

Evaluation of User Support: Factors That Affect User Satisfaction With Helpdesks and Helplines

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Abstract—In addition to technical documentation, face-to-face helpdesks and telephonic helplines are a powerful means for supporting users of technical products and services. This study investigates the factors that determine user satisfaction with helpdesks and helplines. A survey, based on the SERVQUAL framework and questionnaire, shows that the SERVQUAL dimensions of customer satisfaction are not applicable in these contexts. Three quality dimensions were found instead: solution quality, the experience of the consultation, and, in the case of a physical environment, the so-called tangibles. Helpdesk customers base their overall quality perceptions mainly on their **experiences** during a consultation, while helpline customers focus strongly on the quality of the **solution** offered. The study also found a connection between the perceived helpline quality and the appreciation of the primary service.

Index Terms—Helpdesk, helpline, SERVQUAL, user satisfaction, user support.

Technical products and services are usually accompanied by several forms of user support, varying from training and user instructions to websites and the availability of technical support. Following Niessink and Van Vliet, a distinction can be made between the **primary** product or service (e.g., a DVD recorder or an internet connection) and the **secondary** service (e.g., the helpdesk or helpline) [1]. The availability of these forms of user support is often considered to be an economic right of customers, included in the deal they made with the supplier of the product or service.

For a long time, many companies have seen their obligation to provide user support in any form as an additional burden, not as an opportunity to satisfy, learn from, and build a relationship with their customers. Gradually, however, the strategic importance of adequate user support for corporate and brand reputation and customer relationships is being acknowledged by more and more companies. This calls for research attention to the evaluation of secondary services and their relation to the consumers' satisfaction with the primary product or service.

USER SUPPORT FACILITIES IN ORGANIZATIONS

This article focuses on a specific form of secondary service, namely help facilities. Customers can visit a **helpdesk** to personally consult an agent about a

problem or question they have. Or they can call a paid or toll-free telephone **helpline** for the same purpose. Within the whole package of user support, such person-to-person help facilities seem to be increasingly important for customers—more than, for instance, user manuals or reference guides. Some important advantages of such help facilities are that they can provide information tailored to the specific needs of the individual customer, that they are highly interactive, and that they represent a personal approach to clients [2]. The importance of a personal approach is supported by a survey study by Govindarajulu, which showed that people tend to prefer informal sources of help (internet sites, friends, and vendors) [3]. The importance of tailored information is underlined by a survey study by Lechner and de Vries among clients of a Dutch cancer information helpline, which showed that different groups among the population demanded very different kinds of information [4].

The performance of a helpdesk or helpline is often evaluated using objective statistics (e.g., waiting time) and cost calculations (e.g., the comparison of costs and benefits). Besides reaching good scores on such objective criteria, the customers' satisfaction with the help facility also seems to be an important performance criterion [5]–[7]. For companies that care about the strategic value of their user support facilities, it is most important to learn about the underlying dimensions of customer satisfaction with help facilities. In a competitive market, satisfying help facilities can be a reason for customers to choose or stay loyal to a supplier of primary services or goods. This study seeks to identify the dimensions on which user support practitioners must concentrate their user support to better meet the needs and wishes of customers.

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Dimensions of Satisfaction With Help Facilities

Only a few survey studies are available that shed light on the possible dimensions of customer satisfaction with user support. As can be seen in Table I, the available research shows little convergence in this respect: rather different dimensions have been found and used so far. Some studies focus on the customers' perception of the help facility's performance [8], [9]; others focus on the customers' characteristics [10].

Since help facilities may be seen as a form of service, it seems fruitful to choose a theoretical framework that has its roots in the field of service marketing. The most prominent framework in this area is the SERVQUAL approach, which was constructed in the US by Parasuraman, Zeithaml, and Berry in 1988 [11], [12]. This framework has been applied in a wide range of service contexts, including banking [13], dental services [14], and the airline industry [15]. SERVQUAL uses the so-called gap model, which aims at identifying possible discrepancies between expected and perceived service experiences [16]. People are assumed to evaluate the quality of services by comparing the service they received with the service they expected. The accumulation of these discrepancies determines the perceived service quality, which in turn affects the customers' satisfaction with the service. If the balance between expectations and experiences is negative, customers will be dissatisfied; if it is positive, they will be satisfied; if it is more or less neutral, their attitudes will most likely be unaffected by the service provided.

In the SERVQUAL model, the expected and perceived service quality are measured using five dimensions [11]:

- (1) **TANGIBLES:** the physical aspects of the organization that promise a certain level of service (e.g., the building, the appearance of personnel).
- (2) **RELIABILITY:** the organization's ability to perform the promised service dependably and accurately.
- (3) **RESPONSIVENESS:** the organization's willingness to help customers and to provide prompt service.
- (4) **ASSURANCE:** the knowledge and courtesy of employees and their ability to inspire trust and confidence.
- (5) **EMPATHY:** the caring, individualized attention of the organization to its customers.

A SERVQUAL survey can result in scores for the performance of each dimension by subtracting the experience score from the expectation score. These scores can show a service's weak or strong points [17]. For example, when a service scores positive on assurance but negative on responsiveness, a service supplier knows where to concentrate to improve the service. Brysland and Curry showed that the use of SERVQUAL can identify "priority issues," and is suitable for benchmarking [18].

