

# The relationship between service customers' quality assurance behaviors, satisfaction, and effort: A cost of quality perspective

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## Abstract

The overarching purpose of this article is to deepen understanding of customers' roles in service quality assurance. Customers engage in quality assurance behaviors in attempts to increase their satisfaction and to recover from service failures. The non-monetary costs incurred by customers who engage in these behaviors represent largely overlooked costs of quality that can and should be factored into service design and management. Four *customer* costs of service quality are identified using a critical incident methodology to classify service customers' quality assurance behaviors. Then, relationships between customers' quality assurance behaviors and reported levels of effort and satisfaction are tested to better understand the implications of the typology. Finally, we provide some initial suggestions for integrating the quality assurance behaviors of customers with the service management activities of service providers. © 1997 Elsevier Science B.V.

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## 1. Introduction

The evolving body of knowledge regarding customer costs of quality suggests that service customers incur costs, both monetary and non-monetary, in order to increase their likelihood of satisfaction and to recover from the effects of poor quality (Rosander, 1985; Heskett et al., 1990; Lovelock, 1994; Youngdahl and Kellogg, 1994). Service customers tend to be much more involved in service production, or delivery, than their manufacturing counterparts. Many service organizations design co-production into their service delivery systems. How-

ever, customers often choose their own means of service involvement regardless of service design intentions. Often, customers include quality assurance behaviors in their co-production efforts. We examine customers' quality assurance behaviors from the standpoint of quality costs.

This paper presents a typology of *customers'* costs of service quality developed through an adaptation of the critical incident technique (CIT). These non-monetary costs derive from customers' quality assurance behaviors. This research extends earlier exploratory work in developing a customer costs of service quality (CCSQ) classification scheme (Youngdahl and Kellogg, 1994). Additionally, this study tests various relationships between customers' behaviors and reported levels of effort and satisfac-

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tion. Finally, we provide some implications for integrating the quality assurance behaviors of customers with the service management activities of service providers.

## 2. Theoretical background of service customers' quality costs

The concept of the cost of quality (COQ) originated in manufacturing settings, in the 1950s, as a means of justifying staff functions responsible for quality management. In order to promote their activities to company managers, quality specialists needed a means of focusing attention on the bottom-line impact of quality activities (Gryna, 1988). Defect prevention and quality assurance activities yield cost savings from the reduced need to recover from the effects of poor quality. Furthermore, these savings justify the expense of quality management organizations and activities. Juran (1951) suggested seeking a balance point at which the costs of preventing and monitoring quality equal the costs of quality failures. From a prescriptive standpoint, this break-even point could be used to establish and justify the scale of the quality assurance and control efforts. To further facilitate understanding of quality cost relationships, Masser (1957) classified quality costs into the widely used prevention, appraisal, and failure categories.

The presence and participation of customers during service delivery complicate the application of the traditional COQ framework to service settings. In manufacturing, there exists a clear division of labor between employees as producers and customers as consumers. However, service customers can act as both consumers and producers (Lovelock and Young, 1979; Bowen, 1986; Mills and Morris, 1986). Relative to their manufacturing counterparts, service customers become much more intimately involved in production – including their assumption of some quality assurance responsibility.

An additional challenge in applying the prevention–appraisal–failure COQ framework involves the temporal classification of the internal and external categories. The traditional COQ classification, designed for manufacturing settings, refers to internal failure costs as those costs incurred by the firm before the customer is involved. The external failure

costs are incurred by the firm after the customer has been involved through product purchase and use. This decoupling simplifies the classification of quality costs and the collection of quality cost data but ignores the simultaneity of production and consumption common in service settings.

Heskett et al. (1990) modified the interpretation of internal and external failure costs to acknowledge the differences between service and manufacturing. Specifically, they stated that internal failure costs best apply to “back-office” failures, or those that do not occur in the presence of the customer. Examples include service rework, facility downtime, and diminished employee productivity. External failure costs accrue from errors that are actually experienced by the customer during or after service delivery. Furthermore, external failure costs include both verifiable and non-verifiable components. Verifiable costs include easily tracked costs such as scrapping a burnt pizza or refunding money to a dissatisfied customer. Non-verifiable external failure costs include costs not easily tracked by the service organization such as customers' out-of-pocket expenses and non-monetary costs including the effort expended by customers (Lovelock, 1994)

Rosander (1985) proposed adding customer costs as a separate COQ category. This addition highlighted the significance of customers' quality burden. That is, just as companies incur costs related to preventing and responding to the effects of poor quality, so do customers. However, the conceptualization of a separate, unidimensional category did not adequately specify the full range of behaviors and activities driving customers' costs. Given the significant interaction customers have with service delivery and production, a need existed to more fully specify customers' costs of service quality.

Youngdahl and Kellogg (1994) responded to this need by empirically developing a preliminary classification scheme for customers' costs of service quality that resulted in seven distinct quality assurance behaviors. These customer behaviors included preparation, relationship leverage, positive expression, information seeking, information providing, involvement, and negative expression. Although this study provided insight into customers' roles in service quality, the sample size limited the ability to test relationships between the behaviors, effort, and satis-

faction. For example, are certain behaviors more effective than others? Are certain behaviors more costly than others? Do customers engage in different behaviors depending on the type of service?

