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WORKING PAPER

Development of a measurement scale for business-to-business service quality: assessment in the facility services sector

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INTRODUCTION

The prominence of business services in the global economy has become self-evident. The amount of money involved in sales of products and services to business buyers are ever-increasing and much higher than those to individual consumers (Kotler, 2003, Jackson and Cooper, 1988). As organizations have increasingly invested in the business services sector with the hope of gaining sustained competitive advantage, the delivery of quality service has taken on an important role in the strategic planning of service organizations (Westbrook and Peterson, 1998). Since service quality has become the overriding concern of purchasers of business services, service providers focused on not only surviving but also thriving in turbulent national and international markets by delivering a certain level of service quality (Jackson and Cooper, 1988). However, the management of service quality in a business-to-business (B2B) environment is not as widely discussed in literature as it is in the business-to-consumer (B2C) context (Parasuraman, 1998, White and Galbraith, 2000). The most widely spread instrument to measure service quality in a B2C environment is the SERVQUAL scale developed by Parasuraman, Zeithaml and Berry (1988). Researchers who applied this scale in B2B environment were not always successful (Brensinger and Lambert, 1990) indicating that the SERVQUAL scale might not be directly transferable to the business sector (Durvasula, Lysonski and Mehta, 1999). This could be due to the contrast between business markets and consumer markets (Kotler, 2003) wherein business services and their marketing are regarded as being more complex (Jackson and Cooper, 1988). Even the dimensions of perceived service quality (the basis for service quality measurement) are considered to be different across the two service settings (Kong and Mayo, 1993). Thus, the development of a measurement scale for perceived service quality adjusted to the needs of the business context appears imperative.

In this study we develop a scale to measure the perceived service quality in business settings. The study is based on the exploratory research of Westbrook and Peterson (1998). Consistent with the B2B service quality dimensions they defined, we draw up a scale to actually measure the perceived service quality in a business environment. This newly developed scale will be called the B2B SERVQUAL scale. The SERVQUAL scale developed by Parasuraman, Zeithaml and Berry (1988) will occasionally be called the B2C SERVQUAL scale to avoid confusion. Thus, the research focus of this study can be formulated as follows:

To develop and test a reliable, valid instrument for measuring perceived service quality in a B2B setting and determine its dimensions

This research focus evokes other questions like which service quality dimensions need to be added to the B2C service quality dimensions to more completely encompass the perceived service

quality in a business setting and accordingly are there specific B2C service quality dimensions that are unimportant in a B2B environment. Additionally, we are interested in identifying service quality dimensions that have the most influence on perceived service quality in a business context. The newly developed B2B SERVQUAL scale will help us to gain new insights into not only measuring perceived service quality in a B2B setting, but also in managing the service quality in such an environment thereby improving the service relationship between companies. In this research study the emphasis will be on how service quality is perceived in the facility services sector, like cleaning, catering and security.

In the following section we give a short overview of the research on B2C SERVQUAL scale (Parasuraman, Zeithaml and Berry, 1988) and its applicability in a business environment. This section also gives a short overview of the current research done on perceived service quality in a B2B environment and addresses the issue of the dimensions needed to capture perceived service quality in a B2B context. These dimensions are defined and compared with those in a B2C context. Subsequently we discuss the methodology used to assess the B2B SERVQUAL scale. The analyses and results are then described in another section. In the last section the limitations of our study are mentioned. This section also covers the discussion of the results and gives possibilities for future research.

THEORETICAL BACKGROUND

The concept of service quality

In general, the concept service quality is defined as 'a form of attitude representing a long-run, overall evaluation' (Bitner, 1990, Patterson and Johnson, 1993). This conceptual definition is valid in both the B2C and B2B context and the measurement of the service quality concept is mostly based on its dimensions or determinants (Parasuraman, Zeithaml and Berry, 1988). However, the dimensions of service quality perceived by an industrial firm or by an individual customer may not totally overlap each other (Kong and Mayo, 1993)

Based on focus group interviews with customers and in-depth interviews with executives in consumer sectors like retail banking and product repair and maintenance, Parasuraman, Zeithaml and Berry (1985) defined ten dimensions of service quality: tangibles, reliability, responsiveness, competence, access, courtesy, communication, credibility, security and understanding the customer. Table 1 gives an overview of these dimensions and their definitions. Subsequent research (Parasuraman, Zeithaml and Berry, 1988) revealed only five dimensions. Tangibles, reliability and responsiveness remain the same, while assurance and empathy encompass the other seven dimensions (cf. infra).

In the past, it has been assumed that the service quality dimensions found in consumer settings could be applied to business markets as well (Holmlund and Kock, 1995). However, in a B2B environment other determinants may play a role in perceived service quality than the ones found in a B2C context. Kong and Mayo (1993) stated that reliability and responsiveness may also be important in a business setting, but a dimension dealing with innovativeness can be as important. In their study, Babakus, Pedrick and Richardson (1995) observed that price could be another indicator of a dimensional conceptualization of perceived service quality. The most elaborate research for the determinants of perceived service quality in a business setting was published by Westbrook and Peterson (1998). In an exploratory study, they interviewed business customers of risk management services to assess their perceptions of quality. The researchers discovered twelve dimensions or determinants for perceived service quality in a B2B environment: responsiveness, competence, consultative selling, reliability, price, interpersonal skills, accessibility, credibility, product offering, market clout, geographical presence and tangibles. The definition of these dimensions can be found in table 1.

The comparison of the ten dimensions of perceived service quality initially defined by Parasuraman, Zeithaml and Berry (1985) (B2C dimensions) and the twelve dimensions for perceived service quality in a business setting defined by Westbrook and Peterson (1998) (B2B dimensions) reveals that some of the dimensions defined in a consumer context also appear in a business context, like reliability, responsiveness, competence, accessibility, and credibility (see table 1). However, not all the dimensions are similar across the two different settings. The B2C tangibles dimension encompasses the physical evidence of the service, while the B2B tangibles dimension stresses the tangible support for service delivery, e.g. offering on-line computer services. Moreover, the B2B dimension 'consultative selling' is more than just understanding the needs of the customer. It involves the service provider's ability to embed within the customer's operations; this means establishing relationships, incurring risks, absorbing responsibilities for the client, offering advice, training or education… As such, the consultative selling dimension covers the two B2C dimensions 'security' and 'understanding the customer'. The B2B dimension 'interpersonal skills' encompasses the willingness to communicate and the courtesy of the service provider, thus it also includes two B2C dimensions, namely 'courtesy' and 'communication'. The research of Westbrook and Peterson (1998) also revealed four dimensions which were not indicated by Parasuraman, Zeithaml and Berry (1985): price, product offering, market clout and geographical presence.

INSERT TABLE 1 ABOUT HERE

This comparison between the determinants of perceived service quality in a consumer (Parasuraman, Zeithaml and Berry, 1985) versus a business (Westbrook and Peterson, 1998) setting confirms the previous research of Kong and Mayo (1993) and Babakus, Pedrick and Richardson (1995): in a B2B environment other determinants may play a role in perceived service quality.

