers to evaluate sites. The company's researchers measure the performance of the site and assign ratings based on whether various criteria are satisfied. Measurement involves direct examination of the Web site, performance monitoring of various pages on the site, pricing transactions, mock transactions (account opening), interaction with customer service representatives, and a questionnaire filled out by each company. The index obtained from this procedure is then multiplied by the importance profile of a customer (i.e., how would a serious shopper rate the importance of each of the criteria that are objectively measured by Gomez?). The categories measured by Gomez are broadly classified into the following:

- ease of use (functionality of the Web site, consistency of design and navigation, smoothness of interactions),
- efficient access to information (signifying back-end integration of data),
- customer confidence (breadth and depth of customer service options, including channels of interactions, promptness and accuracy of e-mail response, privacy policies, guarantees),
- reliability (load times and security),
- years the Web site or company has been in business,
- on-site resources (availability of products, availability of online response to requests, detailed information on each product line),
- relationship services (online help/tutorials, recommendations, personalization of information, reuse of customer information to facilitate future interactions, incentive programs), and
- overall cost (total cost of ownership of typical offering baskets, added fees for shipping and handling, minimum balances and interest rates—for financial services companies).

CIO.com's Cyber Behavior Research Center has also created a survey to measure the quality of service provided by e-tailers on the Web. It measures the following items: problems experienced while placing an order, problems experienced after placing an order (e.g., delivery of wrong item to the doorstep), ability to contact customer service representative online while placing an order, and ability to contact customer service after placing an order. Another survey by CIO.com focuses only on the ease of navigation and consists of the following items: (1) Is concise/direct navigation on a Web site important to you? (2) Given the type of site you most often visit, what type of overall Web site navigation design do you most often prefer? (3) How well do you feel you are able to use a search engine to find what you are looking for?

Some academic researchers have started to establish comprehensive e-SQ scales based on more rigorous empirical testing. Lociacono et al. (2000) established a

scale called WEBQUAL with 12 dimensions: informational fit to task, interaction, trust, response time, design, intuitiveness, visual appeal, innovativeness, flow (emotional appeal), integrated communication, business processes, and substitutability. *Informational fit to task* includes appropriateness of information, quality of information, and presentation of information. *Interactivity* is the extent to which Web site users can (1) communicate with the people behind the Web site, (2) interactively search for information, and (3) conduct transactions through the Web site. Maintaining the privacy of information provided by the Web site users is an important determinant of the *trust* dimension. *Response time* is the time it takes for the Web page to load in a user's browser and also the time required to complete subsequent transactions. *Design appeal* involves the aesthetics of the Web site, including information organization and navigability. *Intuitiveness* refers to the ability of site users to grasp easily how to move around the Web site. *Visual appeal* refers to the presentation of graphics and text on the site. *Innovativeness* is the "aha" (surprise) element associated with the Web site, including its creativity and uniqueness. If the use of the site results in an enjoyable and engrossing experience for the users, it addresses the *flow* dimension of WEBQUAL. *Integrated communication* involves the seamlessness of communicating with retailers through multiple channels. Selling or communicating through the Web site demands that the designers think of how the Web site fits with the overall business process. The *business process* dimension measures the complementarity of the Web strategy with the general business strategy. Finally, *substitutability* is the measure of the effectiveness of Web site interaction compared to other means such as physical stores.

Overall, the WEBQUAL scale is geared toward helping Web site designers to better design Web sites to affect the interaction perceptions of the users. Therefore, the scale is more pertinent to interface design rather than service quality measurement. In fact, a dimension called customer service was eliminated from the scale for various methodological reasons. Specifically, customer service could not be measured because the survey was conducted with students visiting Web sites to evaluate them rather than with actual purchasers. For the same reason, WEBQUAL does not include fulfillment as a dimension. WEBQUAL, therefore, is not a scale that captures service quality fully. Other issues that relate to WEBQUAL include the fact that the authors did not model overall quality; they simply correlated their factors with overall quality. They also had their sample of students use researcher-specified categories in the categorization stage rather than letting those categories emerge through qualitative study.

Wolfinbarger and Gilly (2002) used online and offline focus groups, a sorting task, and an online survey of a customer panel to develop a scale called .comQ. The scale contains four factors: *Web site design* (involving the expected attributes associated with design as well as an item dealing with personalization), *reliability* (involving accurate representation of the product, on-time delivery, and accurate orders), *privacy/security* (feeling safe and trusting of the site), and *customer service* (combining interest in solving problems, willingness of personnel to help and prompt answers to inquiries). Using concepts and attributes from both the service quality and retailing literatures, their scale contains 14 attributes in these four factors.

