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AN EXAMINATION OF INFORMATION SYSTEMS SERVICE QUALITY MEASUREMENT: THE CONTRIBUTION OF THE SERVQUAL INSTRUMENT FROM THE MARKETING LITERATURE

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Abstract

Due to the increasing service component of information technology, service quality measurement has become increasingly important for IS practitioners as they attempt to increase service quality to customers. The measurement of service quality in IS evolved from the research done in the marketing literature. The SERVQUAL instrument has evolved to become the most commonly used measurement instrument in both IS and marketing. Although commonly used, the SERVQUAL instrument is not without criticism. Thus, alternatives have evolved which attempt to address those criticisms. This paper describes the SERVQUAL instrument, its criticisms and support, and finally the SERVPERF instrument, a variation of the SERVQUAL instrument which is an attempt at improving upon the SERVQUAL instrument.

Keywords: Service quality measurement, SERVQUAL, information systems

Introduction

Service quality can be defined as the conformance to customer requirements in the delivery of a service. It is a perceived judgment that results from comparing customer expectations with the level of service customers perceive to have received (Parasuraman, Zeithaml, and Berry 1988). Since quality can be engineered into a manufacturing production process using statistical quality control processes, progress in manufacturing quality control has evolved rapidly (Garvin 1983). The measurement of quality in service delivery has proved more difficult. Services tend to be performance oriented, thus making precise specifications to a uniform quality difficult to implement and measure (Kettinger and Lee 1994).

This paper is a literature review that will provide an historical background for the development and history of the SERVQUAL instrument. A review of the extant marketing and IS literature provided the basis for this research. The purpose of this research is to provide a detailed summary of the evolution of service quality measurement, the criticisms of the SERVQUAL instrument, support for the SERVQUAL instrument, and suggestions for selection of the SERVQUAL variation to use in IS research.

The measurement of service quality in the IS literature is based on the pioneering work completed in the marketing literature years before, which will be described first. This will be followed by a summary of the SERVQUAL variations. A discussion of the criticisms will be next. Finally, the application of the SERVQUAL to the IS literature will conclude the paper.

Development of the SERVQUAL Instrument

Service quality has been the most researched area of services marketing (Fisk, Brown, and Bitner 1993). A key point in the service marketing literature began with a series of interviews conducted in the 1980s by Parasuraman, Zeithaml, and Berry (Parasuraman, Zeithaml, and Berry 1985). They undertook an exploratory investigation of service quality by beginning with a series of focus

group interviews with consumers and executives at four nationally recognized service firms. The researchers were attempting to gain insights into the following areas.

- Service quality attributes as perceived by service firm managers and consumers
- Common problems and tasks associated with providing high quality service to customers
- Differences in consumer and service marketers' perceptions of service quality
- The feasibility of combining consumer and marketer perceptions into one service quality model viewed from the consumer's perception.

As a result of their research, Parasuraman, Zeithaml, and Berry concluded that service quality is based on the difference between what the consumer expects, and what they actually receive. Others have used the same definition (Sasser, Olsen, & Wychoff, 1978). Parasuraman and his fellow researchers suggest that service quality be measured as the difference between the sum of customer's expectations and perceptions of actual performance levels for a set of service attributes (Parasuraman, Berry, and Zeithaml 1991a; Parasuraman, Zeithaml, and Berry 1985). They identified exceeding customer expectations as a way to maximize quality. The higher the performance-minus-expectation score is, the higher the level of perceived service quality.

The SERVQUAL instrument emerged from the Parasuraman, Berry, and Zeithaml research as an on oft-used measure of service quality. This instrument has been adapted and used in many other service industries. Examples of instrument use include, but are not limited to, industries such as retail (Hui 2002), local government (Wisniewski 2001), library service (Cook and Thompson 2000), hospital service (Lam 1997), shipping (Srinivas, Lysonski, and Mehta 1999), and information systems (Jiang, Klein, and Crampton 2000; Kettinger and Lee 1997; Pitt, Watson, and Kavan 1997; Van Dyke, Kappelman, and Prybutok 1997), where the applicability of the instrument has been studied and researchers (Jiang, Klein, and Carr 2002; Jiang, Klein, and Crampton 2000; Kettinger and Lee 1997; Pitt, Watson, and Kavan 1997) argue that it has great potential.

History of Service Quality Assessment

The 1985 Parasuraman, Berry, and Zeithaml article, resulting from in-depth interviews, identified a group of five key gaps that exist in regards to executives' perception of service quality. This research began the modern service quality discussion in the marketing discipline. The gaps identified in the 1985 article and a definition of each follows.

