Service quality dimensions: an examination of Grönroos's service quality model

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Keywords

Service quality assurance, SERVQUAL, Service delivery

Abstract

Service quality researchers to date have paid scant attention to the issue of the dimensions of service quality. Much of the earlier work accepted the content measured by the SERVQUAL instrument. Following the argument that SERVQUAL only reflects the service delivery process, the study empirically examines the European perspective (i.e. Grönroos' model) suggesting that service quality consists of three dimensions, technical, functional and image, and that image functions as a filter in service quality perception. The results from a cell phone service sample revealed that Grönroos' model is a more appropriate representation of service quality than the American perspective with its limited concentration on the dimension of functional quality.

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Introduction

Service quality has been a frequently studied topic in the service marketing literature. Efforts to understand and identify service quality have been undertaken in the last three decades. A topic of particular interest in service quality research is the issue of measurement. Following the introduction of the SERVQUAL instrument (Parasuraman *et al.*, 1985), many scholars have attempted to replicate and refute its structure and conceptualization (Carman, 1990; Cronin and Taylor, 1992; Teas, 1993). Much of the research to date has focused on measuring service quality using the SERVQUAL instrument. Subsequently, research on the instrument has been widely cited in the marketing literature and its use in industry has become quite widespread (Brown *et al.*, 1993).

The earlier work has advanced our understanding of service quality measurement. At the same time, one criticism of SERVQUAL has been the point that the instrument mainly focuses on the service delivery process (Grönroos, 1990; Mangold and Babakus, 1991; Richard and Allaway, 1993). However, it is also true that there is no general agreement as to the nature or content of the service quality dimensions (Brady and Cronin, 2001). Nevertheless, there is a general perspective that service quality is a multidimensional or multi-attribute construct (Cronin and Taylor, 1992; Grönroos, 1990; Parasuraman *et al.*, 1985, 1988). That is, while the contemporary studies on service quality seemingly focused on the process of service delivery, additional aspects to be considered have already been suggested, especially by European scholars. For example, the semantic differences in each dimension notwithstanding, Grönroos (1982, 1990) and Lehtinen and Lehtinen (1982) noted that the quality of a service as perceived by customers has three dimensions: functional (or process) dimension, technical (or outcome) dimension, and image. Further, Richard and Allaway (1993) argued that utilizing only functional quality attributes to explain and/or predict consumers' behavior might be a misspecification of service quality and have low predictive validity.

To this respect, Brady and Cronin (2001) suggest that researchers generally adopt one of two conceptualizations in their work, the American or the European perspective. The focus on functional quality attributes is referred to as the American perspective of service quality while the European perspective suggests that service quality considers two more components, technical quality and image. As noted, much of the earlier service quality research has concentrated on the SERVQUAL

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

instrument, and consequently, on the functional quality dimension. No efforts have been made to test the European perspective. The purpose of this study is to extend our understanding of service quality by empirically examining the conceptualization of service quality suggested in the European perspective (i.e. Grönroos's model).

Theoretical background

The construct of service quality as conceptualized in the service marketing literature centers on perceived quality, defined as a consumer's judgment about an entity's overall excellence or superiority (Zeithaml, 1987). While the SERVQUAL instrument has been widely used, it has been subject to criticism (Asubonteng *et al.*, 1996; Buttle, 1996). Criticisms include the use of difference scores, dimensionality, applicability and the lack of validity of the model, especially with respect to the dependence or independence of the five main variables (Babakus and Boller, 1992; Carman, 1990; Cronin and Taylor, 1992).

The criticism of note to this study is the point that SERVQUAL focuses on the service delivery process and does not address the service-encounter outcomes (Grönroos, 1990; Mangold and Babakus, 1991). It is interesting to note that the developers of SERVQUAL initially suggested that service quality consists of functional (process) and technical (outcome) dimensions (Parasuraman *et al.*, 1985). However, the SERVQUAL instrument does not include any measure of the technical quality dimension. Essentially, technical quality has been neglected in efforts to study and measure service quality.

Service quality dimensions

Whereas service quality is known to be based on multiple dimensions (Grönroos, 1982, 1990; Parasuraman *et al.*, 1985), there is no general agreement as to the nature or content of the dimensions (Brady and Cronin, 2001). However, a review of the service quality studies to date explicitly shows that European scholars have exerted a great influence on the study of service quality dimensions. That is, the contemporary discussions on the dimensions of service quality have been initiated by European scholars. Lehtinen and Lehtinen (1982) defined service quality in terms of physical quality, interactive quality and corporate (image) quality. Physical quality relates to the tangible aspects of the service. Interactive quality involves the interactive nature of services and refers to the two-way flow that occurs between the customer and the service provider, or his/her representative, including both automated and animated interactions. Corporate quality refers to the image attributed to a service provider by its current and potential customers, as well as other publics. They also suggest that when compared with the other two quality dimensions, corporate quality tended to be more stable over time.

With the suggestion that the "perceived service quality model" replace the product features of a physical product in the consumption of services, Grönroos (1982) identified two service quality dimensions, the technical aspect ("what" service is provided) and the functional aspect ("how" the service is provided). The customers perceive *what* s/he receives as the outcome of the process in which the resources are used, i.e. the *technical* or outcome quality of the process. But s/he also and often more importantly, perceives *how* the process itself functions, i.e. the *functional* or process quality dimension. For some services the "what" (or technical quality) might be difficult to evaluate. For example, in health care the service providers' technical competence, as well as the immediate results from treatments, may be difficult for a patient (a customer) to evaluate. Lacking an ability to assess technical quality, consumers rely on other measures of quality attributes associated with the process (the "how") of health care delivery. For health care service, consumers would likely rely on attributes such as reliability and empathy to assess quality.