Earlier studies have used SERVQUAL for the evaluation of non-marketing services, including information services providers, an IT department, and an application service provider [19]–[24]. The results of these studies suggest that SERVQUAL can be fruitfully used to evaluate both the overall service quality and specific aspects of an

TABLE I
DIMENSIONS OF CUSTOMER SATISFACTION WITH USER SUPPORT SERVICES

Authors	Dimensions Found	Dependent Variable	Service Context
Shaw, DeLone and Niederman [9]	<ul style="list-style-type: none"> • Staff response time • Positive attitude of staff • Documentation to support training • Technical competence of staff 	Satisfaction	University office of information technology
Nilsen and Sein [10]	<ul style="list-style-type: none"> • Awareness • Need for support • User expectations • Perceived importance of computers 	Satisfaction	University end user support
Govindarajulu, Reither and Sethi [8]	<ul style="list-style-type: none"> • Degree of support received on important perceived areas • Proximity of services • Support staff quality • Quality of end-user applications 	User evaluation of support source	Friends and colleagues / Information center / Local MIS staff

organization's service package. The model also proves useful to identify the origins of clients' (dis)satisfaction with a particular aspect of service [19]. This study seeks to provide information on whether it is useful to approach user support from a services marketing perspective.

Some authors point out that the tangibles dimension deserves special attention when evaluating non-marketing services. People consume a service increasingly from the comfort of their own home or workplace and are therefore not (sufficiently) confronted with the organization's tangibles. In such cases, measuring the tangibles dimension is considered useless. In some studies [19], [23], this dimension was therefore omitted from the instrument. Besides, Pitt, Watson, and Kavan [21] found the tangibles construct not reliable.

An important topic of debate concerning the SERVQUAL instrument concerns the issue of assessing the **gap** between customers' expectations of the service and their actual perception of the service at the "moment of truth." One of the problems is that respondents of evaluation studies are normally selected after their confrontation with the service. Cronin and Taylor [25] and Van Dyke, Kappelman, and Prybutok [26] argue that the experience of the "moment of truth" is likely to influence respondents' memory of what they expected **before** the experience or their report of it, because the experience made them realize that their expectations may have been unrealistic. Such processes would make it impossible to validly evaluate the difference between expectations and perceptions of actual performance. In addition, Buttle argues that the evaluation of services may be a much more shallow process than the gap model suggests [27].

As a result of these and other points of critique, Cronin and Taylor propose to leave out the expectations from an evaluation questionnaire, and to restrict the service evaluation to the measurement of actual service perceptions only [28]. Their questionnaire, which they called SERVPERF, appeared not only to take less time for participants to answer, but also to have a higher construct validity, and to measure more variance. It is, therefore, assumed that it measures the actual service quality perceptions of customers better than SERVQUAL does.

Cronin and Taylor also proposed another modification of the original SERVQUAL

questionnaire, adding questions about the importance of all items for the customers' evaluation of the service quality [28]. This modification, however, did not lead to substantially better results than the unweighed SERVPERF approach (confirmed by Brady, Cronin, and Brand [29]), and, therefore, does not outweigh the extra burden that questioning the importance of items places on respondents [28].

A more fundamental issue about SERVQUAL is the question whether the five dimensions really represent the elementary constructs that determine the customers' appreciation of the quality of a particular service. In their introduction of the model, Parasuraman, Zeithaml, and Berry made reservations about the universal nature of the five dimensions, emphasizing that they are meant to serve as a starting point and that the model must be adjusted to the characteristics of the particular service under evaluation [11]. Furthermore, Cronin and Taylor [25] and Buttle [27] found high inter-correlations between the SERVQUAL dimensions, which suggests that they do not represent distinguishable psychological constructs.

The Impact of Satisfaction With User Support

Since secondary services such as help facilities are undeniable costs for the supplier of the primary product or service, it is important to know whether they also add some value. Aside from the fact that user support is often legally obligated or required by contracts, and that it may help to reduce costs of maintenance, complaint handling, and other calamities, the added value of good user support may also lie in the increased satisfaction of customers.

Although it seems reasonable to assume that increased user satisfaction with the secondary service may lead to an increased satisfaction with the primary product or service, there is no empirical evidence that supports this assumption. It is even unknown whether customers are able to make the distinction between a primary product or service and a secondary service. Gremler and Brown claim that it is difficult for people to evaluate a service because they do not know what to compare it with [30]. A secondary service is inextricably linked to a primary product or service, and these two matters may blend into each other in the eyes of the customer. If this happens, the perceived primary product or service quality might influence the perceived quality of the secondary service.

The economic return of high satisfaction may be **LOYALTY TO THE SERVICE PROVIDER**: the willingness of customers to return to the same provider the next time the service is needed. Satisfaction may also lead to increased **LOYALTY TO THE CONTRACT**, which means that satisfied customers are more eager to cooperate with the service provider and to exert themselves to obtain optimal results. Pruyn and Ricketts, who coined the term “loyalty to the contract,” found for instance that satisfied patients of dentists are inclined to pay more attention to their dental care (brushing and flossing), which results in better overall results of the service provided by the dentist [31]. For help facilities, this would mean that satisfied customers are more inclined to do their utmost to comply with the advice or instructions given by the help agent, which will eventually lead to a better performance and fewer follow-up appeals to the help facility.

