5-2010

A Conceptual Model of Service Quality for the Information Systems Function

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ABSTRACT

This paper is motivated by the need to provide the Information Systems (IS) function with a model of service quality that is theoretically sound and conceptually complete. At present, no such model exists. This means IS researchers and practitioners are forced to use models, and associated measures, developed in other disciplines. One such measure, SERVQUAL, is commonly used although it has been shown to be an insufficient measure of IS service quality. In order to develop better measures of IS service quality, we must first have better models. In an effort to address this issue, a conceptual model of service quality for the IS function is proposed. This model draws on reference discipline research to explain the formation of service quality as the comparison of expectations and perceptions across three factors: service delivery, service product, and service environment.

Keywords

Service quality, service delivery, service product, service environment.

INTRODUCTION

The effectiveness of the Information Systems (IS) function within organizations has long been a topic of interest for both researchers and practitioners. Much of this interest has been driven by the large amounts of capital invested in IS and the lack of measurable results. According to a 2001 Gartner study, over $700 billion a year is spent on IS worldwide (Seddon, Graesar, and Willcocks, 2002). Providing metrics to justify these enormous sums has become something akin to the quest for the Holy Grail. Commonly used metrics focus on the products of IS by measuring such variables as system usage, cost/benefit analysis, and critical success factors (Ein-Dor and Segev, 1982; King and Schrems, 1978; Zahedi, 1987).

The push to measure IS effectiveness has not just been restricted to "hard" measures. There have also been numerous attempts to measure the more perceptual aspects of the IS function. Two examples of this type of "soft" measure include user satisfaction and service quality. While user satisfaction has enjoyed the lion's share of researcher attention (e.g., Bailey and Pearson, 1983; Doll and Torkzedah, 1988; Ives, Olson, and Baroudi, 1983) it is reasonable to argue that service quality is every bit as appropriate a surrogate for IS effectiveness.

On the surface, the IS function has a considerable service component. Obvious examples of IS services include help desk support and hardware/software installations. At the same time, other IS services are less obvious. Examples include user training, project management, applications development, etc. Taking these less obvious services into account, some researchers have argued that the true role of IS is that of a classical services marketer (Watson, Pitt, Cunningham, and Nel, 1993). Following this line of reasoning, almost every task performed by the IS function can be classified as a service. As such, it is critical that managers be able to effectively measure the quality of these services. At present this crucial measurement is most often accomplished through the use of the SERVQUAL instrument (Parasuraman, Zeithaml, and Berry, 1988) originally developed in marketing.

SERVQUAL is based on a disconfirmation model which operationalizes service quality as the gap between a user's expectations of service and their perceptions of service received. These expectations and perceptions are measured across five dimensions: Tangibles, Reliability, Responsiveness, Empathy, and Assurance. While SERVQUAL has been widely used, numerous researchers have questioned the validity of the instrument (e.g., Babakus and Boller, 1992; Cronin and Taylor, 1992). Researchers have noted problems with SERVQUAL's dimensions (e.g., Carman, 1990), its use of differences

scores (e.g., Van Dyke, Kappelmann, and Prybutok, 1997), and its conceptualization of expectations (e.g., Teas, 1994). In addition to these significant problems, SERVQUAL also suffers from a problem that is more fundamental. Specifically, SERVQUAL presents an incomplete conceptualization of a service encounter. In short, although the measurement of service quality has been acknowledged to be important in determining IS effectiveness, the measurement instrument currently employed is both flawed and incomplete. Without a better instrument it is difficult to devise interventions for improving the quality of IS service. In order to develop a better instrument, we must first have a better model. This paper is motivated by the need to address this issue.

The paper begins by reviewing the historical development of the service component within IS. After establishing the motivations for service quality research, the paper provides a review of IS research efforts to date. Given that these efforts have centered on the use of SERVQUAL, the instrument's adoption by IS is detailed. The paper then discusses the on-going debate over SERVQUAL's validity. Particular attention is paid to the instrument's incomplete conceptualization of the service encounter. In an effort to address SERVQUAL's shortcomings, the paper employs the concepts of service delivery, service product, and service environment to develop a model of service quality specific to the IS function.