Grönroos also emphasized the importance of corporate image in the experience of service quality, similar to the idea proposed by Lehtinen and Lehtinen (1982). Customers bring their earlier experiences and overall perceptions of a service firm to each encounter because customers often have continuous contacts with the same service firm (Grönroos, 2001). Therefore, the *image* concept was introduced as yet another important component in the perceived service quality model, so that the dynamic aspect of the service perception process was considered as well. A favorable and well-known image is an asset for any firm because image has an impact on customer perceptions of the communication and operations of the firm in many respects. If a service provider has a positive image in the minds of customers, minor mistakes will be forgiven. If mistakes often occur, however, the image will be damaged. If a provider's image is negative, the impact of any mistake will often be magnified in the consumer's mind. In a word, image can be viewed as a filter in terms of a consumer's perception of quality.

Being explicitly influenced by the European perspective, Parasuraman *et al.* (1985) suggested that quality evaluations are not made solely on the

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

outcome of service; they also involve evaluations of the service delivery process. While the dimensions are intercorrelated, the primary basis for the dichotomy rests with when the evaluation occurs. For process quality, the evaluation occurs while the service is being performed. For outcome quality, evaluation happens after service performance and focuses on "what" service is delivered. However, their measurement of service quality (i.e. SERVQUAL) does not explicitly reflect both dimensions, but a functional dimension only. The focus on a functional dimension is one criticism of SERVQUAL (Baker and Lamb, 1993; Mangold and Babakus, 1991; Richard and Allaway, 1993).

Swartz and Brown (1989) attempted to synthesize the dimensions of service quality by illustrating the works of the service quality dimensions studied by Grönroos (1982), Lehtinen and Lehtinen (1982) and Parasuraman *et al.* (1985). Their main contribution was identifying dimensions of service quality based on the literature review and categorizing them into "what" (i.e. service evaluated after performance) and "how" (i.e. service evaluated during performance) categories. The work by Swartz and Brown, however, does not reflect Grönroos' (1990) later conceptualization of service quality perception that emphasizes the role of image as a filter in the perception of service quality in addition to the technical and functional quality dimensions.

A more recent conceptualization of the service quality dimensions was proposed by Rust and Oliver (1994). They proposed a three-component model in which the overall perception of service quality is based on a customer's evaluation of three dimensions of the service encounter:

(1) the customer-employee interaction (i.e. functional or process quality),
(2) the service environment, and
(3) the outcome (i.e. technical quality).

While research supports the contention that the service environment affects service quality perceptions (Bitner, 1992; Spangenberg *et al.*, 1996), it is conceptually difficult to distinguish the notion of service environment from the concept of functional quality that has been suggested in the literature. For example, Brady and Cronin (2001) proposed three factors comprising the service environment, ambient conditions, facility design, and social factors. The definition offered by Brady and Cronin (2001) suggests, however, that the service environments are elements of the service delivery process. In short, in the interest of parsimony it seems best to include elements of the service environment as components of the functional dimension.

Research model (Grönroos's service quality model)

The American perspective of service quality is based primarily on Parasuraman *et al.*'s (1985, 1988) proposition that service quality may be evaluated based on the functional quality dimension, characterized by five components. As noted earlier, this perspective does not account for additional dimensions of service quality. A more complete representation of service quality, based on the European perspective (Grönroos, 1982, 1990; Lehtinen and Lehtinen, 1982), should include three dimensions, technical, functional, and image. The current study seeks to extend our understanding of service quality by assessing a three-dimensional model that includes technical quality, functional quality, and image, based on Grönroos' (1982, 1990) model.

Starting with the proposition that service quality is multidimensional, it is possible to develop a framework to illustrate the structure of service quality. Developing such a framework involves identifying the dimensions of service quality (technical and functional), and the components thought to make up each dimension. Marketing scholars have yet to identify attributes (or components) that define the technical quality dimension, although it is widely accepted that technical quality significantly affects customers' perceptions of service quality (Grönroos, 1982, 1990; Rust and Oliver, 1994).

Attempts to measure technical quality have generally involved the use of qualitative methods (Brady and Cronin, 2001; Powpaka, 1996; Richard and Allaway, 1993). Brady and Cronin (2001) administered open-ended surveys that asked respondents to complete a questionnaire about the specific attributes they perceived regarding service experiences. Powpaka (1996) and Richard and Allaway (1993) employed in-depth interviews to discover relevant determinants of technical quality. The various studies have each used different items to measure technical quality. The findings to date suggest that there is no underlying latent variable associated with a technical quality dimension. The lack of attention to technical quality requires that researchers develop their own measures to assess the dimension.

Several authors have utilized the SERVQUAL instrument to measure the functional quality dimension (Powpaka, 1996; Richard and Allaway, 1993). Brady and Cronin (2001, p. 36) suggested that the SERVQUAL model uses the terms that describe one or more determinants of a "quality service encounter". That is, they suggested that the instrument may be used to assess the service

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

delivery process which happens during the encounter between a service provider and customers, in order to shed some light on our understanding of functional quality. Based on the preceding discussion, a hierarchical structure of service quality and the relationships among the dimensions are proposed (Figure 1).

The model proposes that service quality consists of technical and functional dimensions, and that a service organization's image functions as a filter in the perception of service quality. The model also proposes that there are direct relationships between service quality perception and the technical and functional quality dimensions, in addition to the indirect effects of technical and functional quality on service quality perception. Finally, the model suggests that service quality leads to customer satisfaction.