RESEARCH QUESTIONS AND HYPOTHESES

The service marketing literature suggests that customers’ satisfaction with help facilities will depend predominantly on their evaluations of service quality. The **SERVQUAL** model proposes five dimensions of service quality, but it remains to be seen whether these dimensions will apply to the context of help facilities in the same way they do in other service environments. This leads to the first research question of this study: which dimensions determine customers’ perceived quality of help facilities? The **SERVQUAL** framework suggests the following hypothesis:

H1. Customers’ perceptions of the help facility quality are structured according to the **SERVQUAL** dimensions reliability, responsiveness, assurance, empathy, and—only for helpdesks—tangibles.

The second research question deals with the relationship between quality and satisfaction: What are the antecedents of customer satisfaction with help facilities? The **SERVQUAL** framework proposes two steps in this relationship: the five **SERVQUAL** dimensions are assumed to explain customers’ overall quality perceptions of a help facility, and the overall quality perceptions, in turn, are related to their satisfaction with the help facility. In the **SERVQUAL** framework, **PERCEIVED QUALITY** is defined as: “the consumer’s judgment about a product’s overall excellence or superiority,” where satisfaction deals with a judgment of, in our case, the outcome of a consult of a secondary service [32, p. 3]. This leads to the following two hypotheses:

H2. Each of the dimensions of service quality influences the perceived overall quality of help facilities.

H3. The perceived overall quality of help facilities is positively related to the customers’ satisfaction with help facilities.

The third research question addressed in our study is: What is the relationship between the perceived help facility (secondary service) quality and the perceived primary product or service quality? People have difficulty in evaluating a service because they do not have a point of reference to compare a service with [30]. When there is a secondary service involved, this point of reference may be the primary service, and vice versa. This leads to the fourth hypothesis of this study:

H4. There is a positive reciprocal relationship between the perceived overall quality of the help facility and the perceived primary product/service quality.

The fourth research question relates to the presumed influence of satisfaction with “loyalty to the contract.” How does satisfaction or dissatisfaction with user support influence the clients’ motivation to solve their problem? **MOTIVATION**, or the result of a client’s needs, outcomes, and his or her view on the probability that he or she is capable of achieving the desired result, deals with the extent to which a client is enthusiastic about solving his or her problem after a user support consult and cooperates with the supplier of the secondary service [33]. Therefore, hypothesis five is:

H5. Satisfaction with help facilities positively affects customer motivation.

Fig. 1 shows the last four hypotheses of our study.

METHOD

To test the five hypotheses, two studies were conducted within two different organizations, one focusing on a face-to-face helpdesk, the other on a telephone helpline. In both studies, data was collected by means of a questionnaire. Below we will address the design of the two studies by, respectively, giving a description of the two contexts and of the research instrument used.

Study Contexts The first study involves the (face-to-face) helpdesk of a Dutch regional internet service provider (ISP) for students. The helpdesk is located at a counter in the student union

building. Additional user support is available in the form of manuals, a website, email consulting, and a helpline. For one month, all customers visiting the helpdesk were asked to complete our questionnaire on paper after their visit. This method of recruiting respondents was chosen to ensure that all respondents had experience with the helpdesk, a prerequisite for participation. They then filled out the questionnaire on the spot. Additional respondents were recruited via the ISP's website, where a link to an online version of the questionnaire was placed. Only people who visited the helpdesk at least once were asked to participate. The questionnaire was in Dutch.

The second study involves the (telephone) helpline of a Dutch digital television supplier (DTS). The main type of user support is the helpline. Additional channels are a manual, a website, and helpdesks scattered across the country. A random sample of 2,299 customers was sent an email containing a link to a website with the online questionnaire in Dutch. In the email, customers were asked whether they had experience with the helpline or not. In case they did, they were asked to fill out the questionnaire; if not, they were asked not to participate in the study.

Instrument The customers' perceptions of the help facilities were investigated using a questionnaire based on the SERVQUAL dimensions [12]. In line with the example set by Cronin and Taylor, questions about the customers' expectations were left out; only the customers' perceptions of experienced service were asked [28].

The items of the SERVQUAL questionnaire had to be adapted to the two specific study contexts. In doing so, we tried to stay close to the original items, or, if that was not possible, to create an item

that fit into the overall definition of the dimension concerned. As the items in the original SERVQUAL questionnaire show a lot of overlap, some items were modified to make them more discriminating and to avoid extreme intercorrelation between the dimensions.

Since some dimensions in the SERVQUAL questionnaire consist of four items and others of five, extra items were added so that all dimensions were measured using five items. The main guiding principle in formulating extra items was the definition of the dimensions by Parasuraman, Zeithaml, and Berry [11]. As proposed by Parasuraman, Zeithaml, and Berry, all items were positively formulated [12]. In the case of the helpline, the tangibles construct was omitted from the questionnaire.

As in the SERVQUAL questionnaire, the overall perceived service quality and the customers' satisfaction with the help facilities were both measured using one single item [11]. Measuring these constructs with one item may be regarded as problematic. However, the constructs with one item have proven their worth in numerous studies and are therefore measured the same in our study.

The perceived quality of the primary product/service was measured with six items about the internet connection (ISP), and eight items about the digital television service (DTS), respectively. These items were based on input from the organizations involved, as well as on van Moorsel [34] for the ISP, and Anstine [35] for the DTS.

The customers' motivation was measured with five items, reflecting the aspects of intensity of motivation as defined by Brehm and Self [33]; this definition can be found above.