DEVELOPMENT OF THE IS SERVICE COMPONENT

Although researchers and practitioners now acknowledge the significance of the service component within IS, this has not always been the case. In fact, the movement towards a service mentality has been an evolutionary one. During the early years of IS, most activity was handled by a centralized authority whose primary role was that of a manufacturer (Zmud, 1984). This role involved the configuration and operation of a production facility with large scale hardware and software systems. Along with these activities the IS unit would also be responsible for establishing a sizable in-house applications group which would develop and maintain automated transaction-based systems. These activities were typically "backroom" and involved very little user interaction. The introduction of the personal computer in the early 1980s significantly altered this manufacturer role.

As users became proficient in the use of personal computers, the decentralization of the IS function accelerated. The role of IS expanded from that of a manufacturer to include distribution and technology transfer (Zmud, 1984). Interaction between users and IS increased substantially. By the 1990s, a significant service culture had developed between IS departments and their users. Today, the increased sophistication of the user community has raised the bar on what is expected from IS. In short, users have become highly-demanding customers (Kettinger and Lee, 1994). As a result, IS managers find themselves under increased pressure to deliver consistently high quality services. In order to meet these demands, it is essential that IS managers be able to accurately measure the quality of the services they provide.

IS MEASUREMENT OF SERVICE QUALITY

An early attempt to measure IS service quality can be found in the User Information Satisfaction (UIS) short form developed by Ives et al. (1983). Unfortunately, of the short form's three dimensions, only one (attitude towards EDP staff and services) can be considered a service quality measurement. The other two dimensions measure quality of information products and the level of user knowledge and involvement. Noting the insufficiency of the UIS short form, Kettinger and Lee (1994) proposed that it be supplemented with the SERVQUAL instrument developed in marketing.

IS Adopts SERVQUAL

SERVQUAL was developed by Parasuraman, Zeithaml, and Berry (1988) as a way to measure the gap between a consumer's expected and perceived level of service quality. The gap is measured across five dimensions:

Tangibles:	Physical facilities, equipment, and appearance of personnel
Reliability:	Ability to perform the promised service dependably and accurately
Responsiveness:	Willingness to help customers and provide prompt service
Assurance:	Knowledge and courtesy of employees and their ability to inspire trust and confidence
Empathy:	Caring, individualized attention the firm provides its customers

SERVQUAL is administered as two questionnaires (one to capture expectations and one to capture perceptions). The questionnaire items use a seven point Likert-type scale anchored with "strongly disagree" and "strongly agree". The responses on the expectation questionnaire are then subtracted from the corresponding responses on the perception questionnaire. The resulting difference score represents the perceived level of service quality.

In order to establish the usefulness of SERVQUAL in the IS domain, Kettinger and Lee (1994) conducted a study in which both UIS short form and SERVQUAL questionnaires were distributed to business students at a major university. The SERVQUAL questionnaire was adapted to the IS domain by slightly modifying the wording of its 44 items. No items were added to the questionnaire, nor were any deletions made. An example of an IS-adapted SERVQUAL instrument can be seen in Appendix I.

Analysis of the survey responses indicated that the short form alone was not as comprehensive as the SERVQUAL instrument when evaluating IS service quality. Specifically, the Reliability and Empathy dimensions of SERVQUAL were not adequately represented in the UIS instrument. Based on their findings, Kettinger and Lee (1994) argued that SERVQUAL could be used to supplement the service dimensions of the UIS short form.

Following Kettinger and Lee's (1994) evaluation of SERVQUAL, a number of other IS researchers began to investigate its uses. Noting IS's growing service component, Pitt, Watson, and Kavan (1995) argued that the DeLone and McLean (1992) model of IS success should be augmented to include service quality (Figure 1).