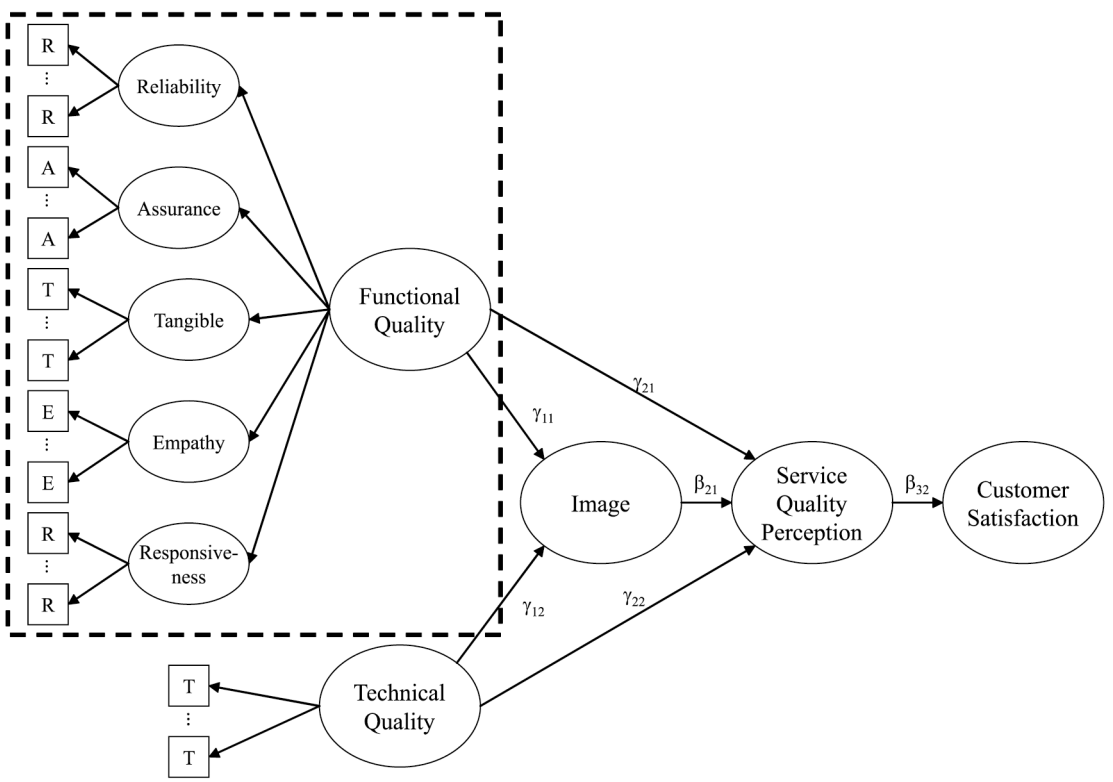
There is theoretical support for a multidimensional, multi-level model of service quality (Carman, 1990; Dabholkar *et al.*, 1996; McDougall and Levesque, 1994), but little effort has been taken to conceptualize and empirically test such a structure. Research on service quality and its relationship to customer satisfaction has been broadly conducted in the literature (Oliver, 1993; Taylor and Baker, 1994), but the role of image in the perception of service quality has received no attention from academicians. European scholars have suggested the importance of image, but their suggestions have been restricted to the conceptual level. Accordingly, the current study was undertaken in an effort to better understand the nature of the dimension(s) of service quality based on the European perspective and to provide some insights regarding the perception of service quality.

Methods

Sample

Participants were cell phone users in Korea recruited through a mall-intercept procedure. Thirteen male and six female undergraduate students were trained for the data collection. Cell phone users were selected as participants because cell phone service is considered to have an "experience" property whose technical quality is easily discernible by consumers. The trained interviewers randomly approached mall customers in the downtown area. Individuals were asked if they were cell phone users; current cell phone users were then asked which company was their service provider. Only current customers of two specific cell phone service providers (Company A and Company B) were asked to participate in the project. The number of participants was 464

Figure 1 Research model



Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

(Company A: 228, Company B: 236); the sample consisted of 345 men and 119 women.

Measures

Five constructs, functional quality, technical quality, image, overall service quality, and customer satisfaction, were operationalized in order to test the research model. The items were modified in English for cell phone service, and then translated into Korean. The instrument was reviewed by two Korean experts to ensure that the Korean wording and content of items was appropriate.

Functional (process) quality

The five SERVQUAL dimensions were modified and used to measure functional quality (see the Appendix). Modification of the instrument for different service settings is supported by the developers of the instrument (Parasuraman *et al.*, 1994). Following the suggestions made by Parasuraman *et al.* (1994), only the perceptions and not the expectations of functional quality were measured, since the measures were used to assess the influence of functional quality on other constructs.

Technical (outcome) quality

No measures have been developed to assess the technical quality of cell phone service providers. Unlike the other service categories whose outcome may not be easily discerned (e.g. health care), cell phone service users should be able to easily discern the service outcome. In-depth interviews with cell phone users and service providers were conducted to generate items to assess technical quality in the current study. Three items developed by the authors (see the Appendix) were measured using 7-point scales anchored by "Strongly disagree" (1) and "Strongly agree" (7).

Image

Although there are different levels of image (e.g. brand, product or company level) (Grönroos, 1990) a consumer may associate with a service provider, the respondents were asked to rate a company's overall image. Cell phone services were relatively new in Korea at the time of the data collection, which suggested that rating a company's overall image would be more appropriate than measuring the brand or product image. The measures for organizational image were developed specifically for this study by the authors. Image of the service provider was measured by having cell phone users respond to ten items (see the Appendix). Each item was measured using a 7-point scale anchored by "Strongly disagree" (1) and "Strongly agree" (7).

Overall service quality

The respondents were asked to rate the "overall service quality" of their current cell phone service provider using a 7-point semantic differential scale. Scores could range from "Very low" (1) to "Very high" (7).

Customer satisfaction

The instrument to measure customer satisfaction was adapted from the work of Oliver and Swan (1989). Since the original items were developed for the automobile buying experience, it was necessary to modify the items to relate to cell phone service (see the Appendix). All eight items were measured using 7-point scales anchored by "Strongly disagree" (1) and "Strongly agree" (7).