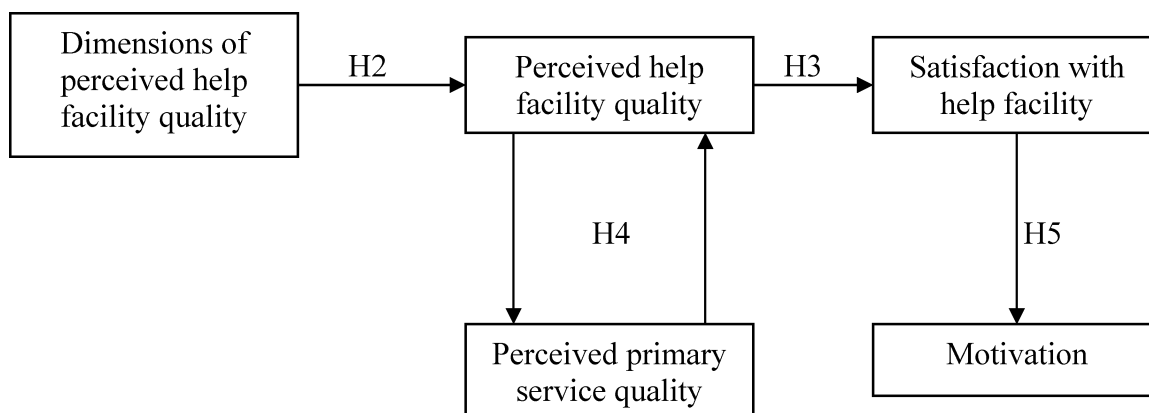


Fig. 1. Hypothesized model of antecedents and results of help facility quality.

All questions were asked using seven-point Likert scales ranging from “totally disagree” to “totally agree.” All items used, as well as the corresponding 1991 SERVQUAL items, may be found in the Appendix.

RESULTS

Response In the ISP study (helpdesk), 64 questionnaires were received. Due to the method of data collection, a response rate could not be calculated. Of the respondents, 91% were male and 9% were female. This male–female ratio corresponds with the (mainly male) student population the ISP provides internet services for. The average age of the respondents was 24.9 years (SD 7.3). Of all respondents, 66% were incidental visitors of the helpdesk, and 28% were regular visitors. For 62% of the respondents, the last consultation of the helpdesk was less than one month ago.

The questionnaire sent out to the customers of the DTS (helpline) had a response rate of 12% (265 participants); 242 questionnaires were usable for analysis (11%). Of the respondents, 72% were male and 28% were female. The average age was 43 years (SD 12.3). The majority of the respondents had consulted the telephone helpline only once (34%) or twice (32%). For most respondents, the last consultation of the helpline was between two and four weeks ago (36%) or between one and three months ago (30%).

Dimensions of the Perceived Help Facility

Quality In both the ISP (helpdesk) and the DTS (helpline) study, a reliability analysis of the

constructs resulted in good Cronbach’s alpha scores for all SERVQUAL dimensions, ranging from .77 to .91 (helpdesk), and from .77 to .94 (helpline). This suggests that the SERVQUAL dimensions adequately reflect the customers’ criteria for evaluating the service quality of the help facilities. However, exploratory factor analyses (using varimax rotation) showed that the structure of the customers’ judgments in both studies differed considerably from the original SERVQUAL dimensions. The threshold for an item to be included in a particular factor was a factor loading of at least .40; items that had factor loadings of .40 or higher on more than one factor were placed in the factor with the highest factor loading.

In the ISP study, three dimensions of helpdesk quality were found (Table II). Two of the items did not belong to any factor and were, therefore, excluded from further analysis. In total, the three factors explained 62% of the variance. The first factor can be characterized as **solution quality** (nine items, Cronbach’s alpha = .93). It includes the correctness of the solutions offered and the promptness with which they were generated. The second factor reflects **experience** (eight items, Cronbach’s alpha = .92). It consists of items that measure how customers were treated at the helpdesk and whether they experienced the consultation as pleasant or not. The last factor corresponds with the SERVQUAL **tangibles** dimension, with the addition of one item (six items, Cronbach’s alpha = .87).

In the DTS study, the exploratory factor analysis resulted in two dimensions of helpline quality

TABLE II
DIMENSIONS OF HELPDESK QUALITY. RESULTS OF EXPLORATORY FACTOR ANALYSIS

Factor 1: Solution quality			Factor 2: Experience			Factor 3: Tangibles		
Items		Factor loading	Items		Factor loading	Items		Factor loading
1.	RL6	.70	1.	RS14	.52	1.	T1	.85
2.	RL7	.74	2.	A17	.69	2.	T2	.85
3.	RL8	.81	3.	A18	.76	3.	T3	.62
4.	RL9	.83	4.	A19	.61	4.	T4	.76
5.	RL10	.78	5.	E21	.74	5.	T5	.73
6.	RS12	.51	6.	E23	.78	6.	RS11	.57
7.	RS13	.57	7.	E24	.77			
8.	RS15	.62	8.	E25	.83			
9.	A16	.70						

Note: Letters before the item numbers refer to SERVQUAL dimension (cf. Appendix).

(Table III), which explained 68% of the variance. The factor structure is similar to the first two factors found in the ISP study. Factor one is solution quality (11 items, Cronbach's alpha = .96), and factor two is experience (nine items, Cronbach's alpha = .89).