Using an online survey, Szymanski and Hise (2000) studied the role that consumer perceptions of *online convenience, merchandising* (product offerings and product information), *site design*, and *financial security* play in e-satisfaction assessments. This study did not include aspects of customer service or fulfillment and dealt with satisfaction rather than service quality.

Zeithaml, Parasuraman, and Malhotra (2000, 2002) developed e-SERVQUAL for measuring e-service quality through a three-stage process using exploratory focus groups and two phases of empirical data collection and analysis. This process produced seven dimensions—efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact—that form a core service scale and a recovery service scale. Four dimensions—efficiency, reliability, fulfillment, and privacy—form the core e-SERVQUAL scale that is used to measure the customers' perceptions of service quality delivered by online retailers. These dimensions include the criteria customers use to evaluate routine online service when they experience no questions or problems in using the site. *Efficiency* refers to the ability of the customers to get to the Web site, find their desired product and information associated with it, and check out with minimal effort. *Fulfillment* incorporates accuracy of service promises, having products in stock, and delivering the products in the promised time. *Reliability* is associated with the technical functioning of the site, particularly the extent to which it is available and functioning properly. The *privacy* dimension includes assurance that shopping behavior data are not shared and that credit card information is secure.

Zeithaml et al. (2002) also found that three dimensions become salient only when the online customers have questions or run into problems—responsiveness, compensation, and contact. These dimensions have been conceptualized as constituting a recovery e-SERVQUAL scale. *Responsiveness* measures the ability of e-tailers to provide appropriate information to customers when a problem occurs, have mechanisms for handling returns, and provide online guarantees. *Compensation* is the dimension that involves receiving money back and returning shipping and handling costs. The *contact* dimension of the recovery e-SERVQUAL scale points to the need of customers to be

able to speak to a live customer service agent online or through the phone—requiring seamless multiple channel capabilities on the part of e-tailers.

CUSTOMER ASSESSMENT OF TRADITIONAL SQ VERSUS e-SQ

A comparison of the way consumers evaluate SQ and e-SQ reveals differences in the role of expectations, number and nature of dimensions, and cognitive-emotional content. In addition, there seems to be a greater degree of consumer trade-offs and hence curvilinearity along e-SQ dimensions than in the case of SQ.

Expectations

Evidence exists that expectations are not as well formed in e-SQ as they are in SQ. Focus group participants in the Zeithaml et al. (2000) study of e-SQ reportedly seemed at a loss to articulate their e-SQ expectations except when it came to issues of order fulfillment. Respondents were able to express their expectations about reliability issues such as having items in stock, delivering what is ordered, delivering when promised, and billing accuracy. However, they had difficulty expressing expectations about other dimensions. This difficulty is consistent with a key conclusion reached by Mick and Fournier (1995, 1998) based on their in-depth probing of consumer reactions to new technologies: "In buying and owning technological products, an individual's pre-consumption standards are often nonexistent, weak, inaccurate, or subject to change as life circumstances shift" (Mick and Fournier 1995:1).

Equivalence of Dimensions and Perceptual Attributes for SQ and e-SQ

In comparing the dimensions of SERVQUAL (Zeithaml, Parasuraman, and Berry 1990) and the dimensions that participants discussed in focus groups preceding the development of e-SERVQUAL (Zeithaml et al. 2000), several observations can be made. First, approximately half of the dimensions of SERVQUAL (reflected both in the original 10-dimension conceptualization and in the five SERVQUAL factors identified empirically in subsequent research) (Parasuraman, Zeithaml, and Berry 1985, 1988) are also used by consumers when they evaluate e-SQ. Second, several new dimensions emerged as important in assessing e-SQ. Third, perceptual attributes related to the dimensions of the e-SERVQUAL and SERVQUAL scales tend to differ more than the dimensions themselves.

Participants in the e-SQ focus groups discussed the themes of reliability, responsiveness, access, assurance, and customization/personalization frequently, and these were also key dimensions or subdimensions of SERVQUAL. Many of the perceptual attributes pertaining to Web site service quality remain the same as in SERVQUAL—honoring promises, being available when the customer wants to do business, having a reputable name, and knowing customers. However, some of the perceptual attributes of reliability and access dealt with online-specific issues such as system crashes and operation and availability of the network—attributes not present in SERVQUAL.

Several of the dimensions or subdimensions of e-SERVQUAL are new, including ease of navigation, flexibility, efficiency, site aesthetics, and security. Most, but not all, new dimensions relate specifically to technology. Ease of navigation, for example, involves having functions that help customers find what they need without difficulty and possessing a good search engine.