Analysis of scale properties

Before assessing the research model it was necessary to establish the validity and reliability of the modified items and the new items developed for this study. In order to have a valid construct, the items comprising a construct must be unidimensional. That is, all scales must be congeneric (i.e. measure one and only one latent construct) even though the latent constructs themselves may be intercorrelated (Jöreskog, 1971). The psychometric properties of each construct were evaluated in separate confirmatory factor models using LISREL 8.52. The model fit for each CFA was evaluated using the Tucker-Lewis's goodness-of-fit-index (TLI), Bentler's comparative fit index (CFI), and the Goodness-of-fit index (GFI). The root-mean-square residual (RMR) and the chi-square values were also reported as references for model fit. Construct reliability was evaluated including examining the parameter estimates and their associated t values and assessing the average variance extracted for each construct. The coefficient alphas were also reported to evaluate the reliability of each construct.

Individual items were also evaluated based on each item's error variance and residual values. McDonald (2002) suggests that residual values lower than 0.10 are good, and values ranging from 0.11 to 0.15 are acceptable. Both samples A and B were used for the analysis of the scale properties. Sample A was utilized to purify the scales; an initial CFA was computed to evaluate the model fit; modifications were made based on the evaluation of the fit and additional confirmatory analyses were computed with Sample A until satisfactory results, which included acceptable fit indices and no outstanding residual values were attained (Table I). Sample B was utilized to verify the psychometric properties of the purified scales. The items retained from the final assessment of Sample A (Table I) were analyzed using a CFA with

Table I Summary statistics of the CFA for Sample A and B

	# of initial items	# of final items	Construct reliability	AVE	Coefficient alpha	Parameter estimate	Chi-Square	df	GFI	CFI	TLI	RMR
Final CFA with Sample A												
Functional												
Reliability	5	3	0.78	0.54	0.77	0.63-0.78						
Responsiveness	4	3	0.81	0.59	0.78	0.57-0.85						
Assurance	4	3	0.78	0.55	0.76	0.53-0.84	323.20	94	0.92	0.94	0.93	0.05
Empathy	5	4	0.87	0.62	0.87	0.71-0.87						
Tangible	4	3	0.69	0.43	0.69	0.58-0.71						
Technical	3	3	0.78	0.54	0.78	0.68-0.79	Saturated model					
Image	10	4	0.87	0.62	0.86	0.61-0.92	29.73	2	0.97	0.97	0.91	0.04
Satisfaction	8	4	0.76	0.47	0.74	0.40-0.89	0.7162	2	0.99	0.99	0.99	0.01
Final CFA with Sample B												
Functional		3										
Reliability		3	0.79	0.56	0.79	0.68-0.81						
Responsiveness		3	0.81	0.60	0.77	0.52-0.89						
Assurance		3	0.77	0.53	0.75	0.57-0.81	281.77	94	0.93	0.95	0.94	0.05
Empathy		4	0.85	0.58	0.85	0.67-0.83						
Tangible		3	0.69	0.42	0.69	0.62-0.69						
Technical		3	0.72	0.46	0.71	0.61-0.75	Saturated model					
Image		4	0.83	0.57	0.82	0.46-0.93	8.97	2	0.99	0.99	0.97	0.02
Satisfaction		4	0.74	0.45	0.70	0.45-0.92	2.79	2	0.99	0.99	0.99	0.02

Sample B in order to reconfirm the factor structures (Table I).

Research model

The research model was tested using a structural equation modeling approach. LISREL 8.52 was used to estimate the parameters and assess the fit of the model shown in Figure 1. Since there are two approaches available in the structural equation modeling approach, it would be necessary to address each approach and the one that the study employs. In the case of Likert-scaled items, we always have the choice between a path analysis with latent variables-the common factor of the sets of item-scores and a simple path analysis of the item-sums (McDonald, 2002). The former approach is defined as total disaggregation and it uses each item as a separate indicator of the relevant construct and provides the most detailed level of analysis for construct testing (Dabholkar *et al.*, 1996). This approach has the advantage that the relationships are not "attenuated" by "error of measurement" while there is a disadvantage that inferences are about an infinite behavior/item domain that may not be capable of being well-defined and realized in application (McDonald, 2002). Furthermore, Bagozzi and Heatherton (1994, pp. 42-3) suggest that "in practice it (total disaggregation) can be unwieldy because of likely high levels of random error in typical items and the many parameters that must be estimated."

Conversely, fitting the path model to composites gives relationships that from one viewpoint are "attenuated" by "errors," and does not allow an account of error-of-measurement, but gives inferences about the actual measures, and supplies the best accounting of variance that the available measures permit (McDonald, 2002). Because single item indicators are inherently unreliable, research methodologists usually employ two or more observable indicators of each underlying construct (Hunter and Gerbing, 1982). Respondents' scores for each latent construct are then calculated as a summed or averaged composite of the observed indicators (Anderson and Gerbing, 1988; Bagozzi and Heatherton, 1994; Dabholkar *et al.*, 1996; John, 1984).

This study employs the latter approach to test the proposed conceptual model. In doing so, the unidimensionality checks were implemented in the previous section to satisfy the basic condition for using the composite scores. To this regard, Anderson and Gerbing (1988) and Gerbing and Anderson (1988) suggest that a composite which represents a latent factor is meaningful if the observable measures which are posited as indicators of the latent construct are acceptably unidimensional.