In this study, we address these limitations and extend our knowledge of customers' roles in service quality by conducting a larger-sample critical incident study with additional survey items used to assess customer effort. One goal of the study is to classify the behaviors from this larger sample to develop a customer costs of service quality typology that can be compared with that found in the Youngdahl and Kellogg (1994) preliminary investigation. However, the greatest contribution to new understanding comes from the ability to test relationships between customers' quality assurance behaviors, effort, and satisfaction. Additionally, we examine service type contingencies in order to isolate the behavioral effects. Testing relationships provides the insight needed to address the managerial implications for integrating customers' quality assurance behaviors with those of the service provider.

### 3. Classification methodology

The CIT was selected as the research method for this study given its appropriateness as a means for developing behavioral categories based on task achievement effectiveness (Flanagan, 1954; Ronan and Latham, 1974) and its applicability to encounter-level service research (Nyquist et al., 1985; Bitner et al., 1990; Kelly et al., 1993). A critical incident is a sufficiently complete behavior that makes a significant contribution, whether positively or negatively, to the achievement of a specific objective (Ronan and Latham, 1974).

The CIT classification procedure involves inductive grouping, or classification, of written accounts of critical incidents. These written accounts can come from direct observations or other survey methods such as interviews or questionnaires. CIT, a qualitative method, relies on analyzing the content of responses (Marshall and Rossman, 1989) to identify patterns from the descriptions of the critical-incident behaviors. These patterns then aid in the development of a classification scheme.

CIT, as a research method, shares the advantages

and disadvantages that are generally attributed to content analysis (Viney, 1983; Weber, 1985; Bitner et al., 1990). The primary advantage of the procedure is the ability to accurately and consistently interpret accounts of events (Viney, 1983). The primary challenge of CIT centers on the fact that the reliability and validity of the method depend on minimizing ambiguity of meaning and applying appropriate coding procedures (Weber, 1985). However, several procedures have been developed to aid in establishing both validity and reliability of CIT classification (Andersson and Nilsson, 1964; Ronan and Latham, 1974; White and Locke, 1981).

#### 3.1. Data collection

The purpose of the data collection process was to develop a suitable sample of critical incidents from which a classification system could be developed. A critical incident was defined as anything a customer did, or tried to do, to positively affect his/her service satisfaction. In addition to identifying customers' quality behaviors, the data collection process was designed to collect information regarding the non-monetary costs and effectiveness of those behaviors.

##### 3.1.1. Instrument

Critical incident data was gathered through a written survey. We queried respondents regarding behaviors associated with both extremely satisfactory and extremely dissatisfactory service encounters. For each encounter, the respondents answered the following four questions:

1. What specific service was this?
2. What was the primary thing that you either did or tried to do to affect the quality?
3. Why did you feel it was necessary to take this action (or not take any action) to affect the quality of the service?
4. (a) Please indicate your level of effort in terms of *time* (none, very little, a little, some, a lot, very much).  
(b) Please indicate your level of effort in terms of *thought*, or intellectual effort (none, very little, a little, some, a lot, very much).  
(c) Please indicate your level of *emotional* effort (none, very little, a little, some, a lot, very much).

The first question was asked to identify the service type for the purpose of examining contingencies. The second question captured the actual customer behavior, or the critical incident. The third question was added to increase our understanding of the motivation for engaging in quality assurance behaviors. Additionally, this question provided some initial insight into the timing (pre-encounter, encounter, or post-encounter) of the behavior. The fourth series of questions were intended to indicate the degree of effort incurred by the customer. A measure for effort was calculated by averaging the three, essentially interval, scales.

Prior to obtaining the CIT sample data required to develop a CCSQ typology, pilot testing of the questionnaire was performed. Personal interviews were conducted to verify respondents' understanding of the survey instrument. Several minor changes were made to increase the clarity of the instrument.

### 3.1.2. Sample

Diverse groups of part-time student subject volunteers, ranging in age from 20 to 62, from the authors' respective universities comprised the respondent group. While all were attending school, most were also fully employed. Their positions ranged from fast-food employees to medical doctors. As displayed in Table 1, respondents reported encounters from a broad range of services. Recall that each respondent completed a separate set of questions for an extremely satisfactory service and an extremely

dissatisfactory service. That is, each respondent contributed two responses to be judged for inclusion as critical incidents.

In order to be included as a critical incident, a response had to: (1) involve some specific action(s) taken by the customer, (2) involve a discrete set of service encounters, (3) involve an extremely satisfactory or extremely dissatisfactory service encounter and (4) provide sufficient detail to be understood by the researcher (criteria adapted from Nyquist et al., 1985). After the data were screened against these criteria, 521 usable critical incidents (250 satisfactory and 271 dissatisfactory) were obtained from 547 responses.

