Moments of sorrow and joy
An empirical assessment of the complementary value of critical incidents in understanding customer service evaluations

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Abstract *It is commonly acknowledged that service quality can be measured by using attribute-based and incident-based measurements. Both methods are distinct in nature, but can be used complementarily. However, in the literature a simultaneous empirical investigation of the power of critical incidents in relation to attribute scores is lacking. In this paper we merge both methods for assessing service quality in a professional services context. Subsequently, both measurements have been used to investigate the effect of service quality on short-term customer satisfaction and long-term trust in the service provider. Results indicate that the combined approach adds value to single-method measurement for explaining customer satisfaction. Furthermore, negative incidents are more influential on satisfaction than positive experiences. However, the negative effect of a negative incident on satisfaction can be compensated for by paying attention to particular dimensions of service quality. Critical incidents do not seem to have an impact on the apparently stable construct of trust.*

Introduction

In the services marketing literature the importance of service encounters between service providers and their customers is commonly acknowledged. The expression "moment of truth" underlines the crucial role each service encounter plays in customer evaluations of the service. From this perspective the encounter-specific evaluations provide valuable information to the provider. A customer's level of satisfaction with the service provider, based on a single observation or transaction, is useful in assessing such encounter-specific evaluations of service quality (Oliver, 1997). However, in the light of the current interest in relationship marketing it can be argued that all individual service encounters add up to service relationships. Therefore, in addition to the performance-related evaluation of satisfaction, it is interesting to identify a more relationship-driven measure. In this paper customer trust in the service provider will be regarded as a suitable construct to determine a relationship-oriented evaluation of service quality.

With respect to the measurement of service quality, a distinction can be made between attribute-based and incident-based measurements. Attribute-based measurements provide an evaluation of the general level of service quality. However, as it was stated that moments of truth are extremely influential in service evaluations, it can be imagined that some moments are more equal than others: moments of both sorrow and joy. Therefore, the critical

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incident technique might provide an additional tool to assess the evaluation of specific service experiences. It is recognised that attributes and incidents can be applied as complementary measures of service quality, but in the literature a simultaneous empirical investigation of the power of critical incidents in relation to attribute scores has not been offered yet. Following and extending Stauss and Hentschel's work (1992) we attempt to merge attribute-based scores and critical incidents in order to get a profound and more comprehensive understanding of service quality in an industrial services context.

This paper is structured as follows. First, an overview is provided of attribute-based versus incident-based measurement of service quality. Subsequently, a brief discussion of satisfaction and trust as consequences of service quality will be given, followed by an explanation and visualisation of our conceptual model. After this theoretical part we will report on the results of an empirical study in a professional services setting. We conclude the paper with a discussion of our results and provide a number of theoretical and managerial implications.

Attribute-based versus incident-based service quality
With respect to quality in the services industry the literature distinguishes between two types of service quality: general attribute-based and incident-based service quality (Bitner *et al.*, 1990; Parasuraman *et al.*, 1988; Stauss and Hentschel, 1992). Until now, most research has focused on one type of service quality assessment in isolation. Attribute-based measurement refers to the general level of quality that customers consider when evaluating a service activity. In doing so, customers evaluate more than just the general result of the service that they experience. They also take into account the process through which the service is provided and various other aspects, also referred to as attributes or dimensions, of the service (Oliver, 1997). Parasuraman *et al.* (1988) differentiate between five general dimensions of service quality in consumer markets: reliability, responsiveness, assurance, empathy and tangibles. The overall evaluation of these five service dimensions results in a general (i.e. aggregated) quality judgement for the service as a whole. The most commonly used tool for measuring attribute-based service quality is the SERVQUAL instrument developed by Parasuraman *et al.* (1988; 1991), which incorporates each of the five dimensions and measures customers' general attitudes towards these dimensions.

Although the SERVQUAL dimensions have been applied extensively in a consumer service setting, their applicability in the industrial service setting is limited. The main reason for this is that industrial settings often require emphasis on more specific elements of the service delivery process, because of the highly specialised nature of the industrial environment. As Edvardsson (1997, p. 491) states "to be able to study quality in service companies, one must first be aware of the characteristic features of services and service production". This requires adaptations in the approach and determination of service quality in different types of service industries. General service dimensions like the SERVQUAL dimensions neglect specific aspects that constitute service quality

more appropriately in an industrial market. A more elaborate discussion of our adaptations to the industrial service setting will be provided in the section on "questionnaire development".