Results

CFA for functional quality (SERVQUAL)

Consistent with the earlier research, the initial assessment of functional quality involved testing the validity and reliability of the five components of the SERVQUAL instrument. The results of the

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

initial CFA using Sample A indicated that the data fit moderately, but that there was some room for improvement. The SERVQUAL factors were modified based on two criteria. First, the residual values for individual items were examined to determine whether any greater than 0.16. Second, a subsequent review of item wording indicated that there was overlap with six items. Based on the review of residual values and assessment of the wording of each statement, six items were eliminated from the subsequent analysis. The results of the initial CFA using Sample A suggested that 16 items be retained to assess functional quality. The final CFA computed with Sample A indicated that the data fit the model reasonably well, GFI = 0.92, CFI = 0.94, TLI = 0.93. The item (indicator) loadings for functional quality based on Sample A were significant and ranged from 0.53 to 0.87. Evidence of internal consistency was demonstrated through the composite reliability and coefficient alpha scores, ranging from 0.69 to 0.87 (Table I).

The CFA computed using Sample B confirmed the factor structure of functional quality using the retained 16 items; the results indicated that the data fit the model well, GFI = 0.93, CFI = 0.95, TLI = 0.94. The item (indicator) loadings for functional quality using sample B were significant and ranged from 0.52 to 0.89. Evidence of internal consistency was also demonstrated through the composite reliability and coefficient alpha scores, ranging from 0.69 to 0.85 (Table I). The CFA with Sample B confirmed that the SERVQUAL measure had a unique five-factor structure.

Further, a single factor structure composed of all five SERVQUAL components was also analyzed in order to assess the unidimensionality of functional quality. However, the single factor structure provided a much poorer fit, indicating that the SERVQUAL instrument is not unidimensional. It is important to note that the assessment of functional quality discussed to this point only included the five constructs with the corresponding manifest variables. The proposed hierarchical structure of service quality (Figure 1), suggests that the unidimensional nature of functional quality may be captured through a second-order latent variable. Support for a second-order latent variable was also found in the correlations among the SERVQUAL factors. The correlations among the five factors were high, ranging from 0.62 to 0.85 for Sample A and 0.56 to 0.91 for Sample B. Considering the high correlations among five factors it is reasonable to expect that functional quality would be a unidimensional construct having a several unique sub-components. This reasoning led us to conduct additional analysis that is discussed with the assessment of the research model.

CFA for technical quality

CFA was also used to assess the unidimensionality of technical quality. Since the model for technical quality was saturated, the model was identified and no fit indices were provided. The composite reliability and AVE for technical quality were 0.78 and 0.54, respectively, for Sample A. The item (indicator) loadings for the technical quality were significant and ranged from 0.68 to 0.79 for Sample A (Table I). No problematic items were found in the initial CFA using Sample A. Accordingly, no changes were deemed necessary for the structure of technical quality. A second CFA was computed using Sample B. The composite reliability and AVE were 0.72 and 0.46, respectively, for sample B. The item (indicator) loadings were significant and ranged from 0.61 to 0.75 for Sample B (Table I).

CFA for Image

The unidimensionality of Image was initially analyzed using the ten items developed by authors. The initial CFA with Sample A indicated a bad fit with the model. Modifications were made to the Image measures based on assessment of the residual values and item wording. A review of the residual values and item wording indicated that the fit of the model would be improved if six of the items were eliminated. An additional CFA was computed using Sample A with the scale modifications. The results indicated that the data fit the model reasonably well (GFI = 0.97 CFI = 0.97, TLI = 0.91, RMR = 0.04). The composite reliability and coefficient alpha scores, which provide evidence of internal consistency, were 0.87 and 0.86, respectively. The item (indicator) loadings for Image were all significant and ranged from 0.61 to 0.92 (Table I). A CFA was calculated using Sample B with the four Image items that were retained. The results of the CFA (Table I) indicated that the data fit the model well (GFI = 0.99 CFI = 0.99, TLI = 0.97, RMR = 0.02). The composite reliability and coefficient alpha scores, which provide evidence of internal consistency, were 0.83 and 0.82 respectively. The item (indicator) loadings for Image were all significant and ranged from 0.46 to 0.93 (Table I).

CFA for customer satisfaction

The unidimensionality check of the eight items adapted from Oliver and Swan (1989) to measure customer satisfaction was analyzed through CFA. The results from the initial CFA using Sample A indicated that the model did not fit the data.

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

Analysis of the residual values suggested that four items should be eliminated (see the Appendix). The results of the CFA based on four customer satisfaction items, using Sample A, indicated that the data fit the model very well (GFI = 0.99 CFI = 0.99, TLI = 0.99, RMR = 0.01). The adequate evidence of internal consistency and the item (indicator) loadings for customer satisfaction are shown in Table I. A CFA with the four customer satisfaction items was calculated using Sample B. The results indicated that the data fit the model well (GFI = 0.99, CFI = 0.99, TLI = 0.99, RMR = 0.02). The composite reliability and coefficient alpha were 0.74 and 0.70, respectively, and the item (indicator) loadings for the image were all significant and ranged from 0.45 to 0.92 (Table I).

Research model

Path analysis with latent variables was utilized to test the proposed research model. In doing so, the unidimensionality checks discussed above were implemented to satisfy the basic condition for using the composite scores. It is important to acknowledge that for functional (process) quality, the five-factor structure provided a better fit to the data than the single-factor (unidimensional) structure. At the same time, however, the high correlations among the five factors suggests that additional analysis would be appropriate to more fully ascertain the unidimensionality of functional quality.

The presence of distinct factors and high correlations among factors (at least 0.56) was thought to indicate that functional quality may be multi-level and multidimensional. In other words, functional quality was believed to have a second-order factor structure as shown in the shading part of Figure 1. To test this reasoning, a second-order factor model was tested using Sample B and the results indicated that the data provided an adequate fit to the model (GFI = 0.91 CFI = 0.97, TLI = 0.97, RMR = 0.05) (Table II). The results show that the second-order factor model for functional quality provides better fit compared to the result of CFA for SERVQUAL (i.e. functional quality) (Table I). These findings suggest that functional quality is a unidimensional construct having a several unique sub-components. Accordingly, the decision was taken to use a composite score based on the five sub-dimensions to represent the functional quality dimension.

