



Analysis of quality management practices in services

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Abstract *Theory building efforts in quality management have begun in earnest. However, while services continue to dominate the developed economies of the world, these studies have mostly focused on manufacturing firms. Research that addresses this limitation by specifically addressing quality management in service organizations is presented in this paper. Through a survey of 170 US service firms, this study empirically develops and validates 11 constructs for quality management in services. A comparison between this study and other empirical quality management studies highlights many distinct quality management constructs in services. It also shows that all empirical studies have some gaps in the coverage of their constructs, reiterating the need for continued quality management theory building research in services and manufacturing.*

Introduction

The key role of services in the developed economies of the world is well recognized. The importance of quality to the competitiveness and effectiveness of these services is also broadly accepted. Quality management (QM) initiatives in service companies have been an ongoing effort. These initiatives have met with considerable success in some companies, and have been less successful in others. The theories, concepts and frameworks adopted by service firms have typically been those advocated by Deming, Juran and other quality experts, as well as the practical frameworks of quality awards such as the Malcolm Baldrige National Quality Award, the Deming Prize and the European Quality Award.

The popularity, multi-faceted nature and mixed successes of quality management practices have intrigued academic researchers. Research in quality management has evolved from the analysis of specific successful case studies to an undertaking of scientific theory building. Handfield and Melnyk (1998) discuss the role of various quality management research studies by placing them in the context of the scientific theory building model as formulated by Wallace (1971). This model involves inductive construction of theory from observations and the deductive application of theory developed to observations. The various steps in this theory building process model are

observation, empirical generalization, turning empirical generalizations into theories, hypothesis generation and testing, and logical deduction.

Many quality management empirical studies in recent years have been in the areas of hypothesis generation and testing (Flynn *et al.*, 1994; Black and Porter, 1996; Ahire *et al.*, 1996) and logical deduction (Anderson *et al.*, 1994, 1995; Rungtusanatham *et al.*, 1998). These studies have typically been confined to quality management practices in manufacturing firms. Some studies have dealt with services, but have been focused on specific service contexts such as hospitals (Li, 1997), education (Winn and Cameron, 1998) and hotels (Camison, 1996). This study makes a contribution to the ongoing theory building effort, while also addressing the existing gap in such research that is based only on the broader service industry.

QM in services

There are three distinct issues that arise when we consider QM in services. The first is related to the very definition of quality. The dominance of the goods manufacturing-oriented conformance to specifications definition has given way to the broader customer-based definition of quality. The most commonly used definition of quality currently is the extent to which goods or services meet or exceed customer expectations (Buzzell and Gale, 1987; Gronroos, 1990; Zeithaml *et al.*, 1990). This definition has its roots in the increasingly important role of services and in services quality research (Parasuraman *et al.*, 1985, 1991; Shostack, 1977; Zeithaml, 1981). The dominant role of human interactions that shape customer expectations and perceptions of service quality makes it more difficult to understand and implement quality effectively. These include interactions between providers and customers, as well as the interactions among various providers. This is especially significant in services with a high degree of customer involvement. In addition, difficulties in measurement of customer expectations and perceptions, and an ongoing debate on the differences between customer satisfaction and service quality also exist (Reeves and Bednar, 1994).

The second issue confronting service activities is the dominant emphasis on manufacturing in the QM literature. Juran and Bingham (1974) began addressing services early, while Feigenbaum (1991) maintained a primary focus on tangible goods, assuming QM applications in services were similar to those in manufacturing. Deming's 14 points (Deming, 1986) are principles of transformation for improving management practice and are considered to be equally applicable to manufacturing and service organizations. But a specific application of Deming's principles to services has also been developed (Rosander, 1991). There is now a growing list of case studies and QM applications in the service context as exemplified by the various firms that have won the Malcolm Baldrige National Quality Award. These are representative of an increasing effort in addressing QM in services. Despite these efforts, it must be noted that the empirical literature on QM in services

has only begun to develop in recent years with some industry-specific studies (Camison, 1996; Li, 1997; Winn and Cameron, 1998).