In contrast to general attribute-based service quality, customers can also evaluate services on the basis of specific incidents, also referred to as critical incidents, that they have experienced with a certain service provider. In essence attribute-based and incident-based measurements focus on separate issues. Attribute-based measurement is directed at assessing attitudes towards service quality dimensions, whereas incident-based measurement identifies specific events and behaviours that occur during interaction between human beings in service encounters (Bitner *et al.*, 1990). However, along two points of view, service quality can be assessed on the basis of critical incidents. First, "the customer's perception of these encounters is a crucial component in the evaluation of the quality of the service" (Edvardsson, 1997, p. 492). Subsequently, the incidents can be related to customer satisfaction and dissatisfaction (Bitner *et al.*, 1990), to assess how incident-based service quality influences these concepts. Second, on the basis of content analysis critical incidents can be classified into categories of, for example, service employee behaviours (e.g. see Bitner *et al.,* 1990), which in essence means identifying important service attributes. The only difference with attribute-based measurement by using SERVQUAL dimensions is that classification of critical incidents allows for identification of customer-defined service attributes, allowing more freedom in measuring service quality and preventing researchers' "blind spots". Attribute-based measurement on the basis of SERVQUAL dimensions presumes some customer experience of the service and it can be argued that this experience may include critical incidents and that SERVQUAL already allows for critical incidents. However, it is important to keep in mind that SERVQUAL measurements do not take specific events and behaviours into account, which have an influence on customer evaluations of service quality. Both attribute-based and incident-based measurements can be used to assess service quality. However, the underlying factors constituting service quality are quite different for both types of measurements.

Critical incidents can be studied by applying the Critical Incident Technique (CIT), a method that was developed by Flanagan (1954) in psychology for collecting, and classifying stories or critical incidents by employing content analysis. According to Flanagan (1954, p. 327) an incident is "any observable human activity that is sufficiently complete in itself to permit inferences and predictions to be made about the person performing the act". A critical incident "makes a 'significant' contribution, either positively or negatively, to the general aim of the activity" (Flanagan, 1954, p. 338). The CIT has proven to be useful in a variety of research fields (Bitner *et al.,* 1990; Duffy, 1983). In the context of services, Bitner *et al.* (1990, p. 73) define critical incidents as "specific interactions between customers and service firm employees that are especially satisfying or especially dissatisfying". Taking critical incidents into account has several advantages, which mainly relate to their enduring impact. First, critical incidents are top of mind even in the long run. From this perspective it is useful to incorporate them in a relationship-oriented assessment of service

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quality. An additional advantage is that critical incidents provide concrete areas for improvement from a customer point of view. The provider does not need to define dimensions or attributes to be evaluated, but the customer provides self-declared areas of service quality. Finally, when improvements in the service delivery process are made on the basis of reported critical incidents, this may lead to changes in patronage behaviour, meaning that customers might become more loyal to the service organisation.

The distinction between general attribute-based and incident-based service quality can be clarified comprehensively by considering a continuous line (see Figure 1).

On the left side negative critical incidents, leading to great dissatisfaction, are depicted. On the right side positive critical incidents can be visualised. These critical incidents result in high levels of customer satisfaction. The impact of negative incidents is likely to be more substantial than that of positive incidents. This is based on the notion that positive experiences with a service provider are considered to be some sort of minimum requirement a provider has to fulfil (Fisk and Young, 1985). In the middle of Figure 1 there is the so-called "zone of tolerance", which indicates the area between acceptable and desired service (Zeithaml and Bitner, 1996). This zone represents the level to which consumers accept variability in the performance of a service provider and refers to service quality on a general level, easily operationalised by various attributes of a service. Our assumption is that in case of a negative critical incident the acceptable level of service quality is not reached, whereas a positive critical incident implies that the desired level is exceeded. This idea is visualised by the extreme ends in Figure 1. With respect to the effects of critical incidents it is likely that the "zone of tolerance" will function as a buffer zone, meaning that the ultimate effect of critical incidents that customers experience will be determined by how customers perceive the service quality in terms of the more general attributes.

Although attribute-based measurement of service quality differs substantially from incident-based assessment of service quality with regard to the used methodology and perspective, advantages can be achieved by using both approaches complementarily (Stauss and Hentschel, 1992). The call for integration of both methods has not been answered substantially so far. For routine service situations that fall within the customer's zone of tolerance, customer reports on general attribute-based service quality may suffice. However, since in the services industry often unexpected, non-routine situations take place, standardised and attribute-based methods may be incomplete and do not take the
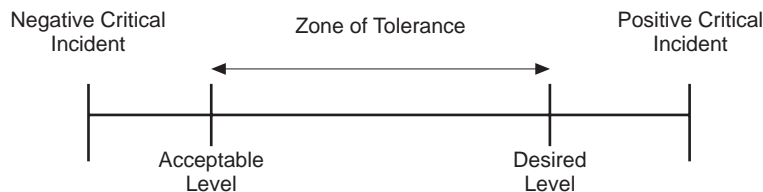
Figure 1.
The service quality
continuum

Source: based on Zeithaml and Bitner, 1996

idiosyncrasies of the customer-seller relationship into account. Therefore, for these situations, additional story-based research methodologies directed at critical incidents, such as the CIT, may be needed to provide the complete picture. After having discussed two potentially complementary techniques in assessing service quality, we will focus in the next paragraph on two important consequences of service quality, namely satisfaction with and trust in the service provider.