The model suggests that service quality consists of functional (i.e. process) and technical (i.e. outcome) quality dimensions, with image mediating the service quality perception from the consumers' perspective. Since one of the main propositions of this study is the role of image in the service quality perception, two competing models were developed to test the model. The first model includes the role of image; the second competing model was tested with image excluded.

Model fit

The results indicated that the data fit the first model very well (CFI = 0.97, TLI = 0.90 RMR = 0.05) (Table III). On the contrary, the test of the second competing model produced a much poorer fit (GFI = 0.82 CFI = 0.58, TLI = 0.30, RMR = 0.28). The results suggest that the full model including the mediating role of image in the perception of service quality is most appropriate.

Relationships among constructs

The path coefficients for the full model are reported in Table III. All path coefficients are positive and significant. The result shows a positive relationship between functional quality and image ($\gamma_{11} = 0.53$) and technical quality and image ($\gamma_{12} = 0.21$). The direct relationship between functional quality and overall service quality was $\gamma_{21} = 0.25$; the relationship between technical quality and overall service quality was $\gamma_{22} = 0.24$. There was also a positive relationship between image and overall service quality ($\beta_{21} = 0.36$), and between overall service quality and customer satisfaction ($\beta_{32} = 0.41$).

It is necessary to compare the paths leading to overall service quality to understand the role of image in the perception of service quality. That is, if the magnitude of the path between the image and the overall service quality is larger than the individual paths between functional quality/ technical quality and overall service quality, then the role of image as a mediating factor in the perception of service quality would be supported. The results show that the path between image and overall service quality ($\beta_{21} = 0.36$) is larger than the path between functional quality and overall service quality ($\gamma_{21} = 0.25$) and the path from technical quality to overall service quality ($\gamma_{22} = 0.24$), providing support for the European perspective of service quality.

Another point to consider is the direct and indirect effect of functional and technical quality on overall service quality. The total effect of functional and technical quality on the overall service quality were 0.44 and 0.32, respectively. The direct effect of functional and technical quality on the overall service quality were 0.25 and 0.24, respectively. The indirect effect of the dimensions on overall service quality were 0.19 and 0.08, respectively. These results indicate that the magnitude of the indirect effect of the functional dimension on service quality perception is much larger than that of the technical dimension. One implication of this finding is that

Table II The result of second-order factor model – functional quality dimension

	Path	Standardized loading*	Uniqueness
γ_{11}	Functional quality → Reliability	0.71(0.06)	0.49(0.07)
γ_{21}	Functional quality → Responsiveness	0.84(0.08)	0.30(0.06)
γ_{31}	Functional quality → Assurance	0.91(0.08)	0.18(0.05)
γ_{41}	Functional quality → Empathy	0.96(0.06)	0.09(0.03)
γ_{51}	Functional quality → Tangibles	0.86(0.07)	0.27(0.06)
Fit indices		Chi-square = 378.17 df = 99 $p = 0.0001$ GFI = 0.91, CFI = 097, TLI = 0.97, RMR = 0.05	

Note: *Significant $p < 0.01$

Table III The results of structural equation model testing

	Path	Standardized loading*	R^2
γ_{11}	Functional quality → Image	0.53(0.04)	0.43 (IM)
γ_{12}	Technical quality → Image	0.21(0.04)	
γ_{21}	Functional quality → Overall service quality	0.25(0.05)	0.51 (OSQ)
γ_{22}	Technical quality → Overall service quality	0.24(0.04)	
β_{21}	Image → Overall service quality	0.36(0.04)	
β_{32}	Overall service quality → Customer satisfaction	0.41(0.04)	0.17 (SAT)

*Correlation Matrix***

	IM	*OSQ*	*SAT*	*FUN*	*TEC*
IM	–				
OSQ	0.63	–			
SAT	0.41	0.41	–		
FUN	0.63	0.60	0.30	–	
TEC	0.48	0.54	0.33	0.51	–

Fit indices

$\chi^2 = 28.41$, df = 3, $p = 0.0000$,
GFI = 0.98 CFI = 0.97,
TLI = 0.90 RMR = 0.05

Notes: *All significant $p < 0.01$; **FUN = functional quality; TEC = technical quality; IM = image, OSQ = overall service quality; and SAT = Customer satisfaction

the mediating influence of image is influenced more by a consumer's perception of functional quality than technical quality.

Discussion

While several authors have emphasized the multidimensional nature of service quality (Grönroos, 1982; Lehtinen and Lehtinen, 1982; Parasuraman *et al.*, 1985, 1988; Rust and Oliver, 1994), the majority of research pertaining to service quality has focused on the measurement of service quality based on the functional dimension. The current study sought to verify the European perspective that conceptualizes service quality in relation to functional quality, technical quality, and image. Several interesting results emerged from the study. First, the initial results did confirm the five-factor structure of the SERVQUAL instrument. An unique contribution of the study was going beyond the five-factor structure and testing and confirming a second-order latent variable structure for functional quality. The high correlations between the five SERVQUAL factors suggested that the constructs are represented by a second-order latent variable, functional quality.

A second finding of the current study is the confirmation of the multidimensional nature of service quality supporting the European perspective. The results indicated that functional and technical quality influence perceptions of overall service quality. The mediating role of image in one's perception of overall service quality is a third finding of the current study. The results provide empirical support for the importance of image on mediating an individual's perception of overall service quality.

A final finding of the current study is documenting the influence of functional quality on an individual's image of an organization. The direct effects of functional and technical quality on overall service quality were comparable. The results indicated, however, that the effect of functional quality on image was larger than effect of technical quality. These findings suggest that the interaction between a consumer and an organization's representatives does have an important influence on a consumer's image of the

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

organization and subsequent evaluation of service quality.