Until now, the instrument to measure perceived service quality that is most widely spread, in academic research but also in practice (Lam and Woo, 1997), is the SERVQUAL scale developed by Parasuraman, Zeithaml and Berry in 1988 (Parasuraman, Zeithaml and Berry, 1988). This measurement of perceived service quality by means of SERVQUAL, is based on the service quality dimensions (Parasuraman, Zeithaml and Berry, 1988). As those dimensions are not the same in a consumer versus a business context (cf. supra), the measurement of perceived service quality in a B2B context needs to include other determinants than those used in a B2C context. In this study, we develop a scale, called the B2B SERVQUAL scale, to measure the perceived service quality in a B2B environment, based on the business dimensions as defined by Westbrook and Peterson (1998). The B2B SERVQUAL scale will also be used to investigate whether new dimensions need to be added to more completely assess perceived service quality and which dimensions have the most influence on perceived service quality in a B2B setting.

In the next part we will describe the B2C SERVQUAL instrument, briefly discuss its use and mention the main criticism on its applicability. In a subsequent part we will give an overview of its use in a business context and point out the need to establish a service quality measurement instrument adjusted to the business environment and the B2B service quality dimensions.

SERVQUAL to measure service quality

Parasuraman, Zeithaml and Berry (1988) developed a scale, SERVQUAL, for the assessment of the gap between perceptions and expectations of service quality based on data from 4 firms delivering service to the individual customer. The scale is claimed by its originators (Parasuraman, Zeithaml and Berry, 1988) to be usable across different service sectors and consists of a 22-item questionnaire. The respondents give for each of the 22 items their expectation for the service in general and their perception for a specific service provider. The difference between expectation and perception (gap score) is an indication of the quality delivered by the service provider. This scale reveals five dimensions of perceived service quality: tangibles (4 items), reliability (5 items), responsiveness (4 items), assurance (4 items) and empathy (5 items). Tangibles are defined as physical facilities, equipment, and appearance of personnel. Reliability indicates the ability to perform the promised service dependably and accurately and responsiveness is the willingness to help customers and provide prompt service. Assurance encompasses the knowledge and courtesy of employees and

their ability to inspire trust and confidence and empathy is defined as the caring, individualized attention the firm provides its customers (Parasuraman, Zeithaml and Berry, 1988).

The years after the introduction of SERVQUAL some criticisms have emerged (for a review of some of the SERVQUAL research see Asubonteng, McCleary and Swan, 1996). At the same pace, attempts to justify or improve the scale were produced (Parasuraman, Zeithaml and Berry, 1991, Parasuraman, Zeithaml and Berry, 1994a). The criticisms which still stand today can be divided into two main groups: the use of the disconfirmation paradigm and the dimensionality of the scale.

The disconfirmation paradigm relates to the subtraction of scores on one measurement (perceptions) from another measurement (expectations) to create a new variable (service quality) which is used in subsequent data analysis (Brown, Churchill and Peter, 1993). First of all, a number of researchers agree that the measurement of expectations is problematic (Carman, 1990). Moreover, the usefulness of expectations in terms of explanatory power is questioned (Cronin and Taylor, 1992, Cronin and Taylor 1994, Teas, 1993). Even the originators of the scale indicate the superiority of the perceptions-only measure from a purely predictive validity standpoint (Parasuraman, Zeithaml and Berry, 1994b).

The second criticism concerning the disconfirmation paradigm relates to the problems with conceptualizing service quality in such a manner. Many researchers are convinced that the use of a difference score for the measurement of perceived service quality is inappropriate (Carman, 1990, Cronin and Taylor, 1992, Babakus and Boller, 1992), because of variance restriction problems and the correlation between the difference-score and the perception and expectation scores (Brown, Churchill and Peter, 1993, Peter, Churchill and Brown, 1993).

The dimensionality of SERVQUAL is also questioned by a number of researchers. First, the number of service quality dimensions is examined. Some researchers argue that more dimensions should be added (Carman, 1990), while others state that perceived service quality is a one-dimensional construct (Cronin and Taylor, 1992, Cronin and Taylor, 1994, Brown, Churchill and Peter, 1993, Babakus and Boller, 1992). The one-dimensional conceptualization of service quality can be explained by the overlap among certain dimensions (Parasuraman, Zeithaml and Berry, 1994a) and the dependence of the dimensions (Mehta and Durvasula, 1998). Furthermore, the item-factor relationship appeared less stable than expected across different service settings (Carman, 1990, Asubonteng, McCleary and Swan, 1996): an item does not always load heavily on the dimension it is supposed to. Secondly, the service quality dimensions are not considered to be generic, because in certain service settings some items and/or factors should be added to encompass the complete perceived service quality construct (Carman, 1990, Brown, Churchill and Peter, 1993).

Despite the ongoing critique, the instrument has been used in diverse service sectors and is currently the most popular standardized questionnaire to measure service quality (Caruana, Ewing and Ramaseshan, 2000). Some of the sectors where SERVQUAL has been used are banking (Parasuraman,

Zeithaml and Berry, 1988, Cronin and Taylor 1992) and financial institutions (Brown, Churchill and Peter, 1993), pest control (Cronin and Taylor, 1992), dry cleaning (Cronin and Taylor, 1992), fast food restaurants (Cronin and Taylor, 1992), electric and gas utilities (Babakus and Boller, 1992), health care institutions (Carman, 1990), retail stores (Finn and Lamb, 1991) and many more.

Use of SERVQUAL in a B2B context

Although SERVQUAL is the most widely spread service quality measurement, empirical research that uses this scale in a business setting is, compared to the use in a B2C context, very rare (Parasuraman, 1998, Kong and Mayo, 1993). Some of the exceptions that measured perceived service quality in a business setting by means of this instrument include the after sales services for software (Pitt, Morris and Oosthuizen, 1996), airline catering services industry (Babakus, Pedrick and Richardson, 1995), motor carrier services (Brensinger and Lambert, 1990) and ocean freight services (Durvasula, Lysonski and Mehta, 1999).