The third issue facing services is the appropriateness of a contingency perspective with reference to QM practices that recommends sensitivity to variation in the organizational context and boundary conditions to applicability (Benson *et al.*, 1991; Chorn, 1991; Laza and Wheaton, 1990; Sitkin *et al.*, 1994; Spencer, 1994). Arguments have been made for the direct transfer of manufacturing-based QM to services without modification (Schonberger, 1992). Despite the limited success of QM efforts in many organizations including manufacturing firms, specific contingencies that may affect QM practices in services have not been articulated (Langevin, 1977). Common criteria continue to exist for manufacturing and service firms in the Malcolm Baldrige National Quality Award and other similar quality awards worldwide. While services are distinct in some ways (Bowen and Schneider, 1988; Chase, 1985; Chase and Tansik, 1983; Gronroos, 1983; Sasser *et al.*, 1978; Shostack, 1977), we do not argue for distinct QM principles or quality award criteria. But it must be noted that the contingency debate with reference to services is not adequately resolved. There is a continuing need to address issues related to the appropriateness and adaptability of various QM practices for services. So it should be no surprise that many service firms are tentative and experimental in their application of quality principles. Also, the diverse nature of services is an additional dimension affecting the implementation of QM principles. Hence there is a need for service specific QM research that addresses the broader service industry.

This study is based only on service firms and the discussion is organized as follows. A review of the related literature is presented which is followed by a description of the survey study. An analysis of the survey data involving an empirical identification and validation of QM constructs is then discussed. The next section develops a comparison between this study and other key empirical QM studies. The paper concludes by highlighting the contributions of this study and with suggestions for future research.

Literature review

The widespread practice of QM has preceded the development of QM theory. In addition, the focus of this study was on actual QM practices being adopted by service organizations. This reality necessitates that practice-based literature be addressed in the development of this study. Much of the QM practitioner literature has its origins in the prescriptive principles of quality gurus including Deming, Juran, Feigenbaum, Ishikawa and Crosby. Specifically, the Ernst & Young and American Quality Foundation (1992) study provides a comprehensive review of QM practices in the United States and other major economies of the world. Also, the Baldrige Award criteria provide an additional framework for QM practices. But this study was not based on the Baldrige Award criteria because many service organizations are in the early stages of

adopting these criteria. Further, the study was not intended to simply validate the Baldrige Award's criteria, but focus on actual practices.

Two important strengths of the Ernst & Young and American Quality Foundation (1992) study are that services were explicitly addressed in the study, and it is a major study that integrated a contingency approach to QM practices. The study identified best practices according to the level of quality performance of the organization. That is, it found that not all methods are equally appropriate or beneficial to all organizations, and that their level of quality performance defines what practices should be used. The study addresses traditional quality practices such as the use of statistical tools and teamwork, contemporary methods like cost of quality and benchmarking, and methods such as value analysis, process simplification, and the use of technology that are not typically associated with quality improvement efforts. The study provides a wide coverage of actual QM practices that are identified as "best practices" in a global context, with reference to services as well as manufacturing organizations.

Research efforts to develop the underlying theory of QM beyond its prescriptive origins have begun in earnest. Many of the QM principles enunciated in the prescriptive and practitioner literature have also been addressed in the management theory literature (Bowen and Schneider, 1988; Dean and Bowen, 1994; Spencer, 1994). Some of these QM practices identified are the extent and nature of quality training (Blackburn and Rosen, 1993; Snell and Dean, 1992) employee involvement and participation in quality improvement efforts (Oliver, 1988; Bowen and Lawler, 1992a; Flynn *et al.*, 1995), the important role of compensation and assessment in QM (Flynn *et al.*, 1995; Lawler *et al.*, 1992; Lawler, 1994; Waldman, 1994), empowerment among employees and in their interaction with customers (Conger and Kanungo, 1988; Bowen and Lawler, 1992b), the growing significance of teams (Scholtes, 1988; Kumar and Gupta, 1991), process improvement methods (Modarress and Ansari, 1989; Anderson *et al.*, 1994, 1995), the need to benchmark within and outside the industry (Camp, 1989), and various approaches to performance measurement (Dixon *et al.*, 1990; Oakland, 1993; Mann and Kehoe, 1994). The role of technology in quality improvement efforts is typically addressed through its role in process innovation that result in improved quality (Davenport, 1993).