Satisfaction and trust as consequences of service quality
There is scientific consensus about the crucial role that trust plays in establishing and maintaining long-term relationships between industrial partners (Morgan and Hunt, 1994). A relationship between two partners can only continue to exist if a certain level of trust has developed between both parties, as can be concluded from previous research (e.g. Wetzels *et al.*, 1998). Satisfaction can be considered to be an important criterion, which has to be fulfilled for building trust between partners and increasing the intention to continue the relationship. Before we can elaborate on the added value of a combined approach for measuring service quality and its impact on satisfaction and trust, it is necessary to pay attention to the link between service quality and satisfaction. Satisfaction can be described as a customer's cognitive and affective evaluation of a product or service, which is being delivered to him/her by a specific provider (Oliver, 1997). The issue of the sequential order of quality and satisfaction in services has caused considerable debate in the literature (de Ruyter *et al.,* 1997). In order to determine the sequence of these two constructs, it is useful to focus on their differences and similarities first. Oliver (1997) discusses differences between quality and satisfaction, which are based on six fundamental levels:

(1) whether experience with the service is required;
(2) which dimensions consumers use to form judgements;
(3) the nature of the standards used;
(4) the degree of cognitive and affective content;
(5) the existence of other conceptual antecedents;
(6) the primary temporal focus.

According to Oliver (1997) these levels can be used to make a clear distinction between quality and satisfaction. The differences between both concepts are summarised in Table I.

It can be concluded from this Table "that satisfaction is an immediate response to consumption, while quality exists prior to and subsequent to consumption as an enduring signal of product or service excellence" (Oliver, 1997, p. 188). Despite the clear differences between quality and satisfaction, their relationship remains complex. In our study we assume that quality is an antecedent of satisfaction since it can be expected that after an objective comparison between expectations and perceptions, resulting in a quality evaluation, this comparison is subjectively interpreted by customers which leads to satisfaction or dissatisfaction (de Ruyter *et al.*, 1997).

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Table I.
Conceptual differences
between quality and
satisfaction

Comparison dimension	Quality	Satisfaction
Experience dependence	None required	Required
Dimensions	Specific to characteristics defining service quality	Potentially all service dimensions
Standard	Ideals, excellence	Predictions, norms, needs
Cognitive/affective	Primarily cognitive	Cognitive and affective
Conceptual antecedents	External cues (e.g. price, reputation)	Conceptual determinants (e.g. affect, dissonance)
Temporal focus	Primarily long-term	Primarily short-term

Source: adapted from Oliver, 1997, p. 177

Apart from this encounter-specific satisfaction there is an accelerated interest in long-term service relationships (Storbacka *et al.*, 1994). Four factors have contributed to the current focus on relationship marketing in services: the maturing of services marketing, increased recognition of potential benefits both for the firm and for the customer, and technological advances (Berry, 1995; Grönroos, 1990; Gummesson, 1997; Wray *et al.,* 1994). Today it is well understood that services are being provided on an ongoing basis and that customers form relationships with people rather than with goods. Furthermore, the objective of improving service quality is to achieve customer loyalty, which can be realised by successful relationship marketing. Liljander and Strandvik (1995) propose that perceived relationship quality is a core concept when analysing service quality from a dynamic perspective. Service providers benefit from customer relationships (Gwinner *et al.,* 1998), because loyal customers generate more revenue (Reichheld and Sasser, 1990) and the costs of maintaining current customers are lower than the costs of acquiring new ones (Berry, 1995). Other relationship benefits to the firm are decreased price competition and unwillingness of the customer to switch suppliers due to their investment in the relationship (Szmigin, 1993). Customers enter into marketing relationships because they expect to receive relationship utility from their participation (Ganesan, 1994). Equity theory postulates that parties in exchange relationships compare their ratios of exchange inputs to outcomes. Inequity is said to exist when the perceived inputs and/or outcomes in an exchange relationship are psychologically inconsistent with the perceived inputs and/or outcomes of the referent (Houston and Gassenheimer, 1987; Huppertz *et al.*, 1978; Oliver and Swan, 1989). Finally, rapid advances in information technology are decreasing the costs and increasing the practicality of relationship marketing in services, while its potential benefits are becoming better known (Bejou, 1997; Berry, 1995).

Since the focus in the service industry moves towards enduring relationships with customers it is apparently more appropriate to assess service quality also by a long-term measure rather than by short-term-oriented satisfaction only. Many services are difficult to evaluate prior to purchasing and experiencing them and

even after they have been provided to customers (Berry, 1995). This refers to the so-called "credence qualities" of services (Zeithaml and Bitner, 1996). This credence component emphasises the need for trust in service relationships. Transaction cost theory suggests that customers become involved in enduring relationships in order to reduce transaction costs. Transaction cost theory departs from the assumptions that individuals are limited in their cognitive capabilities and that they are inclined towards opportunistic and self-interest-seeking behaviour. As a result, in situations when information is unequally spread across exchange parties, opportunistic behaviour is believed to prevail and exchange may be commercially hazardous (Andaleeb, 1995; Krapfel *et al.*, 1991; Stern and Reve, 1980). Consequently, exchange partners must trust one another to behave fairly when unforeseen events arise (Bendapudi and Berry, 1997). Trust can be defined as "one party's belief that its needs will be fulfilled in the future by actions undertaken by the other party" (Anderson and Weitz, 1989, p. 312). Other definitions of trust are "a willingness to rely on an exchange partner in whom one has confidence" (Moorman *et al.*, 1992, p. 315) and "confidence in an exchange partner's reliability and integrity" (Morgan and Hunt, 1994, p. 23). All definitions implicitly focus on the long-term character of trust as opposed to, for instance, satisfaction, which has a more short-term temporal focus. In the current study trust is considered to be a long-term consequence of service quality.