In conclusion, the first hypothesis, assuming that the SERVQUAL structure would be applicable in the context of help facilities, must be rejected. Despite the high reliability scores of the original dimensions, both factor analyses consistently revealed that the evaluation of help facilities consists of two main dimensions—solution quality and experience—which may be complemented by a tangibles dimension if applicable. The dimensions found appear to be more generic and straightforward than the five SERVQUAL dimensions.

Antecedents and the Results of User Satisfaction With Help Facilities From the analyses in the above section titled “Dimensions of the Perceived Help Facility Quality,” it may be concluded that the final service quality dimensions used in the two studies were sufficiently reliable scales. Before analyzing the relationships between all variables to test the remaining four hypotheses, we had to establish the reliability of the multi-item variables that were not included in the SERVQUAL questionnaire. The motivation construct had a Cronbach's alpha of .68 in the helpdesk study

(after one item was deleted), and of .77 in the helpline study. The primary service/product quality had a Cronbach's alpha of .86 (helpdesk) and .85 (helpline). Hence, all variables of interest appeared to be sufficiently reliable.

To test Hypotheses 2–5, path analyses were conducted using AMOS 5 [36]. Missing items in the data sets were replaced with mean scores. The reporting of results is according to Raykov, Tomer, and Nesselrode [37].

Regarding the helpdesk (ISP), the hypothesized model did not have a good fit ($\text{Chi}^2 = 111.38$; $df = 14$; $p = .00$; $\text{CMIN}/df = 8.00$; $\text{GFI} = .69$; $\text{TLI} = .46$; $\text{CFI} = .64$; $\text{RMSEA} = .33$). Several hypothesized relations appeared to be nonsignificant: the relations from tangibles to perceived helpdesk quality ($z = .68$; $p < .5$), from satisfaction with the helpdesk to motivation ($z = 1.34$; $p < .19$), from perceived helpdesk quality to primary service quality ($z = 1.22$; $p < .23$), and from primary service quality to perceived helpdesk quality ($z = -.98$; $p < .33$).

After the confirmative stage of the path analysis, an exploratory analysis was conducted to generate an alternative, fitting model. Because of a lack of solid knowledge about customers' satisfaction with help facilities, this process was led by indices provided by AMOS 5. First, all nonsignificant relations were removed. Next, modification indices were added for adjusting and improving the hypothesized model. Correlations were found between the three service quality dimensions: solution quality and experience ($\text{MI} = 36.90$; $\text{par change} = .75$), solution quality and tangibles ($\text{MI} = 17.76$; $\text{par change} = .56$), and experience and tangibles ($\text{MI} = 16.71$; $\text{par change} = .52$). Besides, a relation from solution quality to satisfaction with the helpdesk ($\text{MI} = 9.77$; $\text{par change} = .20$) was indicated. Inclusion of this relation made the relation from solution quality to perceived helpdesk quality nonsignificant ($z = 1.93$; $p < .06$). The resulting alternative model for the helpdesk (see Fig. 2) did fit ($\text{Chi}^2 = 17.46$; $df = 15$; $p = .29$; $\text{CMIN}/df = 1.16$; $\text{GFI} = .92$; $\text{TLI} = .99$; $\text{CFI} = .99$; $\text{RMSEA} = .05$). It shows that perceived helpdesk quality to a large extent is based on the customers' experience when visiting the helpdesk. Satisfaction with the helpdesk is influenced by perceived helpdesk quality and the solution quality. All relations shown in Fig. 2 are significant ($p < .001$).

Regarding the helpline (DTS), the hypothesized model did not fit either ($\text{Chi}^2 = 403.32$; $df = 9.00$;

TABLE III
DIMENSIONS OF HELPLINE QUALITY. RESULTS OF EXPLORATORY
FACTOR ANALYSIS

Factor 1: Solution quality			Factor 2: Experience		
Items		Factor loading	Items		Factor loading
1.	RL1	.76	1.	RS6	.60
2.	RL2	.86	2.	RS9	.64
3.	RL3	.83	3.	A12	.58
4.	RL4	.77	4.	A13	.64
5.	RL5	.88	5.	A14	.63
6.	RS7	.78	6.	A15	.67
7.	RS8	.64	7.	E17	.68
8.	RS10	.85	8.	E18	.62
9.	A11	.87	9.	E20	.63
10.	E16	.61			
11.	E19	.61			

Note: Letters before the item numbers refer to SERVQUAL dimension (cf. Appendix).

$p = .00$; $CMIN/df = 44.81$; $GFI = .72$; $TLI = .39$; $CFI = .63$; $RMSEA = .43$). Again, an exploratory path analysis was conducted, after the nonsignificant relations were removed from the model: from experience to perceived helpline quality ($z = .76$; $p < .45$), and from perceived primary service quality to perceived helpline quality ($z = -.87$; $p < .39$).