### 3.2. Classification procedure

Deriving categories of quality assurance behaviors from the critical incidents involved two judges, the authors, working independently to sort the critical incidents into conceptual categories while simultaneously defining those categories. The judges performed the iterative process of defining the classification scheme, forming categories and redefining and reforming as new incidents were reviewed. After all incidents were reviewed and category definitions were formulated, incidents were then re-classified using the definitions. This final classification was performed by the authors and a third judge, who was not directly associated with the research project.

The classification process involved seeking convergence by looking for recurring regularities in the descriptions of service customers' behaviors. While many of the categories can be interpreted with respect to cost of quality theory, we attempted to limit bias and allow the categories to flow from the data rather than from extant models (e.g. Youngdahl and Kellogg, 1994). That is, we allowed service customers' descriptions of their quality assurance efforts to define the behavioral categories of the CCSQ typology.

### 3.3. Reliability and validity

Procedures were employed to test the reliability and content validity of the CCSQ behavior categories developed from the CIT process. Potential

Table 1  
Types of services by satisfaction/dissatisfaction

Type of service	Satisfied	Dissatisfied	Total
Automobile purchase	7	5	12
Cleaning	9	8	17
Education	9	11	20
Financial	22	26	48
Health	13	15	28
Information services	6	6	12
Personal	18	12	30
Repair	50	57	107
Restaurant	35	39	74
Retail services	39	46	85
Travel/Lodging	31	15	46
Other	11	31	38
Total	250	271	521

limitations associated with external validity are discussed in the concluding section.

### 3.3.1. Reliability

Inter-rater reliability was assessed using the procedure outlined by Ronan and Latham (1974). Reliability is determined as the intersection of each judge's categorization divided by the union of the categorization. This procedure results in a reliability percentage for each category. The procedure was performed on the final four behavioral categories by the three independent judges. Results are found in Table 2, presented in the next section along with descriptions of the categories. Ronan and Latham suggest that classification systems with reliability over 80% are considered satisfactory. Reliability indices ranged from 88.3% to 99.5%.

### 3.3.2. Content validity

The first procedure used to assess the content validity of the categories involved determining that the classification of the last 100 incidents resulted in the addition of no more than two additional categories (Andersson and Nilsson, 1964). The second procedure, suggested by Ronan and Latham (1974), involved application of a simple ratio analysis. Using this test, content validity is deemed satisfactory if 90% of the categories appear when 75% of the data have been categorized. Since no new categories were identified after classifying 50% of the data, both tests support the validity of the categories.

## 4. A CCSQ typology

The CIT classification yielded four CCSQs, or quality assurance behaviors, summarized in Table 2. Customers (1) prepare for service encounters, (2) work to develop relationships with service providers, (3) exchange information during the encounter, and (4) intervene when there is an expectation of service failure. These customer behaviors parallel service providers' steps in service delivery. That is, both customers and service providers engage in behaviors and actions aimed at increasing the likelihood of service quality and value. Understanding the nature of customers' parallel quality assurance efforts will provide insight into how to better integrate the efforts of service providers with those of customers.

The classification resulted in a more parsimonious four-category typology than the seven behaviors identified by Youngdahl and Kellogg (1994). More importantly, the new typology better satisfies criteria of internal homogeneity and external homogeneity. Satisfying the first criterion involves demonstrating that the items within each category hold together in a meaningful way. Satisfying the criterion of external homogeneity means that the differences between categories remain bold and clear (Patton, 1990). The earlier categorization included significant conceptual overlap among several categories. Specifically, positive expression and relationship leverage were combined to form a more externally homogeneous category, relationship building. Similarly, negative ex-

Table 2  
Customer costs of service quality typology

CCSQ behavior	Description	Totals	Percent satisfied	Average effort	Standard deviation effort	Inter-rater reliability (%)
Preparation	Preparing for the service by such actions as seeking referrals, researching competitors, and arriving early.	61	70.49	3.28	0.96	93.4
Relationship building	Building a relationship with the service provider through such actions as smiling, offering words of kindness, getting to know providers, "trying to build loyalty", and asking for servers by name.	88	86.36	2.62	0.88	99.5
Information exchange	Providing and seeking information to clarify service expectations and seek status.	151	64.24	3.03	0.97	90.0
Intervention	Providing negative performance feedback and involving oneself in problem diagnosis and resolution.	221	15.38	3.60	0.93	88.3

pression and involvement were combined to form the new intervention category.

The percent extremely satisfied and average effort are also reported for each activity. All behaviors require moderate to high levels of effort. Recall that the CIT methodology called for anchoring responses in extremes, extreme satisfaction or extreme dissatisfaction in this study. Relationship building resulted in the highest frequency of satisfaction while intervention resulted in the lowest frequency. These relationships between CCSQ behaviors, satisfaction, and effort will be explored and described in greater detail in the following sections.

*Preparation* quality assurance behaviors are those engaged in for the purpose of readying oneself for the encounter or selecting a service provider. Preparation includes seeking referrals, researching alternative providers, and gathering information that will be required to perform the service. For example, one person seeking an automobile loan researched different automobiles, determined an acceptable budget and shopped around for the best rate. Another respondent recalled taking reading material to a doctor's appointment since "doctors are always late and I hate to wait with nothing to do".