Following the ideas presented in the preceding sections we develop the research propositions that:

- by taking positive and negative critical incidents into account more variance in customer judgements in terms of satisfaction and trust can be explained;

- positive and negative critical incidents will have different effects on satisfaction and trust;

- the effect of a critical incident on satisfaction and trust will be influenced by the level of attribute-based service quality.

The conceptual model of our study is visualised in Figure 2.

In the next section we will report on an empirical study, which was undertaken to test the aforementioned research propositions and the conceptual framework.
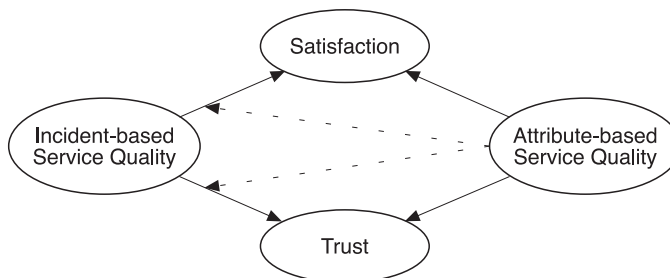

Figure 2.
Conceptual model

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An empirical study

Research setting and sampling

The focus in this study is on service evaluations by customers of a major Dutch office equipment manufacturer. This represents an interesting and rapidly developing research setting in which after-sales services are very important for companies to distinguish themselves from competitors. By applying effective after-sales service management companies can establish personal relationships with their customers, which are important in the business-to-business setting. After-sales services can be characterised by frequent personal contacts between provider and customers; this is in comparison to other industrial settings.

A mail questionnaire was designed which consisted of multiple items that operationalise the constructs that have been incorporated in our model. A total of 5,527 questionnaires were mailed to customers of the manufacturer. Personalised cover letters and a stamped return envelope accompanied the questionnaires. In total 1,844 usable questionnaires were returned, which represents a response rate of 33.4 percent. This response rate is considered to be satisfactory, given the fact that the average response rate of mail questionnaires in marketing related studies usually lies between 10 and 30 percent (Green *et al.*, 1988), but may be as low as 5 percent (McDaniel and Gates, 1996). Furthermore, other studies focusing on relationships in business-to-business markets report even lower response rates (Geyskens *et al.*, 1996; Kumar *et al.*, 1995; Mohr *et al.*, 1996; Morgan and Hunt, 1994). A total number of 493 respondents reported an extremely positive or negative critical incident, which is about 27 percent of all respondents; 318 of these incidents were positive (17 percent of all respondents), 175 were negative in nature (10 percent of all respondents).

Questionnaire development

The research instrument was extensively pre-tested to minimise the length necessary to measure all constructs adequately and to modify any items that might make the survey difficult for the respondents. The pre-test indeed identified a number of items that needed to be changed for the final questionnaire. By using the logo of the university and ensuring respondents that the data would be treated with the utmost confidentiality, we attempted to reduce the chance of non-response bias to a minimum.

As was mentioned previously, the SERVQUAL dimensions as identified by Parasuraman *et al.* (1988) are of limited usability in an industrial setting. In this study, the items measuring attribute-based service quality have their origin in the underlying dimensions of the SERVQUAL instrument, but were adapted to the specific setting of the industrial office equipment market. Four main service quality dimensions were focused on, specifically compatible with the industrial setting of this particular study: employee quality, planning quality, technical quality, and internal quality. Employee quality was measured by eight items referring to aspects such as employee expertise, skills, and presentation

towards the customer. Four items were used to assess planning quality, indicated, for example, by the level to which appointments were complied with by the service provider. Technical quality was operationalised by four items, e.g. indicating the quality of equipment and supplies. Internal quality referred, for example, to the accessibility of the company by telephone and the way of delivering the equipment and was also measured by four items. All items were measured using a nine-point disconfirmation scale with which customers could directly compare their perceptions to their expectations taking the service of an excellent company as reference point (Cronin and Taylor, 1992). Overall attribute-based service quality is then operationalised by averaging the scores on the four quality dimensions.