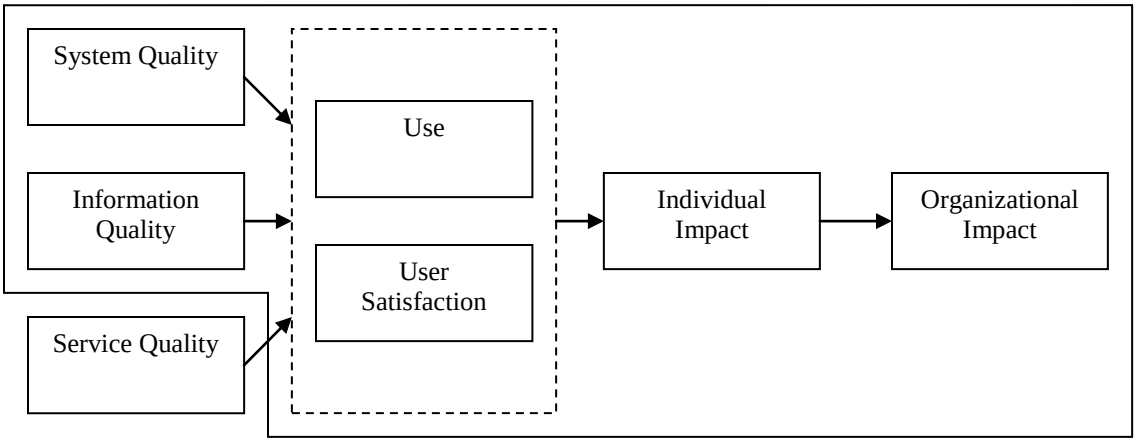

Figure 1. Augmented IS Success Model (Pitt et al., 1995)

Their model shows service quality as an antecedent of both use and user satisfaction. Given that service quality can influence IS success, Pitt et al. (1995) argued that a comprehensive measure was required. For this task they also proposed SERVQUAL.

In order to test the validity of SERVQUAL in the IS domain, Pitt et al. (1995) administered the IS-adapted instrument to three organizations: a large South African financial institution, a large British consulting firm, and a U.S. information services company. Analysis of the responses showed that the IS-adapted SERVQUAL exhibited good content validity, convergent validity, and reliability. The instrument did not perform as well on discriminant validity. Specifically, factor analysis showed that a seven factor model (splitting the Tangibles and Empathy dimensions in two) was more appropriate for the financial institution, while a two factor model (dropping Tangibles, Responsiveness, and Empathy) was more appropriate for the information services company. The five factor model proved to be a good fit only for the consulting firm. Pitt et al. (1995) acknowledged these problems by stating that "SERVQUAL does not always clearly discriminate among the dimensions of service quality" (p. 181). They did not, however, believe that these problems were significant enough to discontinue use of SERVQUAL. Pitt et al. (1995) concluded that as long as potential users were cautious, SERVQUAL could be used as a valid measure of IS service quality.

Since its introduction to the IS domain by Kettinger and Lee (1994) and Pitt et al. (1995), SERVQUAL has been used in a number of studies of IS service quality. Researchers have continued to expand the use of SERVQUAL into new areas. Examples include the use of SERVQUAL to measure service quality longitudinally (Watson, Pitt, and Kavan, 1998) and internationally (Kettinger, Lee, and Lee, 1995). The instrument has even been used to measure the quality of service provided by websites (Li, Tan, and Xie, 2003; Wang and Tang, 2003).

Problems with SERVQUAL

Although SERVQUAL has been widely used, researchers have noted a number of problems with the instrument. The most often cited problems include: 1) the instrument's unstable dimensionality (Babakus and Boller, 1992; Carman, 1990; Cronin

and Taylor, 1992); 2) the instrument's use of difference scores (Brown, Churchill, and Peter, 1993; Van Dyke et al., 1997); and 3) the instrument's conceptualization of expectations (Teas, 1994). Although these problems are significant, SERVQUAL suffers from a more fundamental problem in that it presents an incomplete conceptualization of a service encounter. According to Shostack (1987), a service encounter is the period of time during which the service provider and the consumer interact either in person, over the phone, or by other media. Marketing researchers have identified a number of factors relevant during such an encounter (e.g., Bitner, 1992; Gronroos, 1990; Rust and Oliver, 1994). By comparing perceptions and expectations for each of these factors, the user arrives at an overall perception of service quality. In order to understand how SERVQUAL fails to completely capture these service encounter factors, the following sections develop the concepts using examples drawn from the IS function.