Customers engage in *relationship building* behaviors during and after encounters to forge new relationships and to maintain existing relationships with service providers. At the service encounter level, Bitner et al. (1990) found that customers tended to be highly satisfied when service providers exhibit social behaviors that extend beyond their role definitions. Additionally, Adelman et al. (1994) proposed that changing social values, the graying of the population, and the growing number of single consumers increase demand for social support. By giving positive reinforcement, customers hope to develop lasting relationships for the purpose of receiving special treatment in the future. For example, one respondent recalling a stay at a resort hotel indicated "when you treat people well, they treat you well and feel good about providing services". When a customer smiles and speaks kindly, s/he is offering social support to, and seeking support from, the service provider. The message relationship-building customers seem to express is that they desire to be treated in a manner deserving of their social support and loyalty.

*Information exchange* involves exchanging refer-

ent information (Hanser and Muchinsky, 1978) for the purpose of clarifying requirements and other service parameters such as hours of operation, service status, and clarifications after the encounter. Customers' information exchange behaviors may be part of an uncertainty-reducing strategy resembling that of new employees (Miller and Jablin, 1991). Faced with uncertainty similar to that of a newly hired employee, service customers seek to understand the nature of the service as well as their roles in the delivery processes. Information exchange behaviors, however, were not limited to uninitiated customers. This strategy was utilized by many customers when they did not understand certain aspects of the service or the service strayed from their expectations.

*Intervention*, the most frequently reported quality assurance behavior, occurs when customers intervene directly in the service delivery process. This behavioral category includes complaining during or after the encounter, assisting in diagnosis, and direct involvement in problem solving. Customers typically intervene when there is an expectation of failure, either from prior experience, word-of-mouth, or imminent or actual service failure. Just as service providers attempt to recover from service failure (Hart et al., 1990), customers may attempt to recover by assuming partial control of the service encounter. Customers reach a threshold at which extensive co-production behaviors are justified regardless of the provider's particular service design intentions. For example, a dry-cleaning customer reported that he not only pointed out each unsuccessfully treated spot but also tagged them with Post-its.

This CCSQ typology provides a starting point for understanding the service customer's role in quality assurance. Next steps, included in this investigation, involve examining relationships between these customer behaviors, satisfaction, effort, and service-specific contingencies. Understanding these relationships can increase our understanding of how to best integrate customers' quality assurance behaviors with those of service providers.

## 5. CCSQ relationships

In addition to developing the CCSQ typology, a key objective of this research is to examine the

relative effectiveness of customers' quality assurance behaviors. That is, do the behaviors relate to satisfaction and are certain behaviors more costly than others? Customers assess the tradeoffs between what they receive from (benefits) and give to (sacrifices) a service encounter (Zeithaml, 1988; Zeithaml and Bitner, 1995). Benefits include customer satisfaction and other salient intrinsic and extrinsic attributes of importance to the customer. Sacrifices include both monetary prices and non-monetary costs. This examination focused on customer satisfaction and non-monetary costs expressed as various forms of effort.

The first question to address is whether or not the CCSQ typology behaviors relate to satisfaction. In the case of the prevention–appraisal–failure COQ framework, prevention activities have a greater positive impact than appraisal and failure-induced activities. Similarly, we hope to find a relationship between CCSQ behaviors and satisfaction.

*Hypothesis 1. CCSQ behaviors are related to satisfaction.*

The cost of CCSQ is determined largely by how much effort customers exert in exercising their quality assurance initiatives. That is, customers incur non-monetary costs in the forms of time, physical effort, and psychological effort (Lovelock, 1994). Considering the prevention–appraisal–failure COQ typology, cost tends to vary with COQ activity. For example, activities related to failure generally result in the greatest costs in both manufacturing and service organizations (e.g. Harrington, 1987). Similarly, we expect to find that effort varies with CCSQ behavior given the varying rationales and commitment levels associated with each behavior.

*Hypothesis 2. CCSQ behaviors are related to level of customer effort.*

Many service typologies have been developed to explain relationships (e.g. Mills and Margulies, 1980; Chase, 1981; Lovelock, 1983; Schmenner, 1986; Haywood-Farmer, 1988; Larsson and Bowen, 1989). For example, the contact model (Chase, 1981) defines relative sales effectiveness and production efficiency based on the contact level of the service provider. Similarly, we expect to find that while satisfaction and effort are both related to CCSQ behaviors, these relationships will be moderated by

service type. That is, the frequency of satisfaction for a given behavior will depend on service type. Similarly, the level of effort associated with a specific behavior will depend on service type.

*Hypothesis 3a. The relationship between CCSQ behaviors and satisfaction is moderated by service type.*

*Hypothesis 3b. The relationship between CCSQ behaviors and effort is moderated by service type.*

The results of testing these hypotheses will provide insight into the effectiveness of CCSQ behaviors. That is, we will better understand the tradeoffs between customers quality assurance effort and their resultant satisfaction. Additionally, testing for service-type interactions will increase our understanding of behavior-selection contingencies as well as the effect of service type on both satisfaction and effort.