One of the reasons for this limited business use of SERVQUAL is formulated by Parasuraman (1998), one of the originators of the SERVQUAL scale, in his agenda for research in business markets: "Are all five generic SERVQUAL dimensions necessary – and are they sufficient – to capture effectively the components of service rendered to business customers?" This remark is also found in other research which tried to implement SERVQUAL in a business context (Kong and Mayo, 1993). This statement has been empirically validated as well. Brensinger and Lambert (1990) found that the SERVQUAL dimensions only explained less than 40% of the variation associated with overall perceived quality in a B2B environment. Therefore, the scale is of questionable value for designing action plans to improve service quality in a business context (Brensinger and Lambert, 1990). Other researchers did use the SERVQUAL scale to measure the perceived service quality in a business setting, but this went never smoothly. According to Pitt, Morris and Oosthuizen (1996), the reliability and validity of the SERVQUAL scale scored well, although the discriminant validity was somewhat problematic. Farley, Daniels and Pearl (1990) used an enhanced SERVQUAL scale to improve the scale's results in a business environment. Young and Varble (1997) mentioned no problems with their business use of the SERVQUAL scale, but the only validity test described was the overall reliability coefficient of the 22 items. SERVQUAL proved to be a viable guide for the airline catering services industry, as indicated by the research of Babakus, Pedrick and Richardson (1995), although they remarked that adding some attributes related to price to the SERVQUAL scale might have had an added value in their research design. One of the latest studies which attempted to use the SERVQUAL scale in a B2B environment explicitly questioned its applicability to this sector. Durvasula, Lysonski and Mehta (1999) suggested that the instrument for measuring service quality, named SERVQUAL, might give an indication of what were the important attributes associated with a specific service and

the quality delivered, but it might not be directly transferable to the B2B sector, because of differences between consumer and business context.

Besides the limited use of SERVQUAL in a business setting, another remarkable finding is that this scale has never been used across different B2B industries in one research setting, while this has been the case in the B2C environment (Parasuraman, Zeithaml and Berry, 1988, Carman, 1990, Cronin and Taylor, 1992). This also indicates the lack of critical assessment of the SERVQUAL scale in a business setting.

The somewhat unsuccessful attempts at using the B2C SERVQUAL scale in a business setting require the development of a new SERVQUAL scale, adjusted to the needs of the business environment. In our study, the items defined by Parasuraman, Zeithaml and Berry (1988) are replaced by items that refer more to a business environment. Moreover, the five dimensions defined by Parasuraman, Zeithaml and Berry (1988) are transformed and expanded with other dimensions that seem to play a role in the perceived service quality of a B2B setting, based on the research of Westbrook and Peterson (1998).

METHODOLOGY

First, we discuss how the B2B SERVQUAL has been established. Afterwards we describe how the data have been collected.

Drawing up the B2B SERVQUAL

As the literature reveals, the concept of service quality covers more dimensions in a business than in a consumer environment, and as the instrument to measure service quality, SERVQUAL, can not be transformed to the B2B setting without adjustments (Durvasula, Lysonski and Mehta, 1999), we seek to develop a new scale, B2B SERVQUAL, to tackle these problems.

The basic concepts of the B2B SERVQUAL scale are conform to those of Parasuraman, Zeithaml and Berry (1988). The concept 'perceived service quality' is measured as a multidimensional construct with several items for each dimension. However, during the development of the new scale, some of the criticisms about SERVQUAL are taken into account. The first major criticism deals with the disconfirmation paradigm (expectations minus perceptions gap) to measure service quality. This method has been highly questioned by previous research (Carman, 1990, Cronin and Taylor, 1992, Babakus and Boller, 1992, Brown, Churchill and Peter, 1993). Moreover, perceptions seem to be a stronger predictor of service quality (Cronin and Taylor, 1992, Caruana, Ewing and Ramaseshan.,

2000). Furthermore, it is considered impractical to ask respondents, especially business managers, to fill out two surveys in a row. Therefore, we have opted not to use the gap score and to ask only for the respondents' perceptions of service quality, as suggested by Cronin and Taylor (1994) and confirmed by Brady, Cronin and Brand (2002). The second major criticism, about the dimensionality of the scale, will be handled in the discussion section.

The content of the scale, i.e. the items, is based on the exploratory research of Westbrook and Peterson (1998). In their research, they asked industrial customers of risk management services opened-ended questions to assess each interviewee's personal perceptions of service quality. Based on these responses, they defined twelve dimensions of service quality. Each dimension was defined and the diverse character of each dimension was illustrated by characteristics which described that dimension more in detail (cf. the dimensions' description written by Parasuraman, Zeithaml and Berry in 1985). From the dimensions' definitions, and especially from the detailed characteristics, items were derived to cover each of the twelve dimensions in the measurement scale, with a total of 46 items for the twelve dimensions (The items initially used in the B2B SERVQUAL scale can be found in appendix 1). Two dimensions were worded negatively (7 items) in accordance with recommended procedures for scale development (Churchill, 1979). The respondents were asked to indicate on a seven-point likert scale to what degree the service provider fitted these statements. Each possible answer was accompanied with a label from totally disagree (point 1) to totally agree (point 7).

All twelve service quality dimensions as defined by Westbrook and Peterson (1998), were included in the survey, although our research setting differs from theirs. At a first glance, some items or dimensions might appear less important for facility services than for risk management services. However, as we want to develop a measurement scale applicable across different B2B service sectors, all dimensions were covered in the B2B SERVQUAL scale.

Data collection

The data collection for this research was established by sending out questionnaires. The survey was sent to a pool of managers, spread over different companies, who were responsible for the facility services (like catering, cleaning, security…) purchased from an external service provider. The internal delivery of facility services was excluded from this research. When the managers were responsible for more than one facility service, they could choose which kind of service (service provider) they would like to evaluate. The surveys were sent out by email to approximately 1300 managers. The manager could send back the questionnaire by email, fax or snail mail. We received 225 reactions, of which 201 filled out a survey. 197 questionnaires were usable; this is a response rate of 15,16%. The received questionnaires were analyzed anonymously.

The survey not only encompassed the B2B SERVQUAL scale as described above. Other questions included the kind of service delivery the respondents were going to evaluate, with possible answers like catering, cleaning, security… The job position of the respondents was also asked for (opened-ended question). The overall service quality perception could be indicated on a seven-point likert scale ranging from very poor to very good. A question about the renewal of the contract could be answered by Yes, No or No idea. We also asked how long the company was a customer of the current service supplier (number of years). Finally, the respondents could indicate on a seven-point likert scale how satisfied they were with the service delivered (from very dissatisfied to very satisfied).

RESULTS

Factor Structure of the B2B SERVQUAL

One of the objectives of this research is to investigate whether the scale set up based on the research of Westbrook and Peterson (1998) is a valid instrument to measure the dimensions of perceived service quality in a business environment. Therefore, we examine the dimensionality of the 46 item B2B SERVQUAL scale by factor analyzing the perceptions score (the respondent's expectations were not asked)[3]. Afterwards reliability and validity of the scale will be assessed.