Critical incidents were administered at the end of the questionnaire by asking respondents to formulate one extreme positive or negative experience with regard to the service provided by the office equipment manufacturer. Respondents should try to remember an instance which occurred within the last three months and about which they were extremely positive or negative. Very important is that they should describe in their own words what happened, what things were said and observed, this is in order to provide a customer initiated quality judgement. They should also mention what gave cause for this occurrence. For measuring the overall satisfaction with the manufacturer's service a single item was used. Customers were asked to grade the service of the manufacturer on a ten-point scale. Finally, trust was measured by using a multi-item scale consisting of ten items developed by Kumar *et al.* (1995). Table II presents an illustrative sample item for the four quality dimensions and trust.

Results
Before performing the actual analyses, we first had to check whether or not a non-response bias could threaten our data quality and if the internal consistency of the used measurement scales was high enough. The results of a time extrapolation test, as proposed by Armstrong and Overton (1977), revealed that

Construct	Reliability (α)	Sample item
Overall service quality	0.96	(Average of four quality dimensions)
Technical quality	0.83	Quality of supplies[a]
Planning quality	0.89	Compliance with appointments made by the planning department[a]
Employee quality	0.93	Expertise of service employee[a]
Internal quality	0.84	Accessibility of company representative by telephone[b]
Trust	0.92	Company X has always been a partner that can be trusted[b]
Satisfaction	(Single item)	(Grade of the service on ten-point scale)

Notes: [a] 1 = much worse than expected; 9 = much better than expected
[b] 1 = totally disagree; 9 = totally agree

Table II.
Construct reliabilities
and sample items

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none of the variables used in the questionnaire showed a significant difference between early and late respondents, providing evidence for absence of non-response bias. To assess the level of internal consistency we performed reliability analyses, calculating Cronbach's alpha. Table II presents the reliability scores of the various scales together with some sample items. All scores well exceed the threshold value of 0.70 proposed by Nunnally and Bernstein (1994).

To determine the effects that attribute- and incident-based service quality have on customer satisfaction with and trust in the manufacturer, we conducted stepwise multivariate regression analyses. Two separate analyses were conducted, both for satisfaction and trust: the first analysis included overall service quality, the second made a distinction between the specific dimensions of service quality, which were described previously. Each analysis was performed stepwise: in the first step only attribute-based measurements were included, in the second step the critical incidents and their interactions with the attribute-based measurements were entered into the equation. Critical incidents were operationalised by two dummy variables, one for positive and one for negative incidents. For each of the 1,844 respondents, these two dummy variables were included in the analyses, indicating whether a respondent experienced a positive, a negative, or no critical incident at all. Therefore, we base our conclusions about critical incidents on the 493 reported incidents in relation to our total sample of 1,844 respondents. The interactions between critical incidents and attribute-based service quality are calculated by the mathematical product of these variables (Anderson, 1988). This stepwise procedure enables us to evaluate the significance of the additional explained variance in both satisfaction and trust by adding critical incidents. Since we were not interested in interactions between the four dimensions of service quality we did not take these interactions into account in the analyses. The regression analysis procedure is summarised in Table III.

The regression results for satisfaction as dependent variable (quadrant ① and ② (in Table III)) are summarised in Tables IV and V. For each test a significance level of $\alpha = 0.05$ was used.

			Dependent variables			
			Satisfaction		Trust	
Independent variables	Overall service quality	Step 1:	overall quality (attribute-based)	①	Idem	③
		Step 2:	overall quality (attribute-based + critical incidents + interactions between overall quality and incidents			
	Service quality dimensions	Step 1:	four quality dimensions (attribute-based)	②	Idem	④
		Step 2:	four quality dimensions + critical incidents + interactions between four quality dimensions and incidents			

Table III.
Regression analysis procedure

	Variable	Coefficient[a]	Coefficient[b]
Step 1	1. Overall quality	0.59***	0.56***
	F-value	771.35***	
	Adj. R^2	0.31	
Step 2	1. Overall quality	0.53***	0.50***
	2. Positive incident	0.14 (ns)	0.05 (ns)
	3. Interaction (1*2)	0.00 (ns)	0.00 (ns)
	4. Negative incident	–2.41***	–0.66***
	5. Interaction (1*4)	0.35***	0.55***
	F-value	174.15***	
	Incremental F-value	16.54***	
	Adj. R^2	0.34	
	ΔR^2	0.03	

Notes: [a]unstandardised regression coefficient; [b]standardised regression coefficient; *** $p < 0.001$

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Table IV.
Results of stepwise regression analysis of overall quality and critical incidents on satisfaction (quadrant ①)