## 5.1. Analyses and results

### 5.1.1. Service typology

The face-to-face, real-time nature of the services included in this study led to the choice of a typology applicable to characteristics of these encounters. Mills and Margulies (1980) developed a service typology that was suitable for this data. It is based on the personal interface between the customer and the service organization. The three types of service organizations included in this typology are maintenance-interactive, task-interactive, and personal-interactive.

Examples of maintenance-interactive organizations include routine services offered by financial institutions and insurance companies. The key role of the employee is to maintain stability and security at the service work-flow level. Since customers are generally aware of what needs to be done and how the service needs to be performed, they supervise the service employees (Bowen, 1983) by providing performance feedback to employees.

Examples of task-interactive organizations include repair shops, engineering services, and other services in which the paramount emphasis is placed on the techniques of task accomplishment. The customer has little knowledge of how the service is to be performed. For example, a customer knows that an automobile's engine requires repair, but s/he does

not know how to perform the service. In these service organizations, the balance of power strongly favors the service provider.

Personal-interactive organizations include professional services such as legal, medical, education, and counseling services. For these services, customers are generally imprecise as to both what is needed and how the service should be performed. Employees generate information provided by the customer into knowledge to formulate a service solution. The customer is totally dependent on the service provider to determine both service requirements and process.

Using this established typology, we classified all responses as maintenance-interactive, task-interactive, or personal-interactive. Following the previously described procedure (by Ronan and Latham, 1974), reliability for this classification was 92.8%.

5.1.2. Satisfaction

Given the dichotomous nature of the satisfaction variable – critical incidents were gathered for extremely satisfactory or extremely dissatisfactory service encounters – logistic regression was used to test Hypothesis 1. Logistic regression overcomes the two problems associated with applying ordinary least squares (OLS) linear regression to a dichotomous response variable. First, OLS regression results in systematic error variation because of the dichotomous dependent variable. Second, OLS regression will provide estimates outside of the zero or one values of the dependent variable (Aldrich and Nelson, 1984).

A hierarchical procedure was employed in which the service type variable was entered first in the regression model followed by CCSQ behavior then the interaction between the two variables. A significant increment in  $\chi^2$  would indicate that CCSQ behavior contributed to the variation in effort once the effects of service type were accounted for. Likewise, a significant increment in  $\chi^2$  for the interaction terms would indicate that the interaction contributed to the variation in effort once the effects of both service type and CCSQ behavior had been accounted for. Results are displayed in Table 3.

As evidenced by the change in  $\chi^2$  (187.353;  $p \leq 0.001$ ) after entering CCSQ behavior in the logistics regression equation, Hypothesis 1 is supported. While service type was not found to be

Table 3  
Hierarchical logistic regressions of satisfaction on service type and CCSQ behavior

Variables	$\chi^2$	$\Delta\chi^2$	Log likelihood	Goodness of fit
Service type	4.29		717.12	521.00
CCSQ behavior	4 <sup>c</sup> 191.6	<sup>c</sup> 187.35	529.77	520.87
(Type $\times$ Behavior)	8 <sup>c</sup> 206.98	15.34 <sup>a</sup>	514.44	520.98

<sup>a</sup>  $p \leq 0.05$

<sup>b</sup>  $p \leq 0.01$

<sup>c</sup>  $p \leq 0.001$

related to satisfaction, a strong relationship was found between satisfaction and CCSQ behavior. Additionally, a significant interaction ( $p \leq 0.05$ ) was found when adding the interaction variable (service type  $\times$  CCSQ behavior) to the regression equation, supporting Hypothesis 3a. These relationships are graphically displayed in Fig. 1.

The relationship between satisfaction and CCSQ behavior is evident, particularly when looking at relationship building, information exchange, and intervention. That is, relationship building is related to a higher frequency of satisfaction than are information exchange and intervention behaviors, respectively.

The interaction between service type and CCSQ behaviors is indicated by the varying satisfaction frequencies within the quality assurance behaviors, especially preparation. The significant interaction indicates that the relationship between behaviors and

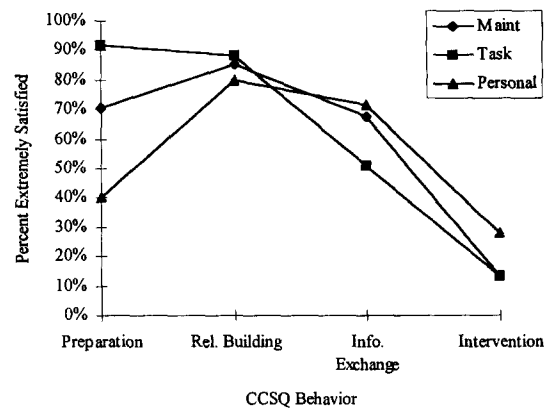


Fig. 1. Satisfaction by CCSQ behavior and service type.



satisfaction is moderated by service type. As seen in Fig. 1, there is little difference in satisfaction by service type for relationship building, information exchange, and intervention. However, for preparation the frequency of satisfaction depends on service type.