For the factor analysis, the principal components procedure was used. As the different factors of perceived service quality are not supposed to be independent (Parasuraman, Zeithaml and Berry, 1988), we chose for an oblique rotation[4] instead of an orthogonal rotation. No constraints for the number of factors were imposed (exploratory factor analysis – the number of factors retained were those with eigenvalues greater than one). The results revealed a clear factor pattern with 10 different factors, but some of the items did not have any loading higher than 0.40 on one of the dimensions. In a first step, these presumably irrelevant factors were deleted and we reran the factor analysis under the same conditions. The resulting factor pattern still contained 10 factors, but because of the deletion of the previous items, some of the other items had a relatively low loading (lower than 0.40) on their first dimension (highest loading) and a relatively high loading on another dimension (higher than 0.30). To increase the reliability of the scale, these items were also deleted. In a last step, we deleted some items which didn't have any loading higher than 0.50 to boost the scale's reliability. The final factor pattern consisted of 8 factors and 29 items. The total variance explained by those eight dimensions was 74.65%. The factor loadings of the items on the dimensions are illustrated in table 2. Each item has a

[3] We remark that prior to the data analysis, the scale values were reversed for negatively worded statements in the B2B SERVQUAL scale.
[4] For the oblique rotation, the OBLIMIN procedure in SPSS 11.01 was used.

loading on its factor of 0.55 or higher and the loadings on other factors are all lower than 0.30. Thus, the resulting factor pattern exposes a clear 8 dimensional construct.

INSERT TABLE 2 ABOUT HERE

The overall fit of the 8 dimensional construct was further examined conducting a confirmatory factor analysis[5]. Based on Hair et.al. (1998), absolute as well as incremental fit measures were used to evaluate the fit of the model (see table 3). The chi-square value of 617.82 was statistically significant at the 0.000 level, but when the chi-square value was adjusted by the ratio of degrees of freedom (df=349) a recommended acceptance level was reached (χ^2/df <2). Therefore, other absolute fit measures were examined. The Goodness-of-Fit Index (GFI) is lower than the recommended level of 0.90, but the Root Mean Square Error of Approximation is situated between 0.05 and 0.08 and thus deemed acceptable. According to Gerbing and Anderson (1992), the comparative fit index (CFI) is one of the best suitable incremental fit indexes, while Hair et.al. (1998) claim the normed fit index (NFI) to be the more popular one. Both the NFI and the CFI index are between 0.9 and 1, indicating that the overall incremental fit is satisfactory. The Tucker-Lewis index also exceeds the minimum acceptable value of 0.90, but the Adjusted Goodness-of-Fit Index (AGFI) stays below the acceptance level of 0.90. These results indicate that the model provides good fit statistics, except for the GFI and the AGFI. In the discussion section, some adjustments to further improve the overall fit are formulated.

INSERT TABLE 3 ABOUT HERE

The eight dimensions of the B2B SERVQUAL were named based on the dimensions of Westbrook and Peterson (1998). Two of the B2B SERVQUAL dimensions encompass more than one dimension of Westbrook and Peterson (1998). The first dimension (Dim1) contains items of the reliability, responsiveness and accessibility dimensions as defined by Westbrook and Peterson (1998). Also the dimensions market clout and geographical presence belong to one dimension (Dim2). Because of the shift in items which had taken place, two dimensions were given a new name 'spreading of risks' (Dim4) and 'technical support by service provider' (Dim8).

The reliability of the B2B SERVQUAL scale and its dimensions was studied by calculating the Cronbach alphas (Churchill, 1979). An overview of the dimensions and their corresponding reliability coefficients can be found in table 4. All dimensions, except one, have a reliability of 0.70 or higher which is considered acceptable (Nunnally and Bernstein, 1994) and six of them (Dim1, Dim2, Dim3, Dim5, Dim6, Dim7) have a high reliability (above 0.80). The reliability of the dimension

[5] For the confirmatory factor analysis, LISREL 8.54 (Jöreskog and Sörbom, 2003) was used.

'Spreading of risks' (Dim4) is above 0.60, thus low but acceptable. The total-scale reliability (29 items) of the B2B SERVQUAL scale is 0.89.

INSERT TABLE 4 ABOUT HERE

Validity of the B2B SERVQUAL

The high reliability coefficients of the 8 dimensions provide some support for the B2B SERVQUAL scale's validity, but other conditions are necessary to assess the scale's face and construct validity. Construct validity can be assessed by its convergent validity, its discriminant validity and the expected behaviour in relation to other constructs (Churchill, 1979).

Face or content validity deals with the extent to which the content of the scale is representative of the construct measured. Our scale is based on the exploratory research of Westbrook and Peterson (1998) to define the determinants of perceived service quality in a business setting, which gives an indication of good content validity.

Convergent and discriminant validity are examined using the correlation matrix of B2B SERVQUAL items as presented in table 5, conform Bagozzi's (1981) rules for "convergence" and "discrimination" in measurement. Convergence in measurement refers to the degree in which measures of the same dimension correlate highly with each other in a uniform pattern (Bagozzi, 1981). Discrimination in measurement refers to the extent to which items of a distinct dimension correlate at a lower level with items representing another dimension than with items representing the distinct dimension (Bagozzi, 1981). In table 5 the correlations indicating convergence in measurement are shown in bold (within-dimension correlation), the other correlations are an indication of discrimination in measurement (cross-dimension correlation). A careful examination of the within-dimension correlations reveals that the items possess a highly significant correlation at an acceptable level with items of the same dimension. According to the rules of Bagozzi (1981), each within-dimension correlation should also be higher than the corresponding cross-dimension correlations. However, we note that 4 out of 29 items (item 4, 10, 24 and 33) have at least one cross-dimension correlation which is higher than the lowest within-dimension correlation. All other items have higher within-dimension correlations than cross-dimension correlations. In order to make an overall assessment we computed for each item the convergent validity (CV) by averaging the within-dimension correlations and the discriminant validity (DV) by averaging the cross-dimension correlations, as shown in table 5. These results reveal a high average within-dimension correlation and a lower average cross-dimension correlation for each B2B SERVQUAL item. When the cross-

dimension correlations were computed for each separate dimension[6] (and not across all dimensions), the same conclusion still stands: all items – even items 4, 10, 24 and 33 – had a higher average within-dimension correlation than each average cross-dimension correlation. Therefore, we conclude that the B2B SERVQUAL scale has a good convergent and discriminant validity.

INSERT TABLE 5 ABOUT HERE

Validity is also assessed by examining whether the measured construct is empirically associated with measures of other conceptually related variables and behaves as expected in relation to these constructs (Churchill, 1979) (nomological validity). In our questionnaire respondents were asked to indicate whether they would renew the contract of their current service provider or not. We would expect that customers who perceive the quality of the service being delivered as good to very good will have more intention to renew the current contract than customers who have a lower perception of the service quality. The non parametric test was for each dimension, except for the dimension 'market clout and geographical presence', significant at 0.01 level and the behaviour of these dimensions was as expected (higher score on the dimension when the contract would be renewed). This is another indication of the construct's validity, but the dimension 'market clout and geographical presence' can pose a problem for the scale's validity (cf. infra).