Personalization Versus Personal Service (Empathy)

Personal service (the empathy dimension of SERVQUAL) is not critical in the transactional aspects of online service (i.e., the dimensions captured by the core e-SERVQUAL scale). While customers seek understanding, reassurance, courtesy, and other aspects of personal attention in offline contexts, these service requirements did not seem to be key issues in perceived e-SQ. Only in service recovery or in highly complex decisions, when customers sought special assistance (often on the telephone as follow-up), did aspects of personal service appear to be considered. The personal (i.e., friendly, empathetic, understanding) flavor of SERVQUAL's empathy dimension is not required except when customers experience problems. Many focus group participants were only interested in having efficient transactions.

Compared to customers' assessment of SQ, e-SQ seems to be a more cognitive evaluation than an emotional one. Purchasing online appears to be a very goal-directed behavior. While emotions such as anger and frustration were expressed when reporting on problems arising from online transactions, these appeared to be less intense than those associated with traditional service encounters (see Zeithaml et al. 2000). Moreover, positive feelings of warmth or attachment that are engendered in SQ situations did not surface in the focus groups as being characteristics of e-SQ experiences.

Curvilinear Relationships

For most (but not all) traditional service quality attributes, more of an attribute was typically better than less. For instance, most customers wanted as much empathy and assurance as they could obtain during offline service transactions. In contrast, several of the expressed attributes of

e-SQ involved ideal points that varied among customers. In other words, inverted U-shaped relationships, rather than linear relationships, appeared to exist between performance and perceived e-SQ on those attributes.

For example, customers wanted responsiveness in terms of e-mails sent to them about products and services ordered. Once an order had been placed, customers expected confirmation of the specifics of the order on the Web site and through e-mail. At a later point in the order fulfillment process, they also appreciated a follow-up e-mail when the order was shipped or delayed. There existed a point, however, at which there was too much e-mail being sent.

Personalization is another attribute on which desires vary across customers. Many Web sites ask customers to provide preference information to personalize the look and feel of the site for individual customers. To this end, customers are typically asked to provide detailed shipping, billing, and credit card information. For some participants, personalization enhanced perceived e-SQ, but for other participants who only wanted to buy items and check out quickly, the personalization decreased e-SQ perceptions.

A final example of the curvilinear pattern involved the amount of information and graphics presented on a site. Some respondents wanted a large amount of information and high-quality graphics to make their choices. They desired multiple images to view the product from several angles or three-dimensional, rotating renderings of products. However, other respondents preferred simplicity in both information and graphics, in part because their presence slowed down the transaction and in part because too much information became confusing.

TRADITIONAL SQ VERSUS e-SQ FROM THE ORGANIZATION'S PERSPECTIVE

Zeithaml et al.'s (2000) exploratory study on e-service quality, in addition to facilitating the comparative discussion of customer assessments of SQ versus e-SQ, provided insight into organizational deficiencies likely to contribute to poor e-SQ. As we discuss below, organizational shortfalls similar to those that have been identified in the extant SQ literature are likely to be present in the context of companies designing and operating Web sites.