Modification indices of the hypothesized model gave further directions for optimizing the model. They implied a correlation between the two service quality dimensions ($MI = 160.81$; $par\ change = 1.16$). They showed an improvement

when the following relations were added: from experience to satisfaction with the helpline ($MI = 22.36$; $par\ change = .28$), from experience to motivation ($MI = 17.40$; $par\ change = .23$), from solution quality to satisfaction with the helpline ($MI = 16.57$; $par\ change = .19$), and from perceived primary service quality to motivation ($MI = 11.91$; $par\ change = .17$). An initially presumed relation from solution quality to motivation ($MI = 4.27$; $par\ change = .09$) appeared to become nonsignificant ($z = .67$; $p < .51$) after the inclusion of the relation from perceived primary service quality to motivation. Inclusion of the relation from the experience to motivation made the relation

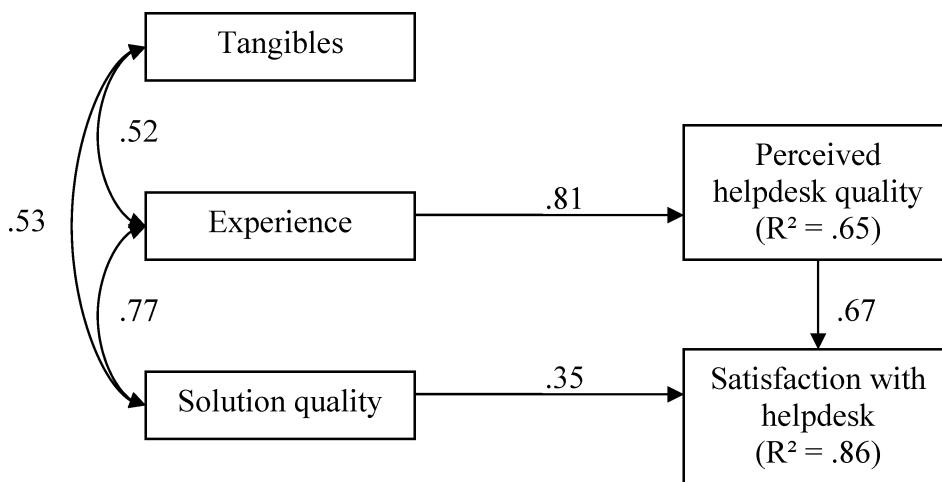


Fig. 2. Alternative model for helpdesk quality.

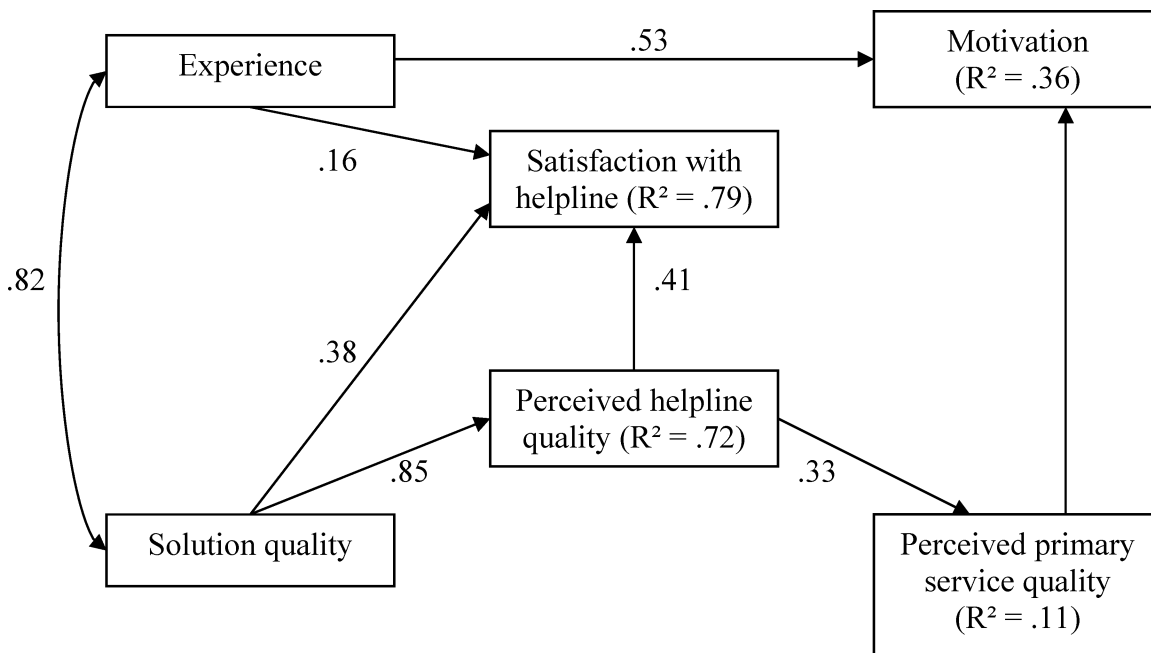


Fig. 3. Alternative model for helpline quality.

from satisfaction with the helpline to motivation nonsignificant ($z = .41$; $p < .69$).

The alternative model (see Fig. 3) did fit ($\text{Chi}^2 = 5.77$; $df = 7$; $p = .57$; $\text{CMIN}/df = .82$; $\text{GFI} = .99$; $\text{TLI} = 1.00$; $\text{CFI} = 1.00$; $\text{RMSEA} = .00$). There is a strong correlation between solution quality and experience. Perceived helpline quality is strongly affected by solution quality. Perceived helpline quality is the strongest antecedent of satisfaction with the helpline, along with solution quality and experience. Furthermore, perceived helpline quality has an effect on the perceived primary service quality, although this is not a very large effect. Finally, motivation is influenced by perceived primary service quality and experience. All relations shown in Fig. 3 are significant ($p < .001$), except for the relation from experience to satisfaction with the helpline, which is still significant, but at another level ($p < .01$).