In order to empirical assess another aspect of the scale's validity we examine the association between the B2B SERVQUAL dimensions' scores and the overall quality perception rating using one way ANOVA. In our questionnaire respondents were asked to rate the service provider's overall service quality on a 7 point likert scale. Few respondents checked the first three categories 'very poor', 'poor' and 'rather poor'. Therefore we combined these three categories into one category 'poor'. The dependent variable consisted of the perception scores on each of the eight dimensions. All dimensions, except for the dimension 'market clout and geographical presence' (Dim2), had a significant ANOVA result at 0.000 level[7]. These significant ANOVA results were investigated further using the Tukey HSD for equal variances assumed (dimension 3, 6 and 8) and the Dunnett T3 for equal variances not assumed (dimension 1, 4, 5 and 7 – based on the Levene's test of Homogeneity of Variances). The results are reported in table 6. The score in the 'good' category is for most of the dimensions significantly higher than the score in the 'rather good' category. For the dimension 'Spreading of risks' (Dim4), the score in the 'rather good' category is higher than in the 'neutral' category. This link between the overall quality score and the scores on the dimensions is an indication of good validity,

[6] These calculations were based on the figures in table 5, but are not shown because of the enormous amount of data.
[7] When the corresponding non parametric test – Kruskall Walis for k independent samples – was used, the same significances appeared.

although the lack of this link for the dimension 'market clout and geographical presence' can be problematic (cf. infra).

INSERT TABLE 6 ABOUT HERE

To further assess the impact of the B2B SERVQUAL dimensions on perceived service quality, each dimension is regressed on the dependent variable 'overall quality perception'. The results of these simple regressions are reported in table 7. Again we notice that the dimension 'market clout and geographical presence' has no impact on perceived service quality (cf.infra). The other dimensions have a very significant impact on the dependent variable with adjusted R^2 ranging from 0.08 until 0.53. The reliability, responsiveness and access dimension (Dim1) has the highest impact on perceived service quality (adjusted R^2 of 0.53).

INSERT TABLE 7 ABOUT HERE

A possible threat of this scale's validity can be the non-response bias. However, when the response group is split into the 50 earliest and the 50 latest responses (Armstrong and Overton, 1977), no significant differences are found for overall perceived service quality, satisfaction and number of years as a customer. Moreover, as Krosnick (1999, p.540) quoted: "But it is not necessarily true that representativeness increases monotonically with increasing response rate… recent research has shown that surveys with very low response rates can be more accurate than surveys with much higher response rates… Therefore, having a low response rate does not necessarily mean that a survey suffers from a large amount of non response error."

DISCUSSION, LIMITATIONS AND FURTHER RESEARCH

The main purpose of this research was the development of a reliable and valid scale to measure perceived service quality in a business environment. As a second objective we wanted to determine which dimensions of perceived service quality are important in a B2B setting.

The B2B SERVQUAL scale

Several authors (Babakus and Boller, 1992, Durvasula, Lysonski and Mehta, 1999) who tried to apply the SERVQUAL scale as developed by Parasuraman, Zeithaml and Berry (1988) in a business environment were mostly unsuccessful. The B2B SERVQUAL scale as developed in this study consists of 8 dimensions. The dimensions' reliability coefficients, except one, were 0.70 or higher and thus acceptable (Nunnally and Bernstein, 1994). The lower reliability of the 'Spreading of

Risks' dimension can be explained by the limited number of items (two) loading on this factor, while Rossiter (2002) suggested three to five items to measure a particular component. The two items loading on this factor were originally part of the 'Consultative Selling' dimension and the dimension 'Spreading of risks' was thus not explicitly defined by Westbrook and Peterson (1998). Therefore, only two items (item 19 and 20) concerning risk spreading were part of the original 46 item-scale. The other analyses concerning the validity of the B2B SERVQUAL scale imply that the risk spreading dimension is a valid dimension and has a significant impact on the perceived service quality in a business environment, despite the limited number of items measuring this dimension. An enhanced assessment of this service quality dimension might increase the overall fit of the B2B SERVQUAL model. Further research around the impact of risk bearing by the service provider on the perceived service quality and on the industrial relationship is needed.

The used measures for convergent and discriminant validity (Bagozzi, 1981) reveal no serious problems for the B2B SERVQUAL scale. The same method has been applied by Babakus and Boller (1992) for assessing the B2C SERVQUAL scale in a business setting. Their data indicate that for all items, except one, the lowest within-dimension correlation is lower than the highest cross-dimension correlation. Thus, 21 of the 22 items had a problematic discrimination in measurement as defined by Bagozzi (1981). When we calculated for each item the average within-dimension correlation and the average cross-dimension correlation per dimension, many of the discrimination in measurement problems remained. The B2B SERVQUAL scale applied in this research had high average within-dimension correlations and lower average cross-dimension correlations. Therefore, we can state that the B2B SERVQUAL scale shows a better discriminant validity than the B2C SERVQUAL scale when applied in a business setting.

Some authors have used another definition of validity to test the SERVQUAL scale. Durvasula, Lysonski and Mehta (1999) defined discriminant validity as relatively small correlations among the different dimensions of perceived service quality. The correlations among the B2B SERVQUAL dimensions as illustrated in table 8 are considered acceptable. The correlation between the reliability, responsiveness and access dimension (Dim1) and the credibility dimension (Dim7) is relatively strong (above 0.60) and may indicate some degree of multicollinearity. However, in comparison with the correlations among the B2C SERVQUAL dimensions in a business context, as computed by Durvasula, Lysonski and Mehta (1999), the B2B SERVQUAL correlations are lower, and thus more acceptable. Except for the tangibles dimension, all correlations in the Durvasula, Lysonski and Mehta study (1999) are above 0.90. Moreover, in our study, the confidence intervals around those correlations did not contain a value of 1, while this was the case in the Durvasula, Lysonski and Mehta study (1999). These are another indication that the B2B SERVQUAL scale may give better validity results than the B2C SERVQUAL scale when applied in a B2B environment. However, one problem

emerges from the correlations in table 8. The market clout and geographical presence dimension (Dim2) has no significant correlation with some of the other dimensions (Dim1, Dim4, Dim5, Dim7).

INSERT TABLE 8 ABOUT HERE

The criticism of the B2C SERVQUAL in a consumer setting deals with the disconfirmation paradigm and the dimensionality of the scale. Opposed to the unclear item-factor loadings in some of the B2C SERVQUAL applications (Carman, 1990), the resulting factor pattern obtained after oblique rotation was very clear and made an easy interpretation possible. Further research has to investigate whether these stable item-factor loadings are maintained in other B2B SERVQUAL applications. Some of the dimensions of the B2B SERVQUAL scale have a relatively high correlation. This can indicate a great overlap among these dimensions and pose a threat to the dimensionality of the B2B SERVQUAL scale. More research is required to confirm the eight-dimensionality of perceived service quality and their possibly generic character across business settings.