- Gap 1: Difference between consumer expectations and management perceptions of consumer expectations.
- Gap 2: Difference between management perceptions of consumer expectations and service quality specifications.
- Gap 3: Difference between service quality specifications and the service actually delivered.
- Gap 4: Difference between service delivery and what is communicated about the service to consumers.
- Gap 5: Difference between consumer expectations and perceptions of actual service.

The focus groups used in the 1985 article revealed a common set of criteria used in evaluating service quality. These criteria were labeled "service quality determinants" (pg 48) and are shown in Figure 1. A brief description of each follows.

Reliability involves honoring promises, delivering service on-time, and maintaining a consistent level of performance and dependability. Responsiveness is the willingness of an employee to perform a service in a timely manner. Competence is the possession of the needed skills and knowledge to attain a service goal. Access is the convenience and ease of contacting a service provider. Courtesy involves appearance, politeness, respect, consideration and friendliness of the service provider. Communication is the information, including cost, service level, and problem resolution process, provided to the service customer. Credibility of the service provider revolves around keeping the customers' best interest in mind. Credibility entails trustworthiness, believability, and honesty. Security and is concerned with minimizing or eliminating danger and risk. Understanding and knowing the customer involves taking the time to recognize the needs of the customers, as well as providing individual attention. Lastly, tangibles include the physical presence of the service such as facilities, personnel appearance, and equipment.

After assessing the determinants and gaps associated with service quality, an instrument was produced that contained 97 items related to expectations of service a customer would expect within a particular service category and 97 items related to a customer's perception of the actual service quality that was received during the last service encounter with a particular service provider (Parasuraman, Zeithaml, and Berry 1988). The 97 items were constructed based on the ten service quality dimensions determined earlier. The instrument was administered to 200 adult respondents in a large shopping mall. The respondents were segmented across five service categories – appliance repair and maintenance, retail banking, long-distance telephone, securities brokerage, and credit cards. The above five service categories were chosen because they were representative of service in general (Lovell 1983).

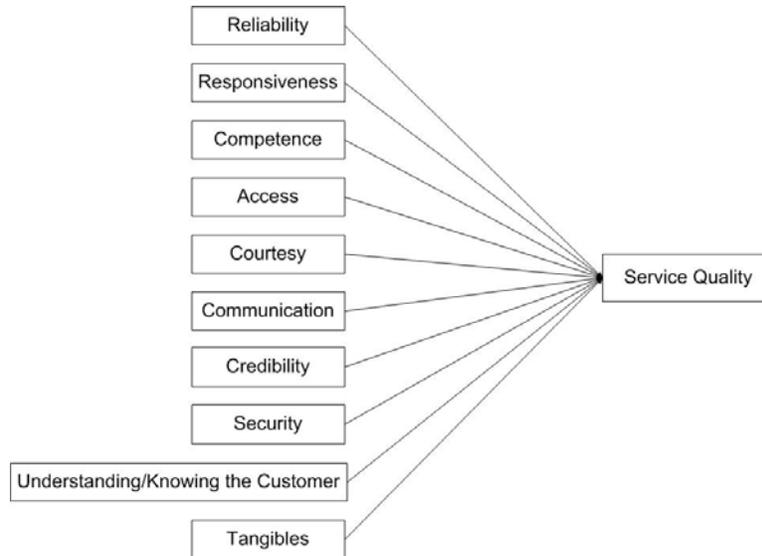


Figure 1. Determinants of Service Quality

Measurement items were calculated by comparing perceived performance of the service provider and customer expectations. The famous equation, $Q=P-E$, was derived from Gap 5, where Q = perceived service quality, P = perceived service, and E = expected service. According to the equation, the key to maximizing service quality is in maximizing the perceived service – expected service gap. The resulting items were then plotted in rank order by correlation for each dimension. Items with low correlations were removed from the instrument. An iterative process was undertaken until a final set of 54 items was revealed. Factor analysis was then performed to further investigate. Thirty-four items emerged from the factor analysis representing seven distinct dimensions. Five of the 10 original dimensions remained- tangibles, reliability, responsiveness, understanding/knowing customer, and access. The remaining five dimensions, communication, credibility, security, competence, and courtesy, collapsed into two distinct factors labeled D4 and D5 (Parasuraman, Zeithaml, and Berry 1988).