DISCUSSION

Main Conclusions The results of our study shed light on how customers judge the quality of help facilities that accompany primary products or services. First, our study shows that their judgments are not adequately predicted by the SERVQUAL model. Instead, the evaluation of service quality in this context seems to be limited to two main dimensions: the solution quality offered and the experiences during the consultation. If there is a physical environment, tangibles is also a separate dimension of service quality. In all, our first hypothesis, regarding the suitability of the SERVQUAL dimensions, must be rejected.

A possible explanation for these results may be given by the incidental character of the customer's encounter with the helpdesk or helpline. SERVQUAL is designed to evaluate services where customers do experience an enduring service relationship, like a company's internal user support that is the focus of Carr's study [38]. Such user support, provided by colleagues, is consulted or encountered often and thus a relationship is built. In our cases, however, clients normally do not consult helpdesks and helplines frequently, and as a result, most clients experience service encounters **only once or twice**. Their evaluations of these encounters seem to be more holistic than we presumed, which resulted in a less differentiated perception, consisting of only two or, in the case of helpdesks, three dimensions, instead of the five SERVQUAL dimensions.

Our second hypothesis, assuming that each dimension of service quality would affect the perceived overall quality of help facilities, is partly confirmed. In both studies, only one of the service quality dimensions was strongly related with the perceived overall quality of the help facility. Interestingly, there was a difference between the face-to-face and the telephone situation: in the helpdesk situation, the experience during the consultation was the main antecedent; in the helpline situation, the antecedent of interest was solution quality. Although it may be too early to draw firm conclusions in this respect on the basis of two studies, the difference may reflect the varying nature of the two types of help facilities. A stimuli-rich medium like face-to-face communication may shift the focus of evaluation from solution quality to the more lively experience itself. A telephone conversation provides fewer stimuli, so the communication itself does not have as big an impact on the client and, therefore, the focus is on the solution quality. It should be noted, however, that in both situations the dimensions of service quality showed high intercorrelations.

Our third hypothesis, which stated that there would be a positive relation between the overall help facility quality and the customers' satisfaction with the helpdesk, is confirmed by the data from both studies. The relation, however, appears to be less strong than earlier SERVQUAL and SERVPERF studies suggest. Interestingly, in both studies, there were also direct relationships between service quality dimensions and customer satisfaction. In the helpdesk study, solution quality (which did not significantly affect the perceived overall helpdesk quality) contributed substantially to the customers' satisfaction with the helpdesk. In the helpline study, the two quality dimensions contributed to the customers' satisfaction: the experience during the consultation (which did not affect the perceived overall helpline quality) only had a small effect, whereas the solution quality (which also affected overall quality) had substantial direct influence on customer satisfaction, thus underlining the supremacy of this dimension in the context of helplines.

The fourth hypothesis, assuming a reciprocal relationship between customers' evaluation of the quality of the help facility and the perceived primary product/service quality, was only partly confirmed by the results of our study. The absence of this reciprocal relationship in the helpdesk model and the weak one-way relation in the helpline model suggest that customers make a difference

in evaluating primary and secondary service. Only in the case of the helpline was a one-way relation between the two found: the customers' evaluation of the helpline quality had a relatively small effect on the perceived primary product/service quality.

The fifth hypothesis, which assumed a relationship between customers' satisfaction with the help facility and customers' motivation was not confirmed in both studies. In the helpline study, other factors influencing motivation were identified. There was a direct relation between the experience dimension of service quality and the customers' motivation. Primary service quality also influenced motivation. These findings suggest that the service quality of help facilities may strongly affect the customers' motivation to follow the advice given and to solve the problem. It is as yet unclear why this effect was found in the helpline study and not the helpdesk. One possible explanation would be that the respondents' decision to physically visit a helpdesk might already reflect a stronger motivation than a decision to call a helpline. Customers who make the effort to visit a helpdesk might be assumed to be more intrinsically motivated to follow the advice given and solve the problem.

The practical consequences of our study appear to be quite unequivocal. In order to satisfy helpdesk clients, organizations must provide solutions of high quality, together with a pleasant customer experience. Helpline clients' satisfaction will first and foremost be influenced by the quality of the solutions offered, but their motivation will be strongly affected by the experience. Organizations that want satisfied and motivated customers should, therefore, pay attention to both aspects. The substantial correlations between all service quality dimensions underline that it is important for organizations not to focus on just one dimension.

Limitations and Suggestions for Future Research

Although it seems useful to study the quality of user support facilities from a service-oriented perspective, our study shows that a widely accepted instrument like SERVQUAL does not sufficiently explain the factors that contribute to customers' perceptions of quality and their satisfaction. The two-dimensional structure found in our study (with an additional tangibles dimension for physical service environments) may be used as a starting point for measuring the quality of user support in the future.

Still, it is important to keep in mind that the dimensions following from our study must be treated with caution: they are based on the dimensions and the items originating from the SERVQUAL framework. Our research has demonstrated that the SERVQUAL framework does not correspond well with this context, and this conclusion may not only apply to the dimension structure, but also to the initial selection of items. We cannot preclude that important aspects of the quality of helpdesks and helplines may have been overlooked. Of course, the relatively high predictive power of the service quality dimensions, both for the overall service quality (with R^2_s of .65 and .72), and for the customers' satisfaction (with R^2_s of .79 and .86), suggests that the main dimensions we distinguished will most likely be relevant. Still, it might be fruitful to distinguish subdimensions that may help to provide more diagnostic information about the strengths and weaknesses of a particular helpdesk or helpline.