Despite the decision of not measuring expectations in this research to avoid the disconfirmation paradigm discussion (Carman, 1990, Brown, Churchill and Peter, 1993), the measurement of expectations might give managers a more complete assessment of service quality and a better insight into quality improvement opportunities (Parasuraman, Zeithaml and Berry, 1993). For business managers, it is important to know in which service areas expectations are highest, whether expectations differ between groups of customers and if expectations change over time and are influenced by independent variables as brand name (Pitt, Morris and Oosthuizen, 1996).

We remark that the B2B SERVQUAL questionnaire was completed by managers who were responsible for the facility services purchased from an external supplier. However, the perception of the supplier's service quality may be different across diverse organizational hierarchies (Moore, Schlegelmilch, 1994), partly because their experience with the service provider differs (Durvasula, Lysonski and Mehta, 1999) and the importance attached to the service quality dimensions varies (Qualls, Rosa, 1995). Qualls and Rosa (1995) suggested that multiple decision participants from the same buying organisation should be questioned to get a more accurate view of the company's perception of the supplier's performance. More research dealing with who should be involved in the measurement of service quality in a B2B environment is required.

This study resulted in a first draft of an instrument to measure perceived service quality in a B2B environment. The assessment of the scale is based on data collected in the facility services sector. Further research is needed to assure the scales external validity in this business setting. Moreover, as in the consumer sector (Cronin and Taylor, 1992, Brown, Churchill and Peter, 1993), the service

quality dimensions may not be universally applicable across different types of business services (Bienstock, Mentzer and Bird, 1997). Therefore, the B2B SERVQUAL scale also needs to be assessed in other B2B service settings as well, like insurance, consultancy or the IT sector.

Dimensions of perceived service quality in industrial settings

Although some of the dimensions as defined by Westbrook and Peterson (1998) remain the same after the factor analysis, other dimensions have disappeared or have other loading items.

The 'Consultative Selling' dimension encompasses supplier's advice for the customer, understanding the customer and the willingness to set up a partnership, but in the facility services sector these aspects seem less relevant than the bearing of risk by the service supplier. One explanation is the outsourcing phenomenon: the facility services in our study are purchased from an external service provider (outsourcing) and the customer wants the supplier to bear all responsibility – risks included – as part of the outsourcing contract. Another explanation deals with the facility services considered as secondary services and not core services, which could explain the customer's lack of interest in the establishment of a partnership with facility services suppliers. The apparently irrelevance of the other aspects of consultative selling than the risk bearing of the supplier only holds for the facility services dealt with in this study and still needs to be retested on a larger scale in this and other business settings. Such a statement can not be generalized before profound research has confirmed this finding.

The 'market clout and geographical presence' dimension appears as a clear, distinct dimension when examining the factor loadings, the Cronbach alphas and the convergent validity. Nonetheless, the correlations between the B2B SERVQUAL dimensions reveal that the link with other dimensions is very weak or even not existing. Moreover, the dimension has no significant impact on the overall perceived service quality ratings and there is a weak relation with conceptually related variables like the renewal of the contract. Therefore, the occurrence of 'market clout and geographical presence' in the B2B SERVQUAL scale can be questioned, although Westbrook and Peterson (1998) defined it as a determinant of perceived service quality in a business setting. Before this dimension can be deleted out of the B2B SERVQUAL questionnaire, further research should examine whether this dimension is also irrelevant in other B2B service settings.

In the final factor loading pattern, the items of the originally defined competence dimension have disappeared. Apparently, the skills and knowledge of the service personnel seem not as important as their interpersonal skills and the technical support of the service provider in the facility service setting. However, we wonder whether competence of service personnel still remains less relevant in a

B2B service environment like IT or consultancy where the customer may display a higher involvement with the service delivered. We also note that the technical support of the service provider seems more important than other tangible aspects like service personnel's clothing. Then again, in the facility services sector the uniform is mostly obligatory, thus service personnel's clothing is not an issue. In other services sectors, the customer may attach more importance to this aspect. Further research is necessary to gain more insight into this matter.

Another remarkable finding considers the responsiveness dimension. Only one of the five original items of responsiveness remains in the final factor loading pattern. The other items have been deleted because they did not have a high loading on one of the dimensions, but several lower loadings on more dimensions. Moreover, this item forms one dimension together with the reliability and the access items. An explanation is given by Parasuraman, Zeithaml and Berry themselves. In 1991 they noted that the responsiveness items had sizeable crossloadings on other dimensions, particularly reliability and assurance (Parasuraman, Zeithaml and Berry, 1991). In 1994 they found considerable interdimensional overlap, especially among responsiveness, assurance and empathy (Parasuraman, Zeithaml and Berry, 1994a) – with empathy encompassing the original access dimension (Parasuraman, Zeithaml and Berry, 1988). Is this an indication that responsiveness is encompassed by the other SERVQUAL dimensions and can therefore be deleted from the scale? A second explanation refers to the business research setting of this study. Is, in the eyes of the business manager, responsiveness – defined as delivering a prompt, on-time service – a part of the reliability and accessibility of the service provider? Should an available service provider who delivers a consistent service also deliver a prompt, on-time service to be perceived as a high-quality service provider? Future research could answer these questions.

Not only should the dimensions of perceived service quality be applied across businesses with caution (cf. supra), the importance of the dimensions may also vary across service sectors. In our research, the reliability, responsiveness and empathy dimension has the highest impact on overall perceived service quality (adjusted R^2 of 0.53) (cf. table 7). In the consumer services, reliability is also generally considered as the most important service quality dimension, but for some services other dimensions are vital (Powpaka, 1996). Similarly in the B2B environment, dimensions like credibility or interpersonal skills might be more important in other business service sectors. Moreover, the importance attached to a dimension can not only differ among the sector of the service provider, it might also differ among the sector of the customer (Westbrook and Peterson, 1998) or even vary across organization functions (Qualls, Rosa, 1995) (cf. supra).

Some of the dimensions which are important in a business setting are not included in the B2C SERVQUAL scale as defined by Parasuraman, Zeithaml and Berry (1988). Price and product offering,

but even market clout and geographical presence, may play a role in the perception of service quality in a consumer environment. Carman (1990) already noted that price sometimes enters into quality considerations in a B2C context.

Other dimensions of perceived service quality can be overlooked in the B2B SERVQUAL scale as well, although most dimensions of the consumer setting are covered. Empirically, we also note that some dimensions might be missing since the multiple regression of all dimensions on perceived service quality has an adjusted R^2 of 0.61. As suggested by some researchers, technological leadership (Qualls and Rosa, 1995) or innovativeness (Kong and Mayo, 1993) can play a role in the perception of quality in a business environment. White and Galbraith (2000) noted that the service provider's commitment and flexibility played an important role in the service quality perception of the health service provider's business customers. Further research is needed to examine whether the overall fit of the B2B SERVQUAL scale is improved when new service quality dimensions are added.

Finally, we stress that the occurrence of a dimension or the absence of another dimension in the measurement instrument for perceived service quality in a business setting can be caused by the setting in which the scale has been assessed. Therefore, more research concerning the measurement of perceived service quality in other B2B environments is of vital importance to this environment. Not only will managers have a more complete view of the determinants of perceived service quality, they will also be able to assess more truly the service quality they deliver to their customers and as such intensify the relationship between both companies.