A conceptual model of SQ developed by Parasuraman et al. (1985) defines customer-perceived SQ as the magnitude and direction of the discrepancy between service expectations and perceptions and depicts this discrepancy as a function of four organizational gaps associated with the design, marketing, and delivery of services:
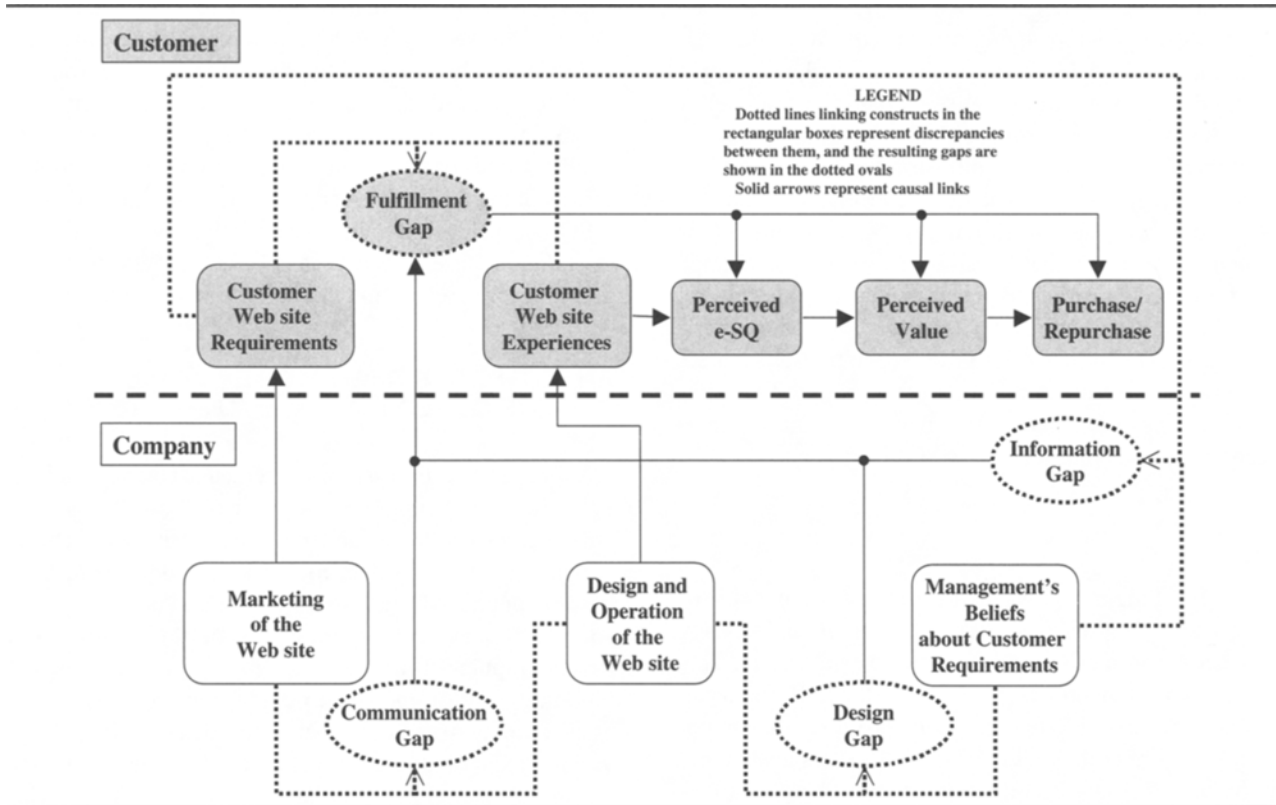
Gap 1: Difference between customer expectations and management perceptions of customer expectations
Gap 2: Difference between management perceptions of customer expectations and SQ specifications
Gap 3: Difference between SQ specifications and the service actually delivered
Gap 4: Difference between service delivery and what is communicated about the service to consumers

Although the above gaps were identified in the context of traditional SQ, Zeithaml et al.'s (2000) exploratory research indicated the presence of similar shortfalls in companies interacting with their customers through the Internet. Figure 1 presents a conceptual model that brings together in a common framework the following: (1) customer assessment of e-SQ and its consequences (top half of the model) and (2) organizational deficiencies that could contribute to poor assessment of e-SQ (bottom half of the model). The company side shows three potential disconnects—depicted as the information, design, and communication gaps—that can occur in the process of designing, operating, and marketing Web sites. These gaps collectively contribute to the "fulfillment gap" on the customer's side, triggering a chain of adverse effects on perceived e-SQ, perceived value, and purchase/repurchase behavior.

What a company—in particular, the group of managers responsible for guiding Web site design and operations—believes to be an ideal Web site for its target market might be incomplete or inaccurate because of insufficient or incorrect information about Web site features desired by customers. The information gap represents the discrepancy between customers' requirements concerning a Web site and management's beliefs about those requirements. For instance, management might overestimate the importance of including sophisticated, three-dimensional graphics, which could undermine transaction efficiency, an attribute that customers might consider to be far more critical than site attractiveness.

The significance of the information gap in the context of e-SQ is heightened by the fact that customers are likely to desire an optimal level of performance that is neither too high nor too low on some Web site attributes. As discussed earlier, even for attributes such as response speed and provision of order status information, "more" may not always translate into higher perceived e-SQ. Furthermore, the optimum performance level on any given attribute might also vary across customers (e.g., experienced vs. inexperienced customers; customers who are just browsing vs. those who are ready to buy) and contexts (e.g., purchase of rare vs. readily available items; a normal vs. a problem-plagued transaction). In the absence of regular monitoring

of the marketplace to update the company's knowledge about Web site attributes desired by customers, some degree of information gap will persist.

Design Gap

The initial design of a Web site should be informed by the company's knowledge about features desired by customers. Likewise, the ongoing operations of the Web site should undergo appropriate adjustments in response to customer feedback. Unfortunately, even when a company's management has complete and accurate knowledge (i.e., the information gap is absent), this knowledge may not always be reflected in the site's design and functioning. The design gap represents the failure to fully incorporate knowledge about customer requirements into the structure and functioning of the Web site. As an example, management might be aware that their customers expect to receive prompt personal support when a problem arises with an e-transaction. Yet, for a variety of reasons (e.g., perceived lack of resources or a propensity to view customers as being unreasonable), management might fail to act on their awareness and initiate appropriate Web site

modifications. Existing literature on organizational deficiencies that lead to poor SQ (e.g., Zeithaml, Berry, and Parasuraman 1988) offers at least indirect evidence of the presence of the design gap in e-companies.