QM theory development

Dean and Bowen (1994) suggest directions for theory development derived from the common focus of QM and management theory on organizational effectiveness. Spencer (1994) examines the relationship between QM and models of organizations in an effort to link QM practice and management theory. Other studies have empirically evaluated the dominant prescriptive models. Anderson *et al.* (1994, 1995) articulate a QM theory underlying the Deming management method and undertake an empirical analysis of this theory. They apply exploratory factor analysis to secondary data from the

World-Class Manufacturing Practices project data that includes US and Japanese plants. Their results support the theoretical model. Further, they apply path analysis to investigate the relationships between the QM constructs identified. The results indicate support for many of the relationships in the proposed theory. These studies also hint at the cross-cultural validity of the theory because of the mixed Japanese and US data set. Rungtusanatham *et al.* (1998) take this a stage further by replicating the study in Italy. It represents the beginnings of the development of a universally applicable QM theory based on the Deming management method.

Other studies have attempted to validate empirically the prescriptive framework of the Malcolm Baldrige National Quality Award (Black and Porter, 1996; Winn and Cameron, 1998; Samson and Terziovski, 1999). The Baldrige Award is selected in such studies because it is considered to be a comprehensive and established framework that encompasses the majority of philosophies and strategies espoused by the most influential quality theorists (Winn and Cameron, 1998). The Black and Porter (1996) study found that the empirically derived factors did not match the categories suggested by the Baldrige model. However, the QM constructs developed were supported by theory provided in the established QM literature. Further, the study suggests that similar empirical studies of established quality awards can be used to improve the QM frameworks. However, the study does not indicate the manufacturing or services focus of the 61 organizations that formed the basis of analysis. Winn and Cameron (1998), on the other hand, specifically focus on higher education. Their study is based on a single, large, US midwestern university. While the study acknowledges the issues related to the size and generalizability of the analysis, their results find the individual dimensions of the Baldrige Award appropriate. However, a subsequent path analysis shows the relationships between the Baldrige dimensions in the context of higher education is not consistent with those prescribed by the award framework. This suggests a need to revise the relationships within the Baldrige framework when applying it to higher education. The study contributes to the controversy surrounding the applicability of the Baldrige Award framework to educational institutions, while the application continues in practice. Another study (Forza and Filipinni, 1998) was developed on the basis of a combination of quality awards including the Deming Prize, Baldrige Award and the European Quality Award. It was based on a sample of 43 Italian manufacturing plants and developed six constructs. This study also highlighted the challenges associated with developing QM constructs, especially the difficulty in articulating and defining human resources constructs. The Samson and Terziovski (1999) study used a large database of 1,200 Australian and New Zealand manufacturing firms, and is one of the largest QM empirical studies and was based on the Baldrige Award. The study confirms the Baldrige Award dimensions, but they found that not all of these dimensions had the same influence on organizational performance. The results of these studies that use the QM dimensions of the Baldrige Award and other quality awards show that there are concerns with

the dimensions when empirically tested in some cases. Also, the stated relationships between the dimensions and their impact on organizational performance have been challenged. Hence we need to conduct empirical research to identify QM dimensions empirically and continue to evaluate the dimensions and relationships of quality award frameworks.