To further evaluate the instrument, a second sample was selected from a shopping center in another part of the country. An analysis of the survey data ultimately resulted in a 22 item SERVQUAL after 12 items were removed due to low correlation scores and poor factor loadings. Factor analysis resulted in five factors. The factors Tangibles, Reliability, and Responsiveness remained the same as in the previous analysis. Two new factors were established by collapsing previously established factors together. Assurance evolved as a result of combining D4 and D5, while Empathy emerged from the combining of Understanding/Knowing the Customer and Access. Items representing the original dimensions of communication, credibility, security, competence, courtesy, understanding/knowing customer, and access, ultimately loaded in the dimensions Assurance and Empathy. Although SERVQUAL resulted in five distinct factors, each of the original 10 dimensions are represented in the instrument. A brief description of the five dimensions follows (Parasuraman, Zeithaml, and Berry 1988).

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

Quantitative tests on the data across multiple industries and stages revealed high reliability in the instrument. Further, a consistent factor was developed, even after returning to the stage one data, removing the 12 items displaced in stage two, and reanalyzing the data. Further tests provide statistical support for validity of the instrument. Ultimately a 22-item scale was developed, with good reliability and validity, that could be used to measure and understand service quality (Parasuraman, Zeithaml, and Berry 1988).

Parasuraman, Berry, and Zeithaml continued their work into the 1990s with success as well. A zone of tolerance, or the difference between a customer's adequate level of service and their desired level of service, was later discovered (Zeithaml, Berry, and

Parasuraman 1993). Evaluating the zone of tolerance required the addition of another SERVQUAL section or column, namely the minimal level of service required. This newer conceptual SERVQUAL model is based on the following two propositions:

1. Customers assess service performance based on two standards: what they desire and what they deem acceptable.
2. A zone of tolerance separates desired service from adequate service.

In essence, the zone of tolerance is the area in which customers tolerate service levels. As long as customers are in this zone, they are accepting of the level of service currently being received. This zone is apt to fluctuate depending on a number of factors such as price (Zeithaml, Berry, and Parasuraman 1993). For example, an increase in the price of a service may not affect the desired level of service required by a customer although the price increase could require a higher level of adequate service, thus decreasing the size of the zone of tolerance.

SERVQUAL Variations

The SERVQUAL instrument is one of the premiere instruments used to measure perceived service quality by customers (Van Dyke, Prybutok, and Kappelman 1999). It has a rich tradition in the marketing literature and has been validated numerous times in a variety of situations.

The original version of SERVQUAL (Parasuraman, Zeithaml, and Berry 1988) consists of two section, both containing 22 questions. The first section measures service expectations of companies within a certain industry. The second section measures the customers' perception about a particular company in that industry.

Several changes were made to the original instrument in 1991 (Parasuraman, Berry, and Zeithaml 1991a). The modifications included:

- 1) The "should" terminology was thought to contribute to unrealistically high expectation scores. Thus slightly different wording was used to alleviate this potential problem. The revised wording focused on what customers would expect from companies that deliver excellent service. An example of an original and updated item follows.
Original item 2. Their physical facilities should be visually appealing.
Revised item 2. The physical facilities at excellent telephone companies will be visually appealing
- 2) On the perception side of the scale, slight wording changes were made to make items more consistent with the revised expectation items.
- 3) In the original SERVQUAL format, six of the 22 items were negatively worded. Empirical tests revealed the negatively worded items could potentially cause problems. Negatively worded items were reworded in a positive format.
- 4) Two items were dropped and two were added. The items were substituted to more fully capture the dimensions and to incorporate suggestions made by managers who were involved in pre-testing the instrument.

The next SERVQUAL version, in 1994, (Parasuraman, Zeithaml, and Berry 1994) was based on the zone of tolerance concept (Zeithaml, Berry, and Parasuraman 1993). The calculation of the zone of tolerance is achieved by subtracting minimum service from the desired service rating. The addition of minimum service resulted in a third column (in addition to one for perceived service and one for expected or desired service), thus the "three-column format" of SERVQUAL.