Communication Gap

This gap reflects a lack of accurate understanding on the part of marketing personnel about a Web site's features, capabilities, and limitations. Under the ideal scenario, the marketing of the Web site will be based on sound knowledge about what it can and cannot offer, with those responsible for designing and operating the Web site communicating regularly with marketing personnel to ensure that promises do not exceed what is possible. The lack of effective communication between marketing and operations documented in traditional SQ contexts (Parasuraman et al. 1985; Zeithaml et al. 1988) is likely to be present in e-SQ contexts as well. In fact, because of the increasing competitive intensity in the e-commerce arena, with rival players seemingly ready to do whatever it takes to stake a claim in it, the propensity for e-marketing to ignore the reality of Web site capabilities might be even higher.

The communication gap represents more than just inaccurate or inflated promises about a Web site made through traditional media such as print and television. It also includes such promises being made on the Web site itself (e.g., guaranteed delivery of purchased merchandise by a certain date), apparently because marketing personnel or systems making those promises lack—or ignore—knowledge about shortfalls in the infrastructure underlying the Web site. Regardless of whether the erroneous promises are made through traditional promotional media or through the Web site, they constitute a form of "marketing" that influences customers' requirements or expectations from the site (see Figure 1). Customers' Web site experiences (driven by the site's design and operation, as Figure 1 shows) falling short of their marketing-induced requirements are an external manifestation of the internal communication gap and contribute to the "fulfillment gap."

Fulfillment Gap

The fulfillment gap, occurring on the customer side of the model in Figure 1, represents the *overall* discrepancy between a customer's requirements and experiences. This gap has two distinct forms. One form of the fulfillment gap occurs because of inflated marketing promises that do not accurately reflect the reality of the Web site's design and operation—that is, the communication gap (e.g., marketing promises a "money-back guarantee" when, in fact, the Web site lacks the back-end infrastructure to receive and process complaints from dissatisfied customers). Another facet of the fulfillment gap is the frustration that e-shoppers might experience even in the absence of external promises. Shortfalls such as a customer's inability to complete an e-purchase transaction are also manifestations of the fulfillment gap in that they reflect unfulfilled customer desires. These kinds of customer frustrations are not a result of exaggerated external promises but rather are due to deficiencies in the design and operation of the Web site in terms of their failure to fully incorporate customers' desires. This type of fulfillment gap stems from the cumulative effect of the information and design gaps, just as the fulfillment gap triggered by inflated promises is a consequence of the communication gap. Thus, as Figure 1 shows, the overall fulfillment gap stems from a combination of the information, design, and communication gaps.

On the customer side of Figure 1, the fulfillment gap and customer experiences are both shown as key determinants of perceived e-SQ. While the fulfillment gap indirectly captures customer experiences, some experiences (e.g., pleasant surprises involving Web site attributes that a customer may not even have thought about) will have a direct effect on perceived e-SQ as well. Perceived value,

which results from the trade-off between the benefits received and sacrifices endured by customers (Zeithaml 1988), is next in the chain of dependent constructs in Figure 1, followed by purchase/repurchase behavior. The links from perceived e-SQ to perceived value and from the latter to purchase/repurchase behavior are consistent with the extensive extant conceptual and empirical work on the quality-value-loyalty chain. In addition to the indirect effects of the fulfillment gap (mediated through perceived e-SQ and perceived value) on perceived value and purchase/repurchase, Figure 1 also posits direct effects that are subject to verification through future research.

ANTECEDENTS OF WEB SITE SERVICE QUALITY

As our earlier discussion of criteria that customers use in evaluating e-SQ suggests, a number of Web site–specific attributes such as layout and navigation influence Web site service quality. However, to our knowledge, there have been no published studies on whether and how customer-specific characteristics such as demographics and psychographics influence e-SQ. Virtually all of the extant literature on customer-specific attributes focuses on the association between customers' attitudes or beliefs about various technologies and technology-related behaviors. For instance, a series of studies by Cowles (1989; Cowles and Crosby 1990) about interactive media suggest that customers can be segmented based on how they perceive the media and that the resulting segments differ significantly in terms of acceptance of the media. Similar links between customers' beliefs about technology-based transactions and their propensities to engage in such transactions have been found in studies involving interactive teleshopping (Eastlick 1996) and technology-based self-service options (Dabholkar 1996).