Researchers have been conducting such studies through exploratory and confirmatory empirical studies that attempt to identify and validate QM constructs. Saraph *et al.* (1989) identify eight QM constructs based essentially on the principles enunciated by Deming, Crosby, Juran and Ishikawa. They used a sample of 162 managers from manufacturing and service firms to validate the scales of these constructs. One of the main limitations of the study was that it did not consider issues related to customer focus and satisfaction. Flynn *et al.* (1994) define ten QM dimensions derived from empirical and practitioner literature. They used an exploratory factor analysis approach to analyze data from 42 manufacturing plants from three industries and included multiple responses from each facility. Ahire *et al.* (1996) took a different approach to develop and validate 12 QM constructs based on the literature. They undertook a confirmatory factor analysis approach to the refinement and validation of their QM constructs. Their study focused on a single industry, and was based on a total of 371 responses from different plants in the automobile parts industry.

Amongst the key exploratory and confirmatory empirical studies discussed above, only Saraph *et al.* (1989) have explicitly included some unidentified service firms in their study sample, while others focus only on manufacturing firms. Some empirical QM studies have also been conducted in specific service industries. Li (1997) developed six QM constructs in hospitals based on the general and health service quality literature. A sample of 150 community hospitals in three diverse US regions of Florida, Ohio and Oregon were used in this study. The demographic and policy differences in these states provide for a diverse sample. The Li (1997) and Winn and Cameron (1998) studies represent early attempts at conducting empirical QM theory building in services.

This article contributes to the continued effort in QM theory building. It addresses the limited effort in services by specifically developing QM constructs based only on service organizations. It also expands the effort by studying organizations across the United States in a variety of service industries.

Research design

The prescriptive and empirical literature discussed above formed the basis on which a survey instrument was designed for the development of QM constructs in services. Multiple design iterations were made using feedback from faculty experts in QM and survey design. The final questionnaire contained 69 items that addressed QM practices used by organizations, QM outcomes, and organizational information. The target sample for this study was drawn from the membership of the Services Industries Division of the American Society for

Quality (ASQ), which is the premier quality management professional organization in the USA. This sample is appropriate for three main reasons. First, they represent senior executives, senior quality executives, quality managers, and other managers responsible for QM efforts in service organizations and are very likely to have first-hand information regarding QM implementation; second, the respondents belong to an organization of quality professionals whose membership is generally well informed regarding the various aspects of QM, thereby minimizing their bias towards any specific quality model; third, they belong to a group dedicated to the dissemination of QM expertise and information and therefore very likely to participate effectively in this study.

Survey respondents were asked to evaluate their use of each of the QM practices on a five-point Likert scale (1 is “low use” and 5 is “high use”). The respondents included senior executives, senior quality executives, quality managers, and other managers responsible for quality. A total of 680 surveys were mailed. The service organization was the unit of analysis, with only one respondent per organization. In the case of services with multiple units in the USA or globally, as in the case of large hotel groups, only a specific unit was surveyed and it became the unit of analysis. After two mailings, 170 completed responses from as many different service organizations were received, corresponding to a 25 percent response rate. Table I provides a profile of the respondents by service-industry category.

A factor analysis was conducted using the survey data and the reliability of the factor structure was evaluated. The construct, content and predictive validity of the factors were also evaluated. The results of these analyses are reported below. The resulting QM constructs that emerged were then compared with those developed in other key empirical QM studies in the literature.