SERVICE ENCOUNTER FACTORS

In any given service encounter, a number of factors influence the mental calculus used to compare service expectations with the perception of service received. These factors act as antecedents to service quality's formation. Although different antecedents have been proposed by various researchers (e.g., Bitner, 1992; Gronroos, 1990; Gummesson, 1992; Parasuraman et al., 1988), the list of antecedents proposed by Rust and Oliver (1994) is the most inclusive. According to Rust and Oliver (1994) the antecedents of service quality are: 1) the service delivery; 2) the service product; and 3) the service environment (see Figure 2).

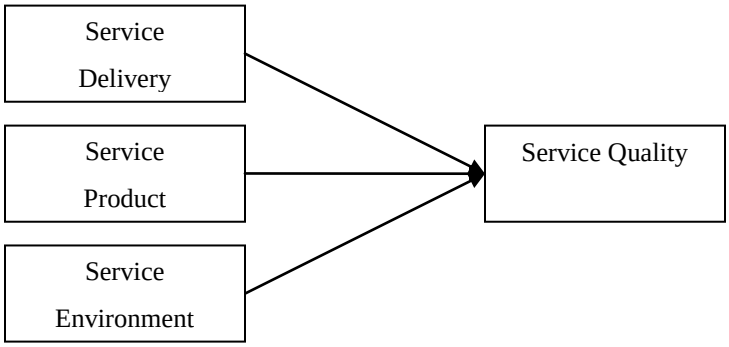

Figure 2. Research Model

Service Delivery

By far, the most researched antecedent of service quality is the service delivery (Schneider and White, 2004). Service delivery can be defined as the aspects of the service encounter that involve the service provider and his, or her, interaction with the consumer. Researchers like Rust and Oliver (1994), often liken service delivery to a performance.

In line with disconfirmation theory, service delivery can be assessed through the comparison of expectations and perceptions. Even before a service encounter, consumers are believed to have expectations concerning the sequence of events and the provider's role in the interaction (Folkes, 1994; Steenkamp and Hoffman, 1994). Deviations from these expectations, once perceived by the consumer, can either positively or negatively affect the assessment of the delivery. As an example, a user may consider IS employees to be highly educated and professional. Given that professionals are expected to behave in a rational and decorous manner, the user will then associate these expectations of professional behavior with IS employees. It should be noted that these expectations could have been formed without the user having ever interacted with an IS employee. When the user does eventually interact with an IS employee, the user's perception of the employee's performance will be compared with the expectations of professional behavior. If the IS employee is rude or exceedingly tardy, the user's expectations will be disconfirmed and the assessment of the delivery will be negative. If, on the other hand, the employee is on time, courteous, and knowledgeable, the user's expectations will be confirmed and the assessment of delivery will be positive.

Service Product

Possibly the least researched antecedent of service quality is the service product. This may be due to the seeming paradox represented by the construct's name. Given that services are not products, and vice versa, how can there be such a thing as a service product? A definition is clearly needed. According to Gronroos (1990), the service product is the service itself. Said

another way, if the service delivery is the "how" of a service encounter, then the service product is the "what". As an example, a user who has forgotten his network password can phone the IS help desk to have it reset. The interaction of the user and the IS employee (making the request, verifying the user's id, processing the request, etc.) are all part of the service delivery. The reset password which allows the user to access his account is the service product.