One customer-specific construct that is especially relevant for understanding Web-based behaviors is *technology readiness*, defined as "people's propensity to embrace and use new technologies for accomplishing goals in home life and at work" (Parasuraman 2000:308). Technology readiness has four underlying dimensions: optimism (a positive view of technology and a belief that it offers people increased control, flexibility, and efficiency), innovativeness (a tendency to be a technology pioneer and thought leader), discomfort (a perceived lack of control over technology and a feeling of being overwhelmed by it), and insecurity (distrust of technology and skepticism about its ability to work properly). While optimism and innovativeness are contributors to technology readiness, discomfort and insecurity are inhibitors. A multiple-item, four-dimensional measure of this construct—called the Technology Readiness Index

(TRI)—has been developed and tested through a series of qualitative and empirical studies (Parasuraman 2000).

One proprietary study dealing with Internet service providers (ISPs) that measured customers' technology readiness as well as their perceptions of the ISPs' service quality found a positive correlation between the two (Parasuraman and Colby 1997). Other research has demonstrated the presence of distinct customer segments that have unique technology readiness profiles and also differ significantly in terms of psychographics, demographics, and various Internet-related behaviors (Parasuraman and Colby 2001).

In summary, empirical evidence from several studies suggests a strong association between customers' technology readiness and Web behaviors, which seem to be correlated with customers' demographics and psychographics. However, with the exception of the aforementioned proprietary study, which found a positive association between technology readiness and e-SQ, no research has examined the direct impact of customer-specific attributes on e-SQ and their mediated impact on Web behavior.

CONSEQUENCES OF WEB SITE SERVICE QUALITY

Scant research has identified the consequences of Web site service quality delivery. Wolfinbarger and Gilly (2002) found that different dimensions of their measure of e-SQ (called .comQ) have varying effects on the consequences. For example, they found that (1) reliability/ fulfillment ratings are the strongest predictor of customer satisfaction, (2) Web site functionality ratings are the strongest predictor of loyalty/intentions to purchase, and (3) customer service ratings predict loyalty/intentions to repurchase and customer satisfaction but not as strongly as do fulfillment and Web site design. Chen and Wells (1999) studied a concept called attitude toward the site, which involved measures including Web site relationship building, intentions to revisit, satisfaction with service, comfort in surfing, and judgment that surfing the Web site is a good way to spend time. The most prevalent type of research on consequences of Web site service quality is business research that identifies the reasons for abandoning shopping carts online, including comparison shopping/ browsing (61%), total cost of items too high (43%), checkout process too long (41%), and checkout requires too much personal information (35%) (see Vividence at www.vividence.com). BizRate conducted a study about why e-shoppers come back by examining the correlation between online shoppers' ratings of merchants in selected categories and their likelihood to buy again from the same site. The study found that while the customer service and on-time delivery have high correlations with likelihood to buy again, Web site looks and product price have low correlations (Hanrahan 1999).

SYNTHESIS: WHAT WE KNOW

The study of service quality delivery through Web sites is in its early stages. What we know is minimal but includes four points.

First, we know that electronic service quality is not unidimensional but instead is multifaceted, including dimensions such as ease of use, privacy/confidentiality, reliability, and site design. Different dimensions have been proposed, some of them ad hoc and anecdotal, yet some of them beginning to be researched more systematically. As yet, there is no consensus on the component dimensions, but frequently occurring dimensions include fulfillment, privacy/security, site design, efficiency, and ease of use.

Second, it appears that recovery service involves different dimensions than core dimensions and that most of the "personal service" issues are part of recovery service rather than core service. For instance, issues of contact and compensation seem relevant most often when problems and questions have occurred with consumers. In routine interactions with sites, consumers seem not to be concerned about how to contact a site, the way the company handles problems, or whether they receive compensation if problems do occur.

Third, we know that e-SQ affects satisfaction, intent to purchase, and purchase. Both behavioral and reported evidence suggests the importance of e-SQ to purchase. Most of this evidence is either anecdotal or based on surveys (such as BizRate), but there is sufficient data about abandoning sites and complaints with sites to suggest that e-SQ is a key driver of repeat purchases from Web sites.

Fourth, we know that technology readiness, a customer-specific construct, is related to perceptions of e-SQ. However, the empirical evidence in this regard is limited.