For task-interactive encounters, preparation is associated with high satisfaction frequency. Recall that these service organizations are characterized by high level of power disparity. The service provider tends to know much more about the service process. This situation can lead to perceptions of being cheated or, at a minimum, being confused. By preparing through such activities as learning more about a service process, such as computer repair, customers may decrease the power disparity. For maintenance-interactive encounters, preparation becomes somewhat less necessary due to the routine nature of these types of services. Finally, neither the customer nor the service provider can adequately predict service requirements for personal-interactive service encounters. For example, preparing for a session with a psychologist might only serve to further frustrate one's state of mind.

### 5.1.3. Effort

Hypothesis 2, the relationship between CCSQ and effort, required the application of a hierarchical OLS regression model in order to examine the relationships. Similar to previously described hierarchical regression procedure, the service type variable was entered first in the equation followed by the CCSQ variable and the interaction of the two variables. A significant increment in  $R^2$  would indicate that CCSQ behavior contributed to the variation in effort

Table 4  
Hierarchical OLS regressions of effort on service type and CCSQ behavior

Variables	$R^2$	Adjusted $R^2$	$F$	$\Delta R^2$	$\Delta F$
Service type	0.103	0.010	29.843 <sup>c</sup>		
CCSQ behavior	0.220	0.213	29.153 <sup>c</sup>	0.117	25.832 <sup>c</sup>
(Type $\times$ Behavior)	0.229	0.212	13.737 <sup>c</sup>	0.008	0.915

<sup>a</sup>  $p \leq 0.05$

<sup>b</sup>  $p \leq 0.01$

<sup>c</sup>  $p \leq 0.001$

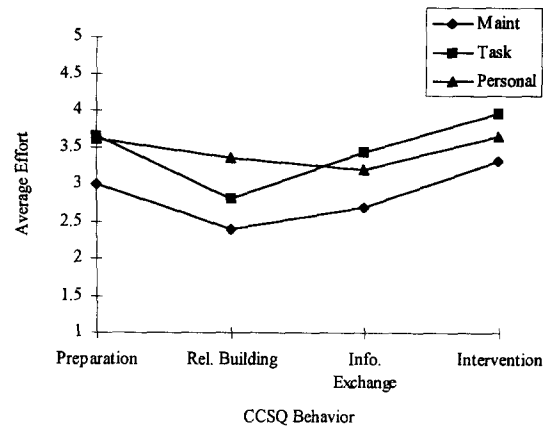


Fig. 2. Effort by CCSQ behavior and service type.

once the effects of service type were accounted for. Likewise, a significant increment in  $R^2$  for the interaction terms would indicate that the interaction contributed to the variation in effort once the effects of both service type and CCSQ behavior had been accounted for.

Results of the hierarchical regressions on the effort variable are found in Table 4 and in Fig. 2. Initially we find that service type was related to effort. Maintenance-interactive services display the least amount of effort. This is due perhaps to the stable and routine nature of these services. Less quality-assurance effort is required from customers than for the other service types. Hypothesis 2 is supported in that a significant relationship was found between effort and CCSQ, accounting for the variance in effort due to service type. The  $R^2$  more than doubled when the CCSQ variable was entered into the regression equation ( $\Delta R^2 = 0.117$ ,  $\Delta F = 25.832$ ;  $p < 0.001$ ). There was no significant interaction. This indicates that the relationship between CCSQ behavior and effort does not depend on service type. Therefore, Hypothesis 3b is not supported.

Taken together, Hypotheses 1 and 2 begin to address important tradeoffs between satisfaction and effort. Hypotheses 3a and 3b provide additional insight into service-type contingency. In order to better understand the implications of these results, Fig. 3 provides a graphical representation of the relationships. Specifically, the figure displays the relative frequency of satisfaction juxtaposed against average

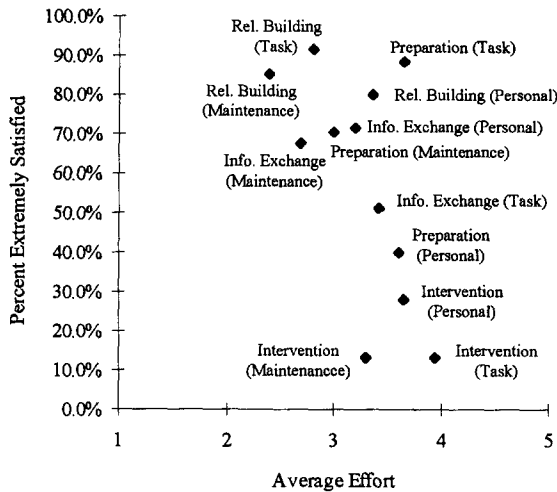


Fig. 3. CCSQ behaviors by satisfaction, effort, and service type.

effort for each behavior across the three service types.