Following the disconfirmation paradigm, service products can also be assessed through the comparison of expectations and perceptions. Much as with service delivery, users will form expectations of the service product before it is delivered. These expectations may relate to the effectiveness of the service (it will work well), the utility of the service (it will be useful), and the innovativeness of the service (it will be cutting edge). Once the service product has been delivered, the user's perceptions will either confirm or disconfirm these expectations. If the perceptions exceed the expectations, then the user will rate the quality of the service product as positive. If the expectations exceed the perceptions, then the user will rate the quality of the service product as negative.

Service Environment

According to Rust and Oliver (1994), service environment refers to the appearance of the facilities, equipment, personnel, etc. involved in the service encounter. Service environment captures those aspects of the service encounter that affect the service delivery, while not actually being part of the service product. This construct has also been labeled as "atmospherics", or servicescape (Bitner, 1992). Specific aspects captured by service environment include: lighting, layout, temperature, signage, dress, communication media, etc.

Like service delivery and service product, service environment can be assessed through expectation disconfirmation. Users are likely to form expectations concerning IS facilities, equipment, personnel, etc. without having firsthand experience. The expectation that IS would have "clean-room" facilities, filled with high-tech equipment and "geeky" employees is not far-fetched given the manner in which IS is portrayed in the entertainment media. These expectations (or other variations) could then be compared with actual perceptions during the service encounter. Thus, a user who actually visited a dusty computer center in the windowless basement of his office building would disconfirm his expectations and rate the service environment negatively.

The problem with the above example is that it very rarely happens. Unlike customers of banks or department stores, users of IS services seldom visit the actual IS facility. Instead, most users interact with IS personnel in their own workspaces (hardware/software installs) or virtually via the phone or email (report request, file recovery, etc.). This greatly reduces their ability to evaluate the service environment. This position is supported by the fact that SERVQUAL's Tangibles dimension consistently lacks significance in IS research (Jiang, Klein, and Crampton, 2000; Kettinger and Lee, 1994; and Pitt et al., 1995). Since the Tangibles dimension captures the appearance of facilities, equipment, and personnel, it would appear that service environment would likewise be insignificant in IS. While this may turn out to be true, it seems worthwhile to examine other aspects of the service environment not currently being captured by SERVQUAL's Tangibles dimension. One such aspect of the service environment is the communications media. Even when IS employees and users interact via electronic media (phone, email, Internet, etc.) a service environment exists, albeit a virtual one.

DIRECTIONS FOR FUTURE RESEARCH

Having proposed a conceptual model of service quality for the IS function, the next logical step is to validate the model through the development of a measurement instrument. Based on the issues raised by SERVQUAL's detractors, designing such an instrument could be a challenge. As an example, researchers will have to decide whether the new instrument should measure expectations and perceptions separately, or whether some other method should be used. Some researchers have argued that measuring perceptions alone is sufficient (Cronin and Taylor, 1992), while others have argued for using a direct disconfirmation measure (Carman 1990). Regardless which method is used, researchers will also face the challenge of creating survey items to capture new constructs like IS service product and virtual service environment. Even when the instrument has been developed it will face a challenge from SERVQUAL itself. If the new instrument cannot outperform SERVQUAL its acceptance by researchers and practitioners will be limited.

Once the model is validated, a number of research possibilities exist. As examples: 1) researchers can investigate the relative importance of the factors in predicting service quality given differences in organizational culture; 2) researchers can test factors which may moderate the relationships described in the model; and 3) researchers can develop and test interventions which practitioner can use to more effectively manage their quality of service.

CONCLUSION

The conceptual model presented in this paper has implications for both researchers and practitioners. For researchers in the IS domain, the model presents a new way of conceptualizing service quality. This causal view is significantly different from the dimensional view espoused by the dominant measurement instrument in use, SERVQUAL. As such, it allows researchers to more thoroughly explore the nomological network of service quality. By further investigation, researchers will be able to improve theories of IS effectiveness, which should lead to a fuller understanding of the IS "productivity paradox". For practitioners, the model identifies three possible points of intervention in the management of IS services: the service delivery, the service product, and the service environment. This will allow mangers to create targeted interventions for specific problem areas.

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