WHAT WE DO NOT KNOW: DIRECTIONS FOR FUTURE RESEARCH

Rigorous attention to the concept of service quality delivery through Web sites is needed. This would involve a comprehensive examination of the antecedents, composition, and consequences of service quality. In terms of the composition of the construct, Zeithaml et al. (2000) have suggested a means-end approach to this conceptual development whereby the overall construct of e-SQ is identified first in terms of its dimensions, then the attributes that comprise each dimension, and finally the specific concrete cues that signal each attribute. The e-SERVQUAL scale that they have developed (Zeithaml et al. 2002) is one

example of the comprehensive view of the composition of the concept. The antecedents of e-SQ are likely to be specific concrete cues—items such as one-click ordering, e-Trust symbols, and specific design features—that lead to customer perceptions of the presence of the attributes, followed by assessment of overall service quality. As we have shown, the consequences of e-SQ have not been fully developed and could therefore be conceptualized. They are likely to include intentions (such as to revisit the site, to purchase and repurchase) as well as actual behaviors (saying positive things about the site, purchase volume, revisiting, comparison shopping). A fuller understanding of e-SQ might also be obtained by linking e-SQ to related abstract, higher level concepts such as perceived value, perceived control, and perceived convenience.

Further empirical testing of e-SQ scales that currently have been developed is needed. Because BizRate has been in existence for the longest period of time, data using the scale are available and are being used in academic research. However, the reliability and validity of the BizRate scale remain to be demonstrated. All scales currently under development—including WebQual, .comQ, and e-SERVQUAL—should be examined for their psychometric properties and improved where needed.

A key managerial research question involves the degree to which a measurement scale can be created that can be used to capture service quality both in online and offline channels for the same company. Given the differences between SQ and e-SQ, this may be difficult, yet it would be valuable for managers to be able to compare their online and offline service quality.

When concepts and measures of e-SQ have been developed, we will be able to investigate questions about the importance of different dimensions and perceptual attributes to overall electronic service quality and its consequences. We know from nearly 20 years of research that reliability is the most important dimension of traditional service quality, and we need to understand which dimensions are most responsible for driving electronic service quality. Because the limited conceptual development of e-SQ suggests that reliability consists of attributes that are different from those for SQ, the importance of reliability relative to other dimensions needs to be reassessed in this context. Other trade-offs are important to investigate, such as the trade-off between e-SQ and price in contributing to perceptions of overall value, intentions to purchase, and actual purchase.

Building on the foundation of the needed research discussed above, additional research is needed to empirically study the question of where to invest in electronic service quality improvement. Should it be core or recovery service? What actions on a Web site most affect the identified key drivers of revisits or repurchase? A framework such as return on service quality (Rust, Zahorik, and Keiningham 1994) would be useful in determining where to invest.

Research is also needed to understand the effects of informational attributes of Web sites on perceptions of e-SQ. As we have discovered, one of the main dimensions of e-SQ is efficiency. The way in which information is organized on Web sites and the various mechanisms that enable customers to obtain information about products/services will greatly influence their perceptions of e-SQ. Growing use of multimedia applications is enabling innovative delivery of information by e-tailers, but it is imperative that research be conducted to determine whether there are adverse impacts on the efficiency dimension of e-SQ with the use of these innovative approaches. The technical ability to present information through innovative approaches must be weighed against their impact on e-SQ.

The impact of different *types* of information on e-SQ also needs to be investigated. For instance, online retailers such as Amazon.com offer customer and "expert" reviews of books, music, and so on and recommend other items that might be of interest to the online shopper. Likewise, using information about customer preferences on a Web site, some e-tailers offer an interface that is customized to the shopper's needs (e.g., My eBay, User's Amazon). While these types of information strategies may enhance the shopper's perceptions of personalization and search efficiency, it is also possible that they may be perceived as intrusive, unnecessary, and detracting from purchase efficiency. Research examining the potential conflicting effects of such information provision and their net impact on e-SQ perceptions, purchase behavior, and repurchase intentions will be illuminating. Such research will contribute to a finer-grained understanding of the trade-offs in customer perceptions along different dimensions of e-SQ.

A topic in great need of research is personalization/customization. When is personalization viewed as being efficient, and when is it viewed as being intrusive? What types of personalization and customization (such as receiving e-mails from the company) are seen as time-consuming, and what types (such as not needing to input information) are viewed as time saving? How do consumers respond to the different approaches to personalization and customization? Can customers distinguish among types of personalization that are based on remembering individual customer data and those that are driven by techniques to identify similarities across customers? Are these approaches drivers of e-SQ or not?

Another issue involves the way consumers judge the privacy of a Web site. Some customers appear to depend on the trust symbols (such as a key) that appear on sites, and others read privacy policies. However, two recent studies (Wolfinbarger and Gilly 2002; Zeithaml et al. 2000) found that consumers really did not know how to judge privacy with confidence and that even with these cues, they felt unsure of the privacy/security of a site. Research could be used to examine other factors (such as

brand, company reputation, appearance of the site) that convey signals of privacy that may be more meaningful.