	Variable	Coefficient[a]	Coefficient[b]
Step 1	1. Employee quality	0.33***	0.34***
	2. Technical quality	0.31***	0.35***
	3. Planning quality	0.07*	0.07*
	4. Internal quality	–0.11***	–0.11***
	F-value	234.21***	
	Adj. R^2	0.36	
Step 2	1. Employee quality	0.32***	0.33***
	2. Technical quality	0.29***	0.33***
	3. Planning quality	0.02 (ns)	0.02 (ns)
	4. Internal quality	–0.10*	–0.10*
	5. Negative incident	–1.84***	–0.50***
	6. Positive incident	0.03 (ns)	0.01 (ns)
	7. Interaction (1*5)	0.05 (ns)	0.08 (ns)
	8. Interaction (1*6)	–0.12 (ns)	–0.28 (ns)
	9. Interaction (2*5)	0.09 (ns)	0.13 (ns)
	10. Interaction (2*6)	0.01 (ns)	0.03 (ns)
	11. Interaction (3*5)	0.20*	0.31*
	12. Interaction (3*6)	0.00 (ns)	0.00 (ns)
	13. Interaction (4*5)	–0.06 (ns)	–0.10 (ns)
	14. Interaction (4*6)	0.13 (ns)	0.31 (ns)
	F-value	73.32***	
	Incremental F-value	6.07***	
	Adj. R^2	0.38	
	ΔR^2	0.02	

Notes: [a]unstandardised regression coefficient; [b]standardised regression coefficient; *$p < 0.05$; *** $p < 0.001$

Table V.
Results of stepwise regression analysis of quality dimensions and critical incidents on satisfaction (quadrant ②)

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For testing whether or not critical incidents significantly increase the explained variance in customer satisfaction in comparison to only considering overall attribute-based service quality, we performed an incremental F-test (Cohen and Cohen, 1983). As can be seen in Table IV, the addition of critical incidents into the regression equation indeed increases explained variance significantly (Incremental F-value = 16.54, $p < 0.001$), resulting in an increase of the R^2 by 3 percent ($\Delta R^2 =$ 0.03). This illustrates the added value of incorporating an incident-based measurement of service quality when explaining customer satisfaction. In Table IV and subsequent Tables V, VI and VII both standardised and unstandardised regression coefficients are reported. The standardised coefficients will be used for interpretation of the relative impact an independent variable has on the dependent variable. The unstandardised coefficients can be used for visualisation of the regression equation, as will be done in Figure 3. From the final equation after step 2 it can be concluded that overall attribute-based service quality positively contributes to customer satisfaction. Positive critical incidents do not significantly impact customer satisfaction. Customers reporting negative incidents are less satisfied than customers who report no or a positive incident. However, this negative effect can be compensated for as can be concluded from the significant positive contribution of the interaction effect between overall service quality and negative incidents. This interaction effect can be clarified visually by Figure 3.

As can be seen in Figure 3 the higher the level of overall attribute-based service quality, the more the negative effect of a negative critical incident is compensated for. Therefore, the residual loss in customer satisfaction will be smaller for customers who have experienced a negative incident but evaluate the overall service quality more positively than for customers who have also been experiencing a negative incident and evaluate the overall service quality more negatively. In comparison to customers who experience no or a positive critical incident, customers who report a negative critical incident and perceive an extremely high level of overall service quality are not less satisfied. This is

	Variable	Coefficient[a]	Coefficient[b]
Step 1	1. Overall quality	0.56***	0.47***
	F-value	146.51***	
	Adj. R^2	0.22	
Step 2	1. Overall quality	0.55***	0.46***
	2. Positive incident	–0.37 (ns)	–0.10 (ns)
	3. Interaction (1*2)	0.10 (ns)	0.17 (ns)
	4. Negative incident	0.37 (ns)	0.09 (ns)
	5. Interaction (1*4)	–0.08 (ns)	–0.11 (ns)
	F-value	30.27***	
	Incremental F-value	1.16 (ns)	
	Adj. R^2	0.22	
	ΔR^2	0.01	

Table VI.
Results of stepwise regression analysis of overall quality and critical incidents on trust (quadrant ③)

Notes: [a]unstandardised regression coefficient; [b]standardised regression coefficient; *** $p < 0.001$

	Variable	Coefficient[a]	Coefficient[b]	
				Moments of sorrow and joy
Step 1	1. Employee quality	0.21**	0.20***	
	2. Technical quality	0.22***	0.22***	
	3. Planning quality	0.13*	0.13*	
	4. Internal quality	0.00 (ns)	0.00 (ns)	
	F-value	38.52***		
	Adj. R^2	0.22		**119**
Step 2	1. Employee quality	0.24**	0.23***	
	2. Technical quality	0.22***	0.22***	
	3. Planning quality	0.16*	0.16*	
	4. Internal quality	–0.08 (ns)	–0.07 (ns)	
	5. Negative incident	0.31 (ns)	0.08 (ns)	
	6. Positive incident	–0.83 (ns)	–0.22 (ns)	
	7. Interaction (1*5)	–0.20 (ns)	–0.29 (ns)	
	8. Interaction (1*6)	0.09 (ns)	0.16 (ns)	
	9. Interaction (2*5)	–0.08 (ns)	–0.11 (ns)	
	10. Interaction (2*6)	0.10 (ns)	0.15 (ns)	
	11. Interaction (3*5)	0.07 (ns)	0.10 (ns)	
	12. Interaction (3*6)	–0.38 (ns)	–0.66 (ns)	
	13. Interaction (4*5)	0.14 (ns)	0.21 (ns)	
	14. Interaction (4*6)	0.38 (ns)	0.65 (ns)	
	F-value	11.89***		**Table VII.**
	Incremental F-value	1.18 (ns)		Results of stepwise
	Adj. R^2	0.22		regression analysis of
	ΔR^2	0.02		quality dimensions and