Managerial implications

The confirmation of the research model has the potential to help managers better understand how customers assess the quality of services. The results from the study suggest that technical quality, functional quality, and image should be measured to fully capture an individual's overall perception of service quality. Traditionally, technical quality has been disregarded since it was believed that customers would not be able to discern the technical quality of services and therefore, they would rely on other attributes associated with the process of service delivery, and functional quality. While functional quality may have a larger influence on perception of service quality for services such as health-care and law, it is important to recognize the differential influence of functional and technical quality, particularly for other service organizations that do not have such high credence properties.

It is also important to include a measure of image when assessing service quality perception. The results from the current study confirm the role of image as a mediating factor in the perception of service quality. One implication of these findings for managers is to assess organizational image as part of an assessment of perceptions of service quality. A positive image makes it easier for a firm to communicate effectively, and it makes people more perceptive to favorable word-of-mouth messages. It is very important for organizations to have a clear, favorable image.

Research implications

By confirming the European conceptualization of service quality, this study has implications for future research. First, the current study adapted the SERVQUAL instrument to measure functional quality. The five sub-dimensions of the instrument did a good job of assessing the service delivery process. It is reasonable to consider, however, that there are other sub-dimensions of service delivery that should be assessed as part of a firm's functional quality.

Second, the current study found that functional quality had a stronger influence on image and overall service quality relative to technical quality. Future research should consider the differential influence of functional and technical qualities with respect to different service offerings.

Some services are very difficult to assess due to high credence properties, while others are easy to assess based on experience and search properties. Additional work should compare the relative influence of functional and technical qualities for different types of services.

Third, the current study focused on one service industry. Limiting the study to a single industry did eliminate problems associated with the effects of industry differences. It is also important to recognize that cell phone services are expected to have higher experience or search properties, allowing for discernment of technical quality by customers. Future research should consider other services in order to ascertain the generalizability of the results presented with the current study. Overall, the findings provide empirical support for the European perspective and provide new implications for the study and assessment of service quality.

Limitations of study

As with any study, several limitations should be noted. First, the study was conducted with Korean consumers. By translating English items into Korean, it is possible that the meaning of some statements may have been unintentionally altered. It is also possible that terms from one language are interpreted differently in another language. Additional research is needed with diverse consumer groups.

Second, this study does not provide a full description for technical quality. The study of technical quality seems to be at an introductory stage. With very little earlier work, it was difficult to fully describe the nature of technical quality. The focus groups and in-depth interviews provide us with initial ideas for measuring technical quality. Subsequent work is needed to more fully develop this dimension. Overall, the results demonstrate the importance of image as a dimension of service quality, and the necessity of continuing to extend our understanding of service quality.

References

Anderson, J. and Gerbing, D. (1988), "Structural equation modeling in practice: a review and recommended two step approach", *Psychological Bulletin*, Vol. 103, pp. 411-23.

Asubonteng, P., McCleary, K.J. and Swan, J.E. (1996), "SERVQUAL revisited: a critical review of service quality", *Journal of Services Marketing*, Vol. 10 No. 6, pp. 62-81.

Babakus, E. and Boller, G.W. (1992), "An empirical assessment of the SERVQUAL scale", *Journal of Business Research*, Vol. 24, pp. 253-68.

Bagozzi, R.P. and Heatherton, T.F. (1994), "A general approach to representing multifaceted personality construct: application to state self-esteem", *Structural Equation Modeling*, Vol. 1 No. 1, pp. 35-67.

Baker, J.A. and Lamb, C.W. Jr (1993), "Measuring architectural design service quality", *Journal of Professional Services Marketing*, Vol. 10 No. 1, pp. 89-106.

Bitner, M.J. (1992), "Servicescapes: the impact of physical surroundings on customers and employees", *Journal of Marketing*, Vol. 56, pp. 57-71.

Brady, M.K. and Cronin, J.J. Jr (2001), "Some new thoughts on conceptualizing perceived service quality: a hierarchical approach", *Journal of Marketing*, Vol. 65, pp. 34-49.

Brown, T.J., Churchill, G.A. and Peter, J.P. (1993), "Research note: improving the measurement of service quality", *Journal of Retailing*, Vol. 69 No. 1, pp. 126-39.

Buttle, F. (1996), "SERVQUAL: review, critique, research agenda", *European Journal of Marketing*, Vol. 30 No. 1, pp. 8-32.

Carman, J.M. (1990), "Consumer perceptions of service quality: an assessment of the SERVQUAL dimensions", *Journal of Retailing*, Vol. 66, pp. 33-55.

Cronin, J.J. Jr and Taylor, S.A. (1992), "Measuring service quality: a re-examination and extension", *Journal of Marketing*, Vol. 56, pp. 55-68.

Dabholkar, P., Thorpe, D.I. and Rentz, J.O. (1996), "A measure of service quality for retail stores: scale development and validation", *Journal of the Academy of Marketing Science*, Vol. 24 No. 1, pp. 2-16.

Gerbing, D. and Anderson, J. (1988), "An updated paradigm for scale development incorporating unidimensionality and its assessment", *Journal of Marketing research*, Vol. 25, pp. 186-92.

Grönroos, C. (1982), *Strategic Management and Marketing in Service Sector*, Marketing Science Institute, Cambridge, MA.

Grönroos, C. (1990), *Service Management and Marketing*, Lexington Books, Lexington, MA.

Grönroos, C. (2001), "The perceived service quality concept – a mistake?", *Managing Service Quality*, Vol. 11 No. 3, pp. 150-2.

Hunter, J.E. and Gerbing, D.W. (1982), "Unidimensional measurement, second-order factor analysis, and causal models", in Staw, B.M. and Cummings, L.L. (Eds), *Research in Organizational Behavior*, Vol. 4, pp. 267-99.