Many e-tailers are using automated response technologies to answer e-mails from online customers experiencing problems. These technologies are beneficial from an operational standpoint in that they can reduce costs by intelligently scanning incoming e-mails and selecting the most appropriate responses from a database. They can also greatly reduce response time. However, to date, there has been no systematic examination of how customers perceive the *quality* of such automated responses in terms of their content and helpfulness. There is a need for research focusing on how the speed versus content aspects of automated responses to customer queries influence the recovery service quality of Web sites.

We know almost nothing about the demographic, behavioral, and experience correlates of e-SQ. Does age, gender, or income of customers affect their perceptions of service quality delivery through Web sites? How is experience with Web sites related? Are there other behavioral correlates that influence perceptions? All of these questions remain to be investigated.
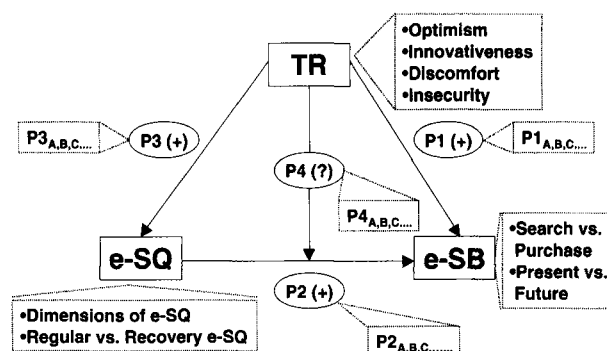
One area of research that has potential for surfacing rich insights is the examination of the interrelationships among technology readiness (TR), e-SQ, and e-shopping behavior (e-SB). Figure 2 presents a framework for guiding such an examination.

Insights from qualitative research and limited empirical findings to date suggest three propositions that need more formal and rigorous testing:

Proposition 1: Customers' TR has a positive impact on their e-SB.
Proposition 2: Customers' perceptions of e-SQ have a positive impact on their e-SB.
Proposition 3: Customers' TR has a positive impact on their perceptions of e-SQ.

In light of TR's hypothesized positive impact on both e-SQ and e-SB, exploring whether and how TR moderates the relationship between the two (Proposition 4 in Figure 2) would also be instructive. For instance, it is possible that customers high on TR are less likely to be intimidated by technical snafus and more prone to continue to use technologies despite problems than are low-TR customers; if so, the impact of e-SQ on e-SB is likely to be weaker for high-TR customers than for low-TR customers (i.e., TR may negatively moderate the influence of e-SQ on e-SB). However, if high-TR customers, by virtue of their greater knowledge of technologies, are more demanding and have higher evaluative standards, TR may have a positive moderating influence on the link between e-SQ and e-SB (i.e., the link is likely to be stronger for high-TR customers than for low-TR customers). Thus, the extent

NOTE: P1 = Proposition 1; P2 = Proposition 2; P3 = Proposition 3; P4 = Proposition 4.

and nature of TR's moderating effect are issues worthy of further research.

As Figure 2 shows, each of the three focal constructs has subfacets: TR has four underling dimensions; e-SQ also has multiple dimensions, some of which are salient for regular e-service while others are salient for recovery e-service; and e-SB can be examined from different perspectives depending on the goals and time frame of customers' Web behaviors. As such, each of the four main propositions can also be partitioned into a series of subpropositions focusing on links between different facets of the focal constructs. Theoretical work to identify subpropositions that are most meaningful, followed by empirical research to test them, will contribute to a richer, more in-depth understanding of the linkages among TR, e-SQ, and e-SB.

Another desirable avenue for research involves company studies to examine the extent and potential causes of the information, design, and communication gaps (the key contributors to the fulfillment gap) hypothesized in the conceptual model of service quality delivery through Web sites. In-depth interviews of Web designers and managers of dot.com companies would yield evidence of these gaps as well as ways that successful companies have closed them. The results could highlight the areas of focus for managers of e-commerce efforts and provide a set of recommendations for ways that companies can improve their e-SQ.

SUMMARY

The goal of this study was to assemble and synthesize what is currently known about service quality delivery through Web sites. The article began by conceptualizing

service quality delivery through Web sites, including defining the construct and discussing the criteria consumers use to evaluate e-SQ. Collectively, the extant literature suggests that e-SQ is a multidimensional construct, although the content of what constitutes e-SQ varies across studies. A summary of existing measurement efforts was included in the next section, followed by a comparison of traditional service quality and e-SQ. While some of e-SQ's dimensions are similar to those of SQ, others are entirely new or consist of new sets of attributes unique to the context of Web sites. Antecedents and consequences of the construct were described in the next section, leading to the conclusion that with the possible exception of technology readiness, only scant scholarly research is available about the determinants and effects of e-SQ. The final section included a synthesis of what is known about e-SQ and what needs to be learned through research.

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