Notes: [a]unstandardised regression coefficient; [b]standardised regression coefficient;
* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

critical incidents on
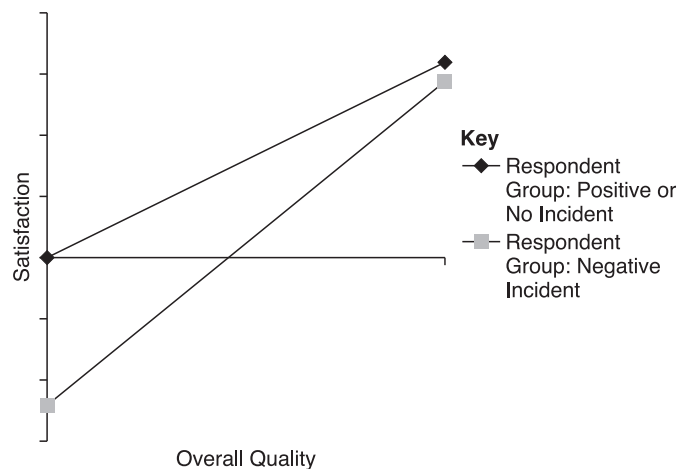trust (quadrant ④)

Figure 3.
Interaction effect

visualised in Figure 3 by the closeness of both lines for high levels of overall service quality. Since not all service quality dimensions may have the same impact, we also differentiated between the different dimensions of quality and performed an analysis analogous to the previous one. Table V renders the results of this analysis.

Again, it can be concluded from Table V that a combined attribute- and incident-based approach for measuring service quality is significantly explaining more variance in customer satisfaction than the attribute-based approach alone (Incremental F-value = 6.07, $p < 0.001$; $\Delta R^2 = 0.02$). This supports the previous finding of the relevance of taking critical incidents into consideration when explaining customer satisfaction. When differentiating between the dimensions of service quality both employee quality and technical quality significantly increase customer satisfaction. However, a higher level of internal quality negatively influences satisfaction. As before, positive incidents do not significantly affect satisfaction and negative incidents result in a decrease of satisfaction. Planning quality has no direct effect on satisfaction. However, since its interaction with negative critical incidents is significant, higher levels of planning quality will compensate for the decrease in satisfaction caused by a negative incident. The regression results for trust as dependent variable (quadrants ③ and ④ are presented in Tables VI and VII.

The change in R^2 by including the critical incidents and their interaction with overall service quality is not significant (Incremental F-value = 1.16 (ns); $\Delta R^2 = 0.01$), indicating that the level of trust customers have in the manufacturer is not significantly affected by critical incidents. Only attribute-based overall service quality significantly contributes to customer trust in the service provider. Neither positive nor negative critical incidents influence trust, either directly or indirectly through interaction effects.

From Table VII it can be concluded that also when making a distinction between the dimensions of service quality critical incidents do not explain significantly more variance in the level of trust (Incremental F-value = 1.18 (ns); $\Delta R^2 = 0.02$). Again, this is an indication of critical incidents' limited relevance for establishing trust in the service provider. The only variables increasing trust are employee quality, technical quality, and planning quality. No direct or indirect interaction effects were found for internal quality and the critical incidents.

Conclusion
Discussion
The results of this study clearly indicate that a combined approach to measuring service quality is certainly useful in explaining customer satisfaction. By extending the attribute-based measurement of service quality by additionally taking critical incidents into consideration a significantly larger amount of variance in satisfaction is explained. However, critical incidents appear to have no impact on the level of trust customers have in their service provider. Apparently, satisfaction is more related to direct performance of the

service provider and can therefore be easily influenced by critical experiences of customers, whereas trust can be considered to be a long-term relationship oriented consequence of service quality, which is not likely to be affected by one single incident.

For the establishment of customer satisfaction it is crucial to achieve a high level of overall service quality perceived by customers. This overall service quality can be established by paying thorough attention to the various industry specific attributes of service quality, such as having good employees, delivering technical quality, and establishing quality both in planning and internal procedures within the service provider's organisation. However, when service customers experience an incident, which they evaluate as extremely negative, their satisfaction will drop. This decrease in satisfaction depends on the customer's perception of the overall service quality. In other words, the negative impact that negative incidents have on satisfaction is less for customers with a more favourable attitude towards the service provider's overall quality level than for customers who express a lower level of overall service quality. This underlines the importance of overall service quality in establishing customer satisfaction, since striving for high levels of quality has both a direct and indirect effect on satisfaction. In contrast to the significant influence of negative incidents, it turned out that incidents that are evaluated as extremely positive do not strongly affect customer satisfaction, either directly or indirectly via interaction effects. Apparently, customers are inclined to think that it is a minimum requirement for service providers to render positive experiences to their customers. However, the service provider does not get any bonus-points for meeting these minimum requirements, only demerits for failing to do so, which is in line with previous research findings (Anderson and Sullivan, 1993; Fisk and Young, 1985).