The use of gap measures, inherent in all SERVQUAL versions, has been challenged by some researchers (Christopher L. Carr 2002; Peter, Churchill, Jr., and Brown 1993). They argue service quality should be measured with the SERVPERF instrument. This instrument measures perceived service quality only, thus a gap score is not calculated which has been argued to cause problems with service quality measurement. Additionally, the SERVPERF provides greater variance explanation than SERVQUAL and uses a smaller number of items (Bolton and Drew 1991; Churchill, Jr. and Suprenant 1982; Cronin and Taylor 1992; Woodruff, Cadotte, and Jenkins 1983). A comparison of the SERVQUAL and SERVPERF instruments provided support for the superiority of SERVPERF (Cronin and Taylor 1992). In particular, Cronin and Taylor conclude that more of the variation in service quality, as measured by R^2 , is measured by SERVPERF as compared to SERVQUAL (Table 1). Additionally, the SERVPERF scale reduces the number of scale items from 66 (in the three-column format) or 44 (in the two-column format) to

22, thus making it more efficient, as well as reducing the potentially negative effects of gap measures, which will be discussed in a later section.

Table 1. SERVQUAL versus SERVPERF Correlation Scores

	Banking	Pest Control	Dry cleaning	Fast Food
SERVQUAL	.46511	.36515	.30747	.41534
SERVPERF	.47895	.38760	.44675	.47585

Criticisms of the SERVQUAL Instrument

Some researchers, Roy Teas in particular, have attacked the SERVQUAL instrument “both theoretically and empirically” (Grapentine 1998). Teas (1993) examined conceptual and operational issues related to SERVQUAL. In particular, he indicated that the P-E framework is of questionable validity due to the

- 1) Operational definition problems
- 2) Dimensionality

Teas (1993, 1994) argues that several vague or ambiguous references are included in SERVQUAL. Teas argued that vagueness and ambiguity inherent in the instrument introduced measurement error in the responses. An example Teas identified is the “minimum level of service customers are willing to accept” (Parasuraman, Zeithaml, and Berry 1994, pg. 203). He argues that “minimum level of service” and “willing to accept” are vague terms because of the potential interpretation differences these phrases could introduce.

Parasuraman, Zeithaml, and Berry (1988) found five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. Cronin and Taylor (Cronin and Taylor 1992) examined the dimensionality of the SERVQUAL instrument by means of a confirmatory factor analysis. Their results showed that the 5-component structure proposed by Parasuraman, Zeithaml, and Berry (1988) was not confirmed in their research samples.

They then evaluated the unidimensionality of the 22 SERVQUAL items with a factor analysis of the SERVQUAL scale. The results showed all items loading on a single factor except item 19 (personal attention). They dropped the item and recalculated the reliability. The revised analysis suggested the scale could be treated as unidimensional. Other research results across multiple industries indicate the presence of two to nine dimensions (Babakus and Boller 1992; Brady and Cronin 2001; Carman 1990; Lam 1997). No clear pattern of factors across industries has been established. Since dimensionality results have yet to be consistent between research, it is important for researchers to continue to compare factor structures across different samples (Chin and Todd 1995).

Validity of Service Quality Measures

Survey validity is concerned with the “extent to which a particular measure relates to other measures consistent with theoretically derived hypotheses concerning the concepts that are being measured” (Carmines & Zeller, 1979), p.23). Specifically, convergent validity measures the extent to which a measure correlates highly with other measures that are used to measure the same construct. Parasuraman, Zeithaml, and Berry (1988) used ANOVA to investigate the instrument’s convergent validity by examining the relationship between the SERVQUAL scores and an overall service quality rating of the firm being evaluated. Results indicated support for SERVQUAL’s convergent validity across four independent samples. Discriminant validity measures the extent to which a measure is “novel and does not simply reflect some other variable” (Churchill, Jr. 1979). Cronin and Taylor (1992), in their study of service quality across four industries (banking, pest control, dry cleaning, and fast food), showed the three service quality scales (SERVQUAL, SERVPERF, and overall service quality items) correlated more closely with each other than with measures of overall service quality, satisfaction, and purchase intention. Correlation coefficients are shown in Table 2, which is reproduced from Cronin and Taylor (1992).

Table 2. Correlation Coefficients from Cronin and Taylor 1992

	SERVQUAL	SERVPERF	Overall Service Quality	Satisfaction	Purchase Intent
SERVQUAL	1.0000				
SERVPERF	.8100	1.0000			
Overall Service Quality	.5430	.6012	1.0000		
Satisfaction	.5605	.5978	.8175	1.0000	
Purchase Intent	.3534	.3647	.5272	.5334	1.0000

Based on the convergent and discriminant validity tests performed, it may be suggested that caution should be exercised when using the SERVQUAL instrument. A consistent pattern of validity has yet to be established, thus causing concern. Moreover, it appears that the perception scores may provide a better means of measuring service quality (Brady, Cronin, and Brand 2002a; Brady, Cronin, and Brand 2002b; Cronin and Taylor 1992; Cronin and Taylor 1994).