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Table 1: Comparison of service quality dimensions in a consumer or industrial setting

Dimension	**PZB**	**WP**	**Definition**
Reliability	X	X	Consistency of performance and dependability
Responsiveness	X	X	Willingness and readiness to provide service
Competence	X	X	Possession of required skills and knowledge to perform the service
Access	X	X	Approachability and ease of contact
Credibility	X	X	Trustworthiness, believability, honest
Courtesy	X		Politeness, respect consideration and friendliness of contact personnel
Communication	X		Keeping customers informed in a language they can understand and listening to them
Interpersonal skills		X	Provider's willingness to openly communicate, to show respect and courtesy
Security	X		Freedom from danger, risk or doubt
Understanding the customer	X		Making the effort to understand the customer's needs
Consultative Selling		X	Provider's ability to embed within the client's operations
Tangibles	X		The physical evidence of the service
		X	Provisions for offering automation for access and information
Price		X	The monetary allocation in return for service
Product offering		X	The scope (amount) of services available to the clients
Market clout		X	Provider's ability to secure the best service offerings at the lowest prices (market power)
Geographical presence		X	Being able to offer other services in other distal markets

Based on Parasuraman, Zeithaml and Berry (1985) (PZB) and Westbrook and Peterson (1998) (WP)

Table 2: Factor Loadings Following Oblique Rotation

Item	Dim1	Dim2	Dim3	Dim4	Dim5	Dim6	Dim7	Dim8
29	**.84**							
9	**.81**							
30	**.77**							
8	**.71**							
4	**.71**							
10	**.57**							
41		**.89**						
43		**.86**						
40		**.83**						
46		**.75**						
42		**.68**						
44	.27	**.61**						
46		**.55**						
23			**.91**					
22			**.85**					
24			**.60**					
20				**.87**				
19				**.71**				
26					**.94**			
27					**.87**			
25					**.86**			
38						**.89**		
37						**.86**		
35							**.85**	
34							**.80**	
32	.29						**.68**	
33	.25						**.67**	
13								**.88**
31								**.74**

Loadings lower than .25 are not shown.

Table 3: Confirmatory Factor Analysis with LISREL

Statistics	Value
Chi- square (χ^2)	617.8233 (p=0.0)
Degrees of freedom (df)	349
χ^2/df	1.7703
Goodness-of-Fit Index	0.7938
Adjusted Goodness-of-Fit Index	0.7430
Root Mean Square Error of Approximation	0.0685
Normed Fit Index	0.9036
Comparative Fit Index	0.9515
Tucker-Lewis index	0.9436

Table 4: Reliability Coefficients of B2B SERVQUAL dimensions

Dimension	Label	Number of items	Reliability Coefficient
Reliability, Responsiveness and Access	Dim1	6	.90
Market Clout and Geographical Presence	Dim2	7	.87
Price	Dim3	3	.83
Spreading of Risks	Dim4	2	.62
Interpersonal skills	Dim5	3	.91
Product Offering	Dim6	2	.80
Credibility	Dim7	4	.87
Technical support by service provider	Dim8	2	.70

Table 5: Correlation Matrix of the B2B SERVQUAL Items

Dim	Item	1 4	1 8	1 9	1 10	1 29	1 30	8 13	8 31	4 19	4 20	3 22	3 23	3 24	5 25	5 26	5 27	7 32	7 33	7 34	7 35	6 37	6 38	2 40	2 41	2 42	2 43	2 44	2 45	2 46
1	4	**1.00**																												
1	8	**.66****	**1.00**																											
1	9	**.75****	**.80****	**1.00**																										
1	10	**.50****	**.64****	**.61****	**1.00**																									
1	29	**.54****	**.65****	**.62****	**.50****	**1.00**																								
1	30	**.48****	**.61****	**.60****	**.45****	**.82****	**1.00**																							
8	13	.03	.21**	.14	.21**	.14*	.17*	**1.00**																						
8	31	.25**	.48**	.40**	.39**	.38**	.40**	**.57****	**1.00**																					
4	19	.19**	.33**	.24**	.36**	.24**	.17*	.25**	.26**	**1.00**																				
4	20	.09	.26**	.13	.18*	.19**	.09	.12	.12	**.45****	**1.00**																			
3	22	.31**	.36**	.31**	.31**	.23**	.28**	.14	.19**	.14*	.21**	**1.00**																		
3	23	.29**	.29**	.27**	.22**	.18*	.23**	.13	.22**	.15*	.13	**.70****	**1.00**																	
3	24	.49**	.62**	.53**	.45**	.42**	.39**	.23**	.37**	.25**	.22**	**.53****	**.64****	**1.00**																
5	25	.44**	.51**	.41**	.37**	.42**	.35**	.10	.36**	.28**	.09	.20**	.24**	.44**	**1.00**															
5	26	.51**	.50**	.43**	.39**	.38**	.34**	.14	.35**	.26**	.10	.24**	.27**	.47**	**.79****	**1.00**														
5	27	.42**	.47**	.42**	.38**	.42**	.41**	.06	.33**	.29**	.05	.26**	.30**	.42**	**.70****	**.82****	**1.00**														
7	32	.53**	.55**	.53**	.50**	.40**	.45**	.09	.34**	.22**	.10	.31**	.38**	.56**	.39**	.41**	.45**	**1.00**													
7	33	.51**	.58**	.53**	.49**	.46**	.46**	.08	.29**	.25**	.16*	.37**	.35**	.58**	.39**	.44**	.43**	**.72****	**1.00**												
7	34	.45**	.47**	.40**	.41**	.33**	.33**	.07	.33**	.25**	.14*	.35**	.35**	.55**	.42**	.49**	.47**	**.65****	**.74****	**1.00**											
7	35	.31**	.34**	.30**	.31**	.30**	.36**	.06	.33**	.21**	.01	.26**	.27**	.34**	.31**	.36**	.38**	**.56****	**.53****	**.61****	**1.00**										
6	37	.27**	.37**	.33**	.30**	.31**	.29**	.08	.28**	.24**	.09	.20**	.32**	.30**	.25**	.27**	.31**	.26**	.32**	.17*	.26**	**1.00**									
6	38	.10	.17*	.19**	.12	.19**	.15*	.09	.21**	.15*	.04	.14*	.21**	.20**	.05	.05	.16*	.16*	.15*	.09	.17*	**.67****	**1.00**							
2	40	.01	.02	.03	.04	.07	.05	.19*	.21**	.02	.11	.10	.13	.16*	.03	.02	.06	.04	.15*	.07	.04	.21**	.36**	**1.00**						
2	41	.04	.02	.06	.04	.04	.03	.15*	.15*	.02	.05	.07	.13	.12	.01	.05	.09	.08	.19**	.06	.03	.23**	.32**	**.76****	**1.00**					
2	42	.10	.15*	.16*	.18*	.18*	.13	.27**	.13	.04	.04	.14	.11	.18*	.08	.06	.03	.15*	.23**	.06	.04	.30**	.31**	**.53****	**.59****	**1.00**				
2	43	.01	.03	.05	.11	.08	.03	.18*	.18*	.00	.06	.09	.13	.18*	.04	.03	.09	.18*	.23**	.15*	.06	.18*	.30**	**.74****	**.76****	**.60****	**1.00**			
2	44	.10	.09	.14	.10	.17*	.18*	.02	.03	.02	.09	.12	.15*	.16*	.06	.04	.00	.14*	.18*	.00	.03	.21**	.29**	**.34****	**.44****	**.48****	**.49****	**1.00**		
2	45	.09	.15*	.18*	.20**	.05	.08	.13	.09	.05	.02	.24**	.19**	.17*	.01	.08	.09	.14	.22**	.10	.11	.27**	.30**	**.39****	**.54****	**.45****	**.39****	**.50****	**1.00**	
2	46	.04	.09	.01	.07	.01	.01	.09	.02	.08	.11	.04	.14	.06	.12	.09	.09	.02	.09	.06	.07	.12	.12	**.50****	**.58****	**.43****	**.49****	**.51****	**.47****	**1.00**
CV		.58	.67	.68	.54	.62	.59	.57	.57	.45	.45	.62	.67	.59	.75	.81	.76	.65	.66	.66	.57	.67	.67	.54	.61	.51	.58	.46	.46	.50
DV		.24	.31	.27	.27	.24	.23	.13	.26	.18	.11	.22	.22	.34	.24	.26	.26	.30	.33	.26	.21	.25	.18	.10	.09	.14	.11	.11	.13	.07