In order to enable a more detailed analysis of the importance of specific dimensions of service quality a distinction was made between four process related service dimensions. It turns out that employee quality and technical quality both significantly contribute to customer satisfaction, whereas internal quality has a significantly and surprisingly negative influence on satisfaction. A possible explanation for this negative effect of internal quality could be that customers develop the impression that their direct interest is lost out of sight by the service provider when too much emphasis is placed on the internal processes, such as high accessibility of the company. No significant direct effect was found for planning quality. However, its positive interaction with negative incidents indicates that having adequate planning procedures within the organisation will serve as a back-up in case something goes wrong and a negative incident is experienced by the customer. The notion that negative incidents should be avoided as much as possible and positive incidents do not add to short-term satisfaction is also supported by this more differentiated analysis.

For developing long-term trust between a service provider and its customers, critical incidents do not seem to play a significant role. Only,

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perceived service quality on an overall level is contributing to customer trust in the service organisation. Therefore, trust can be considered a more stable consequence of service quality, contributing to a long-lasting relationship between business partners. Trust is not affected by whether or not customers experience an extreme incident, because it is more stable over time, especially in comparison to satisfaction. When customers report on a critical incident the description contains very specific and detailed information on an event that went right or wrong and on the basis of which they become either satisfied or dissatisfied. It takes more to develop or destroy trust between a service organisation and its customers than one specific event. However, satisfaction or dissatisfaction with each discrete incident serve as building blocks that will either build or inhibit trust in the long run.

When making a distinction between the dimensions of service quality it can be concluded that both the performance of the service employee and the quality of the office equipment and supplies are most important for developing trust. This is not surprising, since in a services setting and more specifically in relationship marketing, it is commonly recognised that the employee plays a crucial role in building trust. The employee is the representative of the service organisation who is directly in touch with the customer and responsible for adequate delivery of the service or finding the right solution for possible problems. The importance of technical quality stems from the high-tech character of this industrial setting. The market for office equipment is characterised by products that are subject to rapid developments in a highly technical environment (e.g. integration and digitisation of different technologies) and relatively high levels of technology-based uncertainty. This uncertainty is related to the high financial costs that are intertwined with the rapid advances in technology (e.g. systems integration, automated remote sensing, and artificial intelligence). Because of this complex nature of the products and the degree of risk in this market, delivering high technical quality directly leads to increased levels of customer trust in the service provider.

Theoretical and managerial implications
The theoretical implications follow from the limitations of our current research, which can give rise to new ideas and developments regarding the measurement of service quality and its implications for a service provider. First, since this study was conducted in a business-to-business setting its external validity is limited. This industrial setting can be characterised by intensive contact between buyers and sellers, which indicates the importance of establishing strong relationships and the need for relationship marketing. However, in other services settings with less frequent buyer-seller interactions the relationships between service quality, its dimensions and customer evaluations in terms of satisfaction and trust might be of a different nature. With respect to service quality it is plausible that in other settings different aspects of service quality are more relevant than the four dimensions that were investigated in this study. Therefore, the research should be extended to other research areas in order to

evaluate its validity. Second, concepts were measured at one point in time, thus essentially from a static perspective. It may be useful to study customer satisfaction and trust in the service organisation over time and apply a longitudinal design in order to take into account the dynamics of business relationships. Furthermore, satisfaction was measured by using a single-item measurement. Future research could apply a more differentiated method of measuring customer satisfaction, for example by using a multi-item scale focusing on different service related aspects. Fourth, interactions between service quality dimensions were neglected in this study, whereas they could play a significant role. Finally, no attention was paid to the relationship between customer satisfaction and trust and therefore we are not able to explicitly address the causality between these constructs.

From a managerial perspective the results clearly indicate the importance of high levels of perceived overall service quality, since it will contribute to both customer satisfaction and trust between the organisation and its customers. More specifically, this requires focusing on training and development of the service employee who is in contact with the customer. Developing training programs, empowering employees to undertake concrete actions, offering adequate reward systems are some of the measures that can be taken to increase the employees' quality level. In addition, the provision of high-quality products and supplies should be another major point of attention for the organisation's management. Furthermore, service providers should give customers the opportunity to express their experiences with the organisation, both positive as well as negative in nature. Especially, increased knowledge on this last category of critical incidents is of great importance to the evaluation of the provider by the customer, since negative incidents have a strong negative impact on customer satisfaction. Incorporating customer suggestions for improvement should ultimately result in better performance on behalf of the service provider. Negative experiences do not necessarily mean that customer satisfaction with the organisation will drop dramatically. The negative impact can be compensated for as long as the overall service quality is perceived to be high enough. More, in particular, focusing on internal planning processes can function as a safety net and should enable a company to reduce the negative effect caused by a negative experience.

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