The gap nature of the scores produced with the SERVQUAL instrument are another area of concern (Peter, Churchill, Jr., and Brown 1993). Research indicates that the gap nature of the SERVQUAL scores tends to cause reliability and validity problems (Peter, Churchill, Jr., and Brown 1993). Reliability of difference, or gap, scores are dependent on their component scores' reliability and their correlation to each other. The reliability of difference scores is decreased as the correlation of the component scores increase.

History of Information Systems Service Quality Assessment

The SERVQUAL instrument was first introduced to the IS literature in 1994 by Kettinger and Lee. Their goal was to find an instrument that was a more comprehensive and current measure of user satisfaction than the existing User Information Satisfaction (UIS) instrument (Ives, Olson, and Baroudi 1983); (Leitheiser and Wetherbe 1986a). Baroudi and Orlikowski (1988) comment that the UIS instrument was developed in, and is more applicable to, an era of large, centralized transaction processing systems rather than personal computer and network-based services environment which is prevalent today. The role of IS within organizations has changed from the development and operation of large hardware systems, to additionally providing technology transfer and distribution of services (Leitheiser and Wetherbe 1986b). As a result of systems becoming more distributed and services becoming more prevalent, a newer, more comprehensive measure should be used (Galletta and Lederer 1989; Parasuraman, Berry, and Zeithaml 1991b).

Kettinger and Lee (1994) slightly modified the 1991 SERVQUAL (Parasuraman, Berry, and Zeithaml 1991a) instrument from the marketing literature by making minor wording changes to clarify them in the IS realm. Examples of changes are included in Table 3.

Table 3. Sample SERVQUAL Item Wording Differences

Parasuraman, Berry, and Zeithaml – 1991	Kettinger and Lee - 1994
#4. Materials associated with the service (such as pamphlets or statements) will be visually appealing in an excellent telephone company.	#4. Materials associated with the service (such as documentation, equipment, screen displays, etc.) will be visually appealing in an excellent telephone company.
#9. Excellent telephone companies will insist on error-free records.	#9. Excellent college computing services will maintain fully-functional equipment and software.

Kettinger and Lee (1994), as well as others (Jiang, Klein, and Carr 2002; Jiang, Klein, and Crampton 2000; Kettinger and Lee 1997; Kettinger, Lee, and Lee 1995; Van Dyke, Prybutok, and Kappelman 1999), found support for four dimensions (reliability, responsiveness, assurance, and empathy) in their research, along with a correlation of -0.651 between the perceived quality gap and the User Information Satisfaction (UIS) (Ives, Olson, and Baroudi 1983).

Pitt, Watson, and Kavan (Pitt, Watson, and Kavan 1995) deemed it necessary to assess the validity of the SERVQUAL instrument in an IS setting prior to using the instrument. They tested the appositeness of the SERVQUAL instrument in three organizations – a British accounting information management consulting firm, a South African financial institution, and a US information services business that provided credit reporting and collection services to other firms. With reference to content validity, they began by considering Parasuraman and coauthors' (1988) thorough investigation of the SERVQUAL development with the use of focus groups. Pitt, Watson, and Kavan (1995) themselves then reflected on features that could be unique to IS, thus affecting the validity of the instrument. They could not discern any unique features, therefore concluding the instrument possessed content validity.

In terms of reliability as measured by Cronbach's alpha, results indicate that the reliability of each of the dimensions was sufficient. Convergent validity was also tested. The high correlation (.60 for the financial institution and information service firm and .82 for the consulting firm) between the overall service quality index and the response to the single-question overall quality indicated convergent reliability. The dimensionality of the instrument was unstable, with items loading into three, five, and seven factors for the IS service firm, consulting firm, and financial institution respectively. Some problems exist with regards to discriminant validity because some factors do not appear to be different from others. Although this introduces some validity uncertainties, there is "not enough to discontinue consideration of SERVQUAL" (pg. 181). Their overall contribution from this examination of the instrument is that "SERVQUAL passes content, reliability and convergent validity examination", thus "it is a suitable measure of IS service quality" (pg 181).