## 6. Implications

The CCSQ typology and its relationship to both satisfaction and effort provides significant insight for service design and delivery. Service system design elements should effectively integrate these customer behaviors. Where possible, customers should be encouraged to use high-satisfaction/low-effort behaviors, in particular those associated with relationship building. In other cases the service provider can mitigate the cost of high effort behaviors through facilitation or by reducing the need for the behaviors in the first place. As displayed in Fig. 3, prescriptions for integrating customers' quality-assurance behaviors into management of service operations may depend on service type.

Fig. 4 presents some preliminary integration strategies. At the bottom of the figure, a generic service system design is shown. The top of the figure displays the CCSQ behaviors aligned with the stages in the service system design. Between the two are possible integration strategies which the firm might use. These strategies will be discussed for each CCSQ behavior. Service-type contingencies will also be addressed.

### 6.1. Preparation

Preparation behaviors often occur before the customer has had any significant contact with the service provider. Integrating these actions into a service system design presents a particular challenge. The service provider must influence the behaviors of customers prior to service delivery.

Preparation tends to involve moderately high levels of effort across service types. The relationship between satisfaction and preparation, however, is moderated by service type. This finding is graphically displayed in both Fig. 1 and Fig. 3. While preparation tends to result in high frequency of satisfaction for both task-interactive and maintenance-interactive organizations, this is not the case for personal-interactive service organizations. For these organizations, where service requirements are generally unknown in advance, preparation becomes particularly challenging.

Even if the exact nature of the service is ill-defined, service providers can assist customers in routine preparation efforts. For example, written material outlining hours of operation, how early to arrive before scheduled appointments, where to park, what to bring, how payment is to be received, or how to contact the service provider can reduce customers' preparation efforts. Alternatively, service providers can reduce customers' preparation efforts by providing realistic service previews (Bowen, 1986; Firanda, 1994). For example, many hospitals provide free tours and informational meetings for scheduled admissions (e.g. surgical or obstetrical patients). These higher-contact previews provide customers with desired preparatory information while increasing sales opportunities for the service provider (Chase, 1981).

### 6.2. Relationship building

This study's findings that customers associated the highest satisfaction with relationship building behaviors fits neatly with the recent emphasis on relationship marketing (Berry, 1983; Gummesson, 1987, Gummesson, 1990; Grönroos, 1989, Grönroos, 1994). Customers, too, appear motivated to engage in behaviors that move service encounters from being merely a transaction to being a relationship.

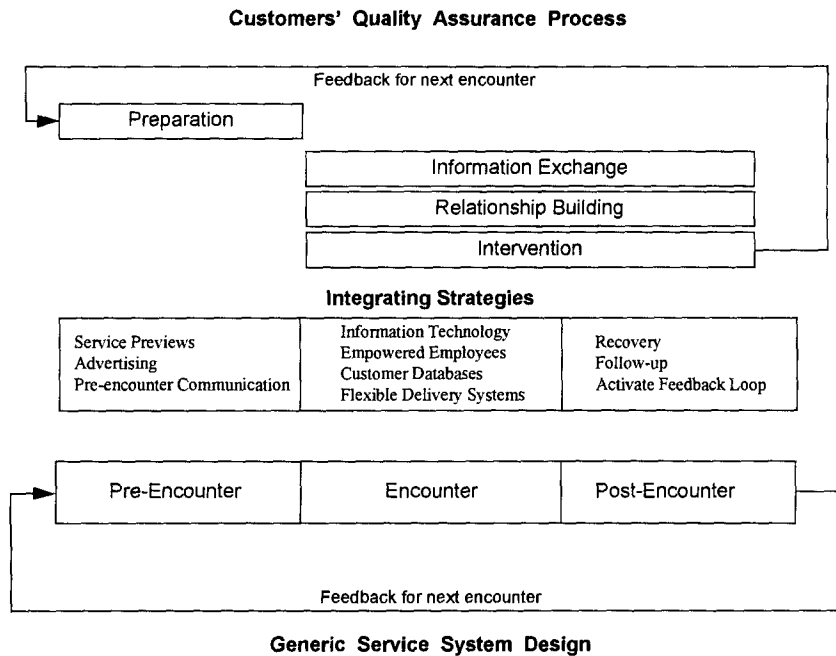


Fig. 4. Integrating CCSQ into service design and delivery.

As displayed in Fig. 3, those who engage in relationship building tend to be highly satisfied. However, this behavior is not effortless, especially in personal-interactive service settings. Regardless of the setting, service providers need to aid customers in establishing and maintaining relationships. For example, employees can wear name tags or be supplied with communication technologies that allow direct access to specific service providers. Additionally, they can be aided by informational systems, such as that used by Marriott, to recognize return customers.

Recognizing a return customer is just the beginning. Customers expect special treatment when they engage in these behaviors. Switching from standard treatment to special, or relationship-based, treatment requires flexibility. Employees must make quick decisions and take action regarding departures from normal operating procedures. Can the customer be seated at the table of the requested waitress? Can the service provider alter the service to meet the known needs of certain customers? Are queues designed so that a customer can use a specific service provider or must the customer "take" whoever is available next? These are just some of the multitude of questions to

be considered when designing the service and empowering employees so that customers can use their relationships with providers. Information technology might aid in the empowerment of service workers by providing the information required to answer such questions and take appropriate actions (Bowen and Lawler, 1992, Bowen and Lawler, 1995).