* significant at 0.05
** significant at 0.01

Table 6: Significant differences in mean values of the dimensions according to the overall service quality categories

	Overall Service Quality							
	Poor		Neutral		Rather Good		Good		Very Good
Dimension									
Dim1	3.52	//	4.46	~	4.78	//	5.77	//	6.17
Dim2	4.70	~	4.80	~	4.72	~	4.90	~	5.39
Dim3	4.20	~	4.68	~	5.01	//	5.61	~	5.83
Dim4	3.47	~	3.05	//	4.04	~	4.43	~	4.97
Dim5	4.33	~	4.82	~	5.25	//	5.85	~	6.35
Dim6	4.67	~	4.93	~	4.74	//	5.47	~	6.06
Dim7	4.90	~	5.51	~	6,00	//	6.40	//	6.86
Dim8	4.23	~	3.85	~	4.26	//	5.17	~	5.00

~ means not significantly different at 0.05 level
// means significantly different at 0.05 level

Table 7: Impact of B2B SERVQUAL dimensions on perceived service quality

Dimension	Sign.	Adjusted R^2	Standerdized Coefficient
Dim1	0.000	0.53	0.729
Dim2	0.150	0.01	0.103
Dim3	0.000	0.22	0.474
Dim4	0.000	0.11	0.340
Dim5	0.000	0.36	0.606
Dim6	0.000	0.09	0.312
Dim7	0.000	0.35	0.598
Dim8	0.000	0.08	0.285

Table 8: Correlations between the B2B SERVQUAL dimensions

	Dim1	Dim2	Dim3	Dim4	Dim5	Dim6	Dim7	Dim8
Dim1	1.00							
Dim2	.08	1.00						
Dim3	.50**	.18*	1.00					
Dim4	.30**	.03	.25**	1.00				
Dim5	.56**	.00	.41**	.23**	1.00			
Dim6	.31**	.34**	.29**	.16*	.22**	1.00		
Dim7	.61**	.12	.53**	.23**	.52**	.25**	1.00	
Dim8	.35**	.16*	.26**	.26**	.26**	.19**	.25**	1.00

* significant at 0.05 level
** significant at 0.01 level

APPENDIX 1: Items initially used in the B2B SERVQUAL scale[8] [9] [10]

Responsiveness

1. *The service provider tells the customer exactly when certain services will be provided*
2. *The customer is promptly served by the service provider's personnel*
3. *The service provider is on time to scheduled meetings*
4. The service provider meets deadlines for projects and assignments
5. *The service provider can be proactive to unperceived problems with service delivery*

Reliability

6. *The service provider is consistently performing the service correctly*
7. *"Doing it right the first time" applies to the service provider*
8. Projects and assignments are properly followed-through by the service provider
9. When the service provider promises to do something by a certain time, he does so
10. The service provider keeps his paperwork accurately

Tangibles

11. *The service provider has an up-to-date equipment*
12. *The service provider's employees are well dressed and appear neat*
13. The service provider provides on-line computer services or idiosyncratic investments

Competence

14. *The service provider's employees do not possess the required skills and knowledge to properly perform the needed service (-)*
15. *The service provider does not have sufficient expertise in the area of the provided service (-)*
16. *The service provider does not possess good problem-solving skills (-)*

Consultative selling

17. *The service provider understands and knows the client's business*
18. *The service provider offers advice to include programs or training and education*
19. Certain duties and responsibilities for the client are absorbed by the service provider
20. The service provider incurs risk for the client
21. *The service provider wants to establish partnerships with goal setting*

Price

22. The price of the service provider meets the client's budget objectives
23. The price is competitive compared to other offers for similar services
24. The price of the service provider relates to the quality delivered

Interpersonal skills

25. The personnel of the service provider is sociable and friendly
26. The service provider's personnel is polite and respects the privacy of others
27. The service provider's personnel can be trusted
28. *The service provider communicates openly with the customers*

Accessibility

29. The service provider is available at all times to assist the client
30. The service provider can be easily contacted
31. The service provider has technical resources that ease access and information spreading

[8] Based on the determinants of service quality in a B2B setting of Westbrook and Peterson (1998)
[9] The items in italic were deleted during the factor analysis
[10] (-) are negatively worded items

Credibility

32. The service provider is not believable and honest (-)
33. The personnel and the service provider do not have a good reputation in the market (-)
34. The company of the service provider does not demonstrate ethical conduct (-)
35. Confidential and proprietary information of the customer is not protected by the service provider (-)

Product offering

36. The service provided is customized and unique
37. The customer has multiple options and programs to choose from and compose the service
38. The service provider offers an extended scope of services available (in one kind of service)
39. The service provider is an "one-stop-shop" vendor (several kinds of services)

Market clout (market power)

40. The service provider has leverage (power and influence) in the market
41. The service provider has a large presence (market share) in the market
42. The service provider has the ability to coordinate and consolidate resources with other companies
43. The service provider acts as a leader to other companies in the market

Geographical presence

44. The service provider is able to offer his services in other distal markets
45. The service provider is able to offer his services in other cities nationally
46. The service provider is able to offer his services in other countries

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