Criticisms of the IS-Adapted SERVQUAL

Even though some researchers support the IS-adapted SERVQUAL instrument, others have remained skeptical (Christopher L.Carr 2002; Van Dyke, Kappelman, and Prybutok 1997; Van Dyke, Prybutok, and Kappelman 1999). The main criticisms have revolved around some of the same issues related to the original Parasuraman, Zeithaml, and Berry instruments (1988, 1991), including ambiguity (especially related to expectations), the unsuitability of using a single measure across different industries, unstable dimensionality, and the use of disconfirmation scores (Christopher L.Carr 2002; Van Dyke, Kappelman, and Prybutok 1997). Some argue that the instrument has only limited applicability in today's distributed networking environment since the instrument was originally designed for use in a transaction processing environment of the 1980s (Galletta and Lederer 1989; Melone 1990)

A newer criticism of the SERVQUAL instrument arose from Carr's (2002) recent analysis of technical support service interactions within an internal helpdesk. The findings indicate that the raw perception and expected values explain less variance than does the perceptions minus expected quality gap measure. The mere manipulation of the raw scores through subtraction should not better the psychometric properties of the data. Carr therefore concludes that the use of the gap scores is invalid and should not be used.

After further testing by Carr (2002), even the individual raw scores did not provide a valid measure of perceived and expected service. Further testing included tests for content validity, factor structure fit, indicator reliability, convergent and discriminant validity. With regards to content validity, Carr used the Kettinger and Lee (1994) instrument which reduced the number of items by 40%, thus reducing domain coverage by 40% and leading to lowered content validity. A confirmatory factor analysis was performed to test the four-factor structure (reliability, responsiveness, assurance, and empathy) from previous research to the data. The SERVPERF component fit to the data was "very poor" (pg 285) while the fit of the SERVQUAL is "relatively good" based on root mean square errors and normed and non-normed fit index scores.

Indicator reliability was measured with R^2 , which should be greater than .50 (Fornell and Larcker 1981). Only four of 13 SERVPERF and six of 13 SERVQUAL gap measures exhibited indicator reliability, thus lacking evidence to support indicator reliability. Convergent and discriminant validity were evaluated, with only the reliability measure indicating even partial convergent validity and "no construct exhibit[ing] invariant discriminant validity with all other constructs (pg 287)." In conclusion, Carr (2002) argues the raw scores as well as the gap score are all invalid, thus indicating that the SERVQUAL instrument should not be used in IS research.

Service Quality Summary

In summary, results have been mixed in regards to the acceptable use of the SERVQUAL instrument in the IS environment. Problems attributed to the SERVQUAL instrument include operational definitions that are vague and ambiguous, unstable

dimensionality across industries, inconsistent validity across studies, and gap score issues that may result in reliability, validity, and variance restriction problems. These problems have added a certain level of uncertainty in the use of SERVQUAL as a measure of service quality to some researchers.

Some have argued it appears the SERVQUAL instrument can be used as a good predictor of overall success (Fisk, Brown, and Bitner 1993). The instrument has been qualitatively and quantitatively investigated in both the marketing and IS literature. SERVQUAL has proven valid for measuring service quality along four dimensions (Jiang, Klein, and Crampton 2000; Kettinger and Lee 1994) with IS users across a spectrum of industries (Jiang, Klein, and Crampton 2000). Some of the more recent usages of the SERVQUAL instrument in the IS literature across a variety of industries suggests adequate reliability, convergent validity, and discriminant validity of the instrument (Jiang, Klein, and Carr 2002; Jiang, Klein, and Crampton 2000), although reviews are mixed (Carr 2002).

Due to the mixed nature of the reviews that have resulted from the use of the SERVQUAL instrument, the SERVPERF instrument may be used to offer some improvement to service quality measurement. The SERVPERF instrument is a derivative of the original SERVQUAL instrument, only measuring performance of service quality. It still measures the same dimensions of service quality, thus maintaining the same measurement content. The improvements offered by the SERVPERF include the absence of gap measurement issues, greater variance explained, and a smaller number of items used. Comparisons of the SERVQUAL and SERVPERF instruments have shown the superiority of the SERVPERF (Cronin and Taylor 1992).

Contributions of This Research

This paper summarizes the development and evolution of the SERVQUAL instrument in the marketing literature as well as the introduction and evolution into the IS literature. Due to the increasing service component of information technology, service quality measurement has become increasingly important for IS practitioners as they attempt to increase service quality to customers (Pitt, Watson, and Kavan 1995). In sum, the contribution of the SERVQUAL instrument from the marketing literature has added considerably to the development of service quality assessment in the IS literature. The addition of the SERVPERF variation has provided an additional measure of service quality that takes less time to complete, explains more variance, and eliminates issues related to gap measures. Thus, the SERVPERF has become a better measurement instrument for service quality.

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