Other preparation activities involved researching alternatives. The sources of information for this research were quite varied, but included advertising messages, former customers, and consumer reporting sources. Service firms should examine the information content of advertising messages and other pre-encounter communication not only as selling vehicles but as preparation tools. For example, restaurant advertisement can inform potential customers about attire requirements, payment options, and food selection.

### 6.3. Information exchange

Fig. 3 illustrates that, across service types, information exchange tends to result in mid-range satisfaction frequencies and involve mid-range levels of effort. Customers seem to exert considerable effort to

overcome systemic barriers to information flows. The service provider's ability to respond appropriately to information exchange is key. A thorough examination of information exchange processes is required. Customers should not be required to become fluent in the jargon specific to the service firm. Service providers must translate lay language into firm jargon and firm jargon into language understood by customers.

Despite efforts to share a common language, some services involve components that defy customers' abilities to provide information about service requirements. One effective means of facilitating communication is to provide models or other representations of final service outputs. For example, some restaurants display wax models of different menu offerings to facilitate customers' information exchange efforts.

Service providers who understand customers' information needs strive to respond rapidly to information requests in language understood by the customer. Some use information technology to facilitate this process. For example, package delivery firms such as FedEx have automated these information flows allowing customers, sitting at their personal computers, to determine the location and shipping status of their packages within seconds. This technology might prove particularly effective given customers' demonstrated tendencies to engage in these behaviors.

#### 6.4. *Intervention*

Intervention behaviors typically require high level of effort and do not often result in satisfaction. The behavior is somewhat more effective for personal-interactive encounters than other service types. In personal-interactive services, providers tend to be more flexible in tailoring service delivery to meet unique needs. Despite this difference, the intervention is generally ineffective across all service types. Therefore, service providers should design their service delivery system such that customers choose other, more effective behaviors. For example, a service provider can furnish periodic repair status reports to waiting customers. This would encourage customers to use less costly information exchange behaviors.

Other services may benefit from encouraging and

using customers' intervention behaviors. Effectively integrating intervention behaviors into the service firm's delivery system requires a contextual understanding of intervention thresholds, or when customers can no longer sit on the sidelines of the service encounter. How to determine such thresholds represents an untapped, separate stream of inquiry. However, some training in reading of body language and facial expressions as well as improved information flow seems to be a reasonable starting point for recognizing the precursors of these behaviors.

Ultimately the service firm would use triage-like systems to guide intervention-using customers to the appropriate provider. These customers use extraordinary participation. This level of participation requires extraordinary management skills. The firm must determine how best to motivate, monitor, and reward the customer (Bowen, 1986; Mills and Morris, 1986).

If service failure is impending or has already occurred, a detailed service recovery plan should be initiated. Since the extent of service failure is often determined by the customer, the firm should not only expect but encourage intervention behaviors. The customer's unique ability to diagnosis and problem solve will help ensure a successful recovery.

Finally, as displayed in the feedback loop in Fig. 4, customers alter their selections of behaviors based on prior experience. The service firm, too, should continually monitor customers' quality assurance behaviors, effort, and resulting satisfaction. The service firm requires a feedback loop to initiate the necessary changes to the service delivery system.

#### 6.5. *Limitations*

The findings and implications presented in this study are not without limitation. Specifically, external validity of the CCSQ behavioral categories represents a minor limitation of this study for two reasons. First, student volunteers, however diverse in terms of their demographics, might represent a different breed of service customers from those of the entire population of service customers. At a minimum, these service customers differ from the general population in terms of education level. Second, most of the service encounters involved high levels of contact. Seventy-four percent of the services cited required real-time interaction between the customer and the

service provider. Ninety-three percent of the services involved at least some face-to-face contact. Generalization of the typology beyond these relatively high-contact services is not recommended without further investigation. However, a more optimistic interpretation is that customers' quality assurance behaviors represent a high-contact form of customer participation.

## 7. Concluding remarks

The overarching purpose of this article has been to deepen understanding of customers' roles in service quality assurance. To that end, we have presented a CCSQ typology and an empirical investigation of CCSQ relationships. We have also presented some preliminary remarks regarding the implications of the typology.

We strongly embrace the usefulness of the typology for exploring the phenomenon of customer participation in service delivery. The tendency in the literature has been to treat customer participation as an input to the service firm's mix of production resources. By extending cost of quality to include customers' quality costs, we encourage treating customer participation as an extension of the service provider's quality assurance efforts. Doing so creates a rich set of implications for both researchers and managers.

### 7.1. Future research

This research is part of an ongoing program aimed at understanding the customer's role in service quality. Future research efforts will include cross-cultural studies of CCSQ. Additionally, more work needs to be done to understand customers' tolerance for sharing the burden for service quality assurance. That is, when does the quality assurance behavior, itself, add to or detract from the service experience? Finally, we plan to expand the investigation to examine customers' involvement in service quality assurance from the standpoint of customer value in order to better understand the tradeoffs between costs and benefits.

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