John, G. (1984), "An empirical investigation of some antecedents of opportunism in a marketing channel", *Journal of Marketing research*, Vol. 21 No. 3, pp. 278-89.

Jöreskog, K.G. (1971), "Statistical analysis of sets of congeneric tests", *Psychometrika*, Vol. 32, pp. 443-82.

lehtinen, J.R. and lehtinen, U. (1982), "Service quality: a study of quality dimensions", unpublished Working Paper, Service Management Institute, Helsinki.

Mangold, G.W. and Babakus, E. (1991), "Service quality: the front-stage perspective vs the back-stage perspective", *Journal of Services Marketing*, Vol. 5 No. 4, pp. 59-70.

McDonald, R.P. (2002), *Structural Model for the Multivariate Data*, Lawrence Erlbaum Associate, NJ.

McDougall, G.H.G. and Levesque, T.J. (1994), "A revised view of service quality dimensions: an empirical investigation", *Journal of Professional Services Marketing*, Vol. 11 No. 1, pp. 189-209.

Oliver, R.L. (1993), "A conceptual model of service quality and service satisfaction: compatible goals, different concepts", in Swartz, T.A., Bowen, D.E. and Brown, S.W. (Eds), *Advances in Service Marketing and Management: Research and Practice*, JAI Press, Greenwich, CT, pp. 65-85.

Oliver, R.L. and Swan, J.E. (1989), "Consumer perceptions of interpersonal equity and satisfaction in transaction: a fields survey approach", *Journal of Marketing*, Vol. 53, pp. 21-35.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 49, pp. 41-50.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988), "SERVQUAL: a multiple item scale for measuring customer perceptions of service quality", *Journal of Retailing*, Vol. 64, pp. 12-40.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1994), "Moving forward in service quality research: measuring different levels of customer expectations, comparing alternative scales, and examining the performance-behavioral intentions Link", Marketing Science Institute working paper, Report No. 94-114 September 1994.

Powpaka, S. (1996), "The role of outcome quality as a determinant of overall service quality in different categories of services industries: an empirical investigation", *Journal of Services Marketing*, Vol. 10 No. 2, pp. 5-25.

Richard, M.D. and Allaway, A.W. (1993), "Service quality attributes and choice behavior", *Journal of Services Marketing*, Vol. 7 No. 1, pp. 59-68.

Rust, R.T. and Oliver, R.L. (1994), "Service quality: insights and managerial implications from the frontier", in Rust, R.T. and Oliver, R.L. (Eds), *Service Quality: New Directions in Theory and Practice*, Sage Publications, Thousand Oaks, CA, pp. 1-19.

Spangenberg, E.R., Crowley, A.E. and Henderson, P.W. (1996), "Improving the store environment: do olfactory cues affect evaluations and behaviors?", *Journal of Marketing*, Vol. 60, pp. 67-80.

Swartz, T.A. and Brown, S.W. (1989), "Consumer and provider expectations and experiences evaluating professional service quality", *Journal of the Academy of Marketing Science*, Vol. 17 No. 2, pp. 189-95.

Taylor, S.A. and Baker, T.L. (1994), "An assessment of the relationship between service quality and customer satisfaction in the formation of consumers' purchase intentions", *Journal of Retailing*, Vol. 70 No. 2, pp. 163-78.

Teas, R.K. (1993), "Expectations, performance evaluation and consumers perception of quality", *Journal of Marketing*, Vol. 57, pp. 18-34.

Zeithaml, V.A. (1987), *Defining and Relating Prices, Perceived Quality and Perceived Value*, Marketing Science Institute, Cambridge, MA.

Further reading

Bentler, P.M. and Cho, C. (1988), "Practical issues in structural modeling", in Long, J.S. (Ed.), *Common Problems/Proper Solutions: Avoiding Error in Quantitative Research*, Sage, Newbury Park, CA, pp. 161-92.

Appendix

Reliability

(1) Providing services as promised[a].
(2) Dependability in handling customers' service performed[a].
(3) Performing the services right the first time.
(4) Providing services at the promised time.
(5) Maintaining error-free records.

Responsiveness

(1) Keeping customers informed about when services will be performed[a].

Managing Service Quality
Volume 14 · Number 4 · 2004 · 266–277

(2) Prompt service to customers.
(3) Willing to help customers.
(4) Readiness to respond to customers' requests.

Assurance
(1) Employees who instill confidence in customers[a].
(2) Making customers feel safe in their transaction.
(3) Employees who are consistently courteous.
(4) Knowledgeable employee to answer customer questions.

Empathy
(1) Giving customers individual attention.
(2) Employees who deal with customers in a caring fashion.
(3) Having the customer's best interest at heart.
(4) Employees who understand the needs of their customers.
(5) Convenient business hour[a].

Tangibles
(1) Modern equipment.
(2) Visually appealing facilities.
(3) Employees who have a neat, professional appearance.
(4) Visually appealing materials associated with the service[a].

Technical quality
(1) It is successful to complete a call.
(2) There is no noise during the call.
(3) The call can be completed without the interruption.

Image
(1) It is a reliable company.
(2) It provides an excellent service to customers.
(3) It is a successful company[a].
(4) It makes a lot of contribution to the society.
(5) It has an superior technology in cell phone service[a].
(6) It is sincere to the customers.
(7) It has a good reputation[a].
(8) It is a large-scale company[a].
(9) It is familiar to the customers[a].
(10) It is honest[a].

Customer satisfaction
(1) The services have not worked out as well as I thought it would[a].
(2) I am satisfied with my decision to use this service[a].
(3) Sometimes I have mixed feelings about keeping it.
(4) My choice to use this service was a wise one.
(5) If I could do it over again, I'd choose a different company[a].
(6) I feel bad about my decision to use this service.
(7) I am not happy that I used this service.
(8) Using this service has been a good experience[a].

Note: [a]represents an item removed after the CFA.