The development of such subdimensions would require us to take one step back and conduct detailed **qualitative** research into the very specific experiences of customers consulting a helpdesk or helpline. Conversation analysis, for instance, may help to reveal the influence of conversational styles on experience (see for instance [2] and [39]). Furthermore, De Ruyter, Wetzels, and Bloemer state that "the incidental nature of service problems may require incident-based measurement (such as the critical incident technique) rather than more global service attitude measurement research methods" [40, p. 449]. Gremler discusses the methodological aspects of the critical incident technique in the context of service research [41]. Heckman and Guskey already report on the use of the critical incident technique for the evaluation of an information technology helpdesk [42].

Finally, our study underlines the need for an integrated model for user support, including not only help facilities, but also training, tutorials, user documentation, web-based information, etc. A study of the specific contributions made by each of these services to the total user support package, including their contribution to customer loyalty, is an interesting challenge for future research.

APPENDIX

Table IV provides the SERVQUAL items from the questionnaire as adapted to helpdesks and helplines.

TABLE IV
ITEMS ON THE RESEARCH INSTRUMENT

	Original SERVQUAL item	ISP (helpdesk)	DTS (helpline)
Tangibles: Appearance of physical facilities, equipment, personnel and written materials	XYZ's physical facilities are visually appealing	T1. The ISP helpdesk looks visually appealing	
	XYZ has modern looking equipment	T2. The ISP helpdesk looks modern	
	XYZ's employees are neat appearing	T3. The employees of the ISP helpdesk look proper	
		T4. The ISP helpdesk looks inviting	
	Materials associated with the service (e.g., pamphlets or statements) are visually appealing at XYZ	T5. ISP makes a good impression with its helpdesk	
Reliability: Ability to perform the promised service dependably and accurately	When XYZ promises to do something by a certain time, it does so	RL6. The ISP helpdesk always gives me an answer	RL1. The DTS helpline always gives me an answer
	XYZ insists on error-free records	RL7. ISP Helpdesk's instructions are right	RL2. The instructions the DTS helpline gives are right
	When you have a problem, XYZ shows a sincere interest in solving it	RL8. ISP helpdesk's instructions are clear	RL3. The instructions the DTS helpline gives are clear
	XYZ provides its services at the time it promises to do so	RL9. ISP helpdesk's instructions are easy to perform	RL4. The instructions the DTS helpline gives are easy to perform
	XYZ performs the service right the first time	RL10. The solutions from the ISP helpdesk are right at once	RL5. The solutions from the DTS helpline are right at once
Responsiveness: Willingness to help customers and provide prompt service	Employees of XYZ give you prompt service	RS11. I never have to stand long in line at the ISP helpdesk	RS6. I never have to wait long at the DTS helpline before it's my turn
	Employees of XYZ tell you exactly when services will be performed	RS12. The ISP helpdesk always quickly detects what my problem is	RS7. The DTS helpline always quickly detects what my problem is
	Employees of XYZ are never too busy to respond to your requests	RS13. The ISP helpdesk does not give you unnecessary information	RS8. The DTS helpline does not give you unnecessary information
	Employees of XYZ are always willing to help you	RS14. The ISP helpdesk is always willing to help you	RS9. Employees of the DTS helpline are always willing to help you
		RS15. With the help of the ISP helpdesk I always quickly resolve my problem	RS10. With the help of the DTS helpline I always quickly resolve my problem
Assurance: Employees' knowledge and courtesy, and their ability to inspire trust and confidence	The behavior of employees of XYZ instills confidence in customers	A16. The ISP helpdesk instills confidence that my problem will be resolved	A11. The DTS helpline instills confidence that my problem will be resolved
	You feel safe in your transactions with XYZ	A17. I feel at ease when I use the ISP helpdesk	A12. I feel at ease when I use the DTS helpline
	Employees of XYZ are consistently courteous with you	A18. The ISP helpdesk is polite to me	A13. Employees of the DTS helpline are polite to me
		A19. I am not ashamed for using the ISP helpdesk	A14. I am not ashamed for calling the DTS helpline.
	Employees of XYZ have the knowledge to answer your questions	A20. I rather consult the ISP helpdesk than a friend or roommate when I have a problem	A15. I rather consult the DTS helpline than a friend or family when I have a problem
Empathy: Caring, individualized attention given to customers	XYZ gives you individual attention	E21. The ISP helpdesk gives personal advice	E16. The DTS helpline gives personal advice
	XYZ has operating hours convenient to all its customers	E22. The ISP helpdesk has convenient operating hours	E17. The DTS helpline has convenient operating hours
	XYZ has your best interests at heart	E23. The ISP helpdesk has your best interests at heart	E18. The DTS helpline has your best interests at heart
	Employees of XYZ understand your specific needs	E24. The ISP helpdesk understands my wishes	E19. The DTS helpline understands my wishes
	XYZ has employees who give you personal attention	E25. I feel at comfort with the people that work at the ISP helpdesk	E20. I feel at comfort with the people at the DTS helpline
Perceived quality and Customer satisfaction	The quality of XYZ is good	26. The quality of the ISP helpdesk is good	21. The quality of the DTS helpline is good
	I am satisfied with XYZ	27. I am satisfied with the ISP helpdesk	22. I am satisfied with the DTS helpline

Note: All ISP and DTS items are translated from Dutch

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