Industry	Percent
Professional services	13.5
Logistics	11.8
Banking	11.2
Telecommunications	8.2
Health care	7.1
Insurance	6.5
Industrial services	5.3
Manufacturing	5.3
Financial services	4.7
Hospitality	4.7
Government	4.1
Computer services	3.5
Education	2.4
Retail trade	1.8
Others	10.0

Table I.
Profile of respondents

Note: $n = 176$

Analysis and results

A principle components model factor analysis using an oblimin rotation on the 170 valid responses was conducted using the statistical software package SPSS-PC. The oblimin rotation model was appropriate due to the likelihood of interrelated factors in the total quality management environment (Thurston, 1947; Black and Porter, 1996). To assess the appropriateness of the data for factor analysis, several key statistics were examined. First, the communalities derived from the factor analysis were reviewed. These were all relatively large, suggesting that the data set is appropriate (Stewart, 1981). Next, the Kaiser-Meyer-Olkin measure of sampling adequacy was computed. Based on Kaiser and Rice's (1974) evaluative criterion, the result of 0.88493 is considered "meritorious". Finally, the statistic for Bartlett's sphericity test was 7376.5 ($p < 0.000$), providing further evidence that the population variables are independent, and appropriate for factor analysis.

The factor structure was extracted and the reliability of the factors was established using several procedures. Scree plot analysis and eigenvalues greater than one were used to identify the initial factor structure. Several items had low loadings across all factors, indicating lack of fit with the established factors, and were systematically removed according to a procedure prescribed by Comrey (1973). The loadings of the included variables were all above 0.50, with an average of 0.70476. Thirty-one items had more than 50 percent of their variance explained by their respective factor (loadings of 0.71 or more).

The reliability of the factors was checked to support any measures of validity that might be employed. All factors were checked for internal consistency using Cronbach alphas. According to Nunnally (1978), the Cronbach alpha procedure is an estimate of reliability based on the average correlations between items within each factor where 0.6 is sufficient. No values of coefficient alpha were lower than 0.70, with eight beyond the 0.85 level. One factor of the structure contained only two items and required a more conservative measure for reliability. Fornell and Larcker's (1981) ρ_{vc} measures the amount of variance captured by the construct in relation to the amount of variance due to measurement error. For this factor, ρ_{vc} was less than 0.50, showing that the variance from measurement error is greater than the variance captured by the construct. The two-item factor was subsequently dropped from the factor structure, resulting in 11 sufficiently reliable factors extracted from the data containing 51 items. Table II contains a summary of the results of the factor analysis.

Several assessments were made to determine the construct validity of the factors. An individual principle components analysis was conducted on each factor to determine if its set of variables would form a single factor independent of other variables (Nunnally, 1978). All 11 factors were shown to be unifactorial, suggesting each was a valid construct. The KMO measure of sampling adequacy was also used to provide empirical evidence supporting the appropriateness of the data for each unifactorial determination. The KMO values were acceptable, and should be considered in relation to the

Items	Loadings	Cronbach alpha
<i>Factor 1. Compensation</i>		0.9209
Quality as a compensation criterion for non-management personnel	0.776	
Quality as a compensation criterion for middle management	0.745	
Quality as a compensation criterion for senior management	0.669	
Overall changes in compensation practices	0.616	
Revised compensation to reflect team efforts	0.595	
<i>Factor 2. Benchmarking</i>		0.9176
Benchmarking delivery and distribution systems	0.848	
Benchmarking customer contact systems	0.828	
Benchmarking against competitors	0.805	
Benchmarking product/service characteristics	0.765	
Benchmarking as a source of new ideas	0.731	
Benchmarking against "best in class"/"world class"	0.591	
<i>Factor 3. Training management</i>		0.8504
Align training needs to the organization	-0.749	
Ongoing skills training for all employees	-0.738	
Training by in-house experts	-0.685	
Extent of training investment	-0.528	
<i>Factor 4. Empowerment</i>		0.8843
Empowering customer contact personnel	0.802	
Empowering in day-to-day decision making	0.784	
Workers responsible for their quality assurance	0.718	
Encourage independence/interaction among employees	0.663	
Self-managed work teams	0.646	
Highly autonomous improvement teams	0.517	
<i>Factor 5. Technology management</i>		0.7940
Innovative use of technology for product/service quality	0.795	
Evaluating new technology to reduce operating costs	0.789	
Innovative use of technology for ancillary services quality	0.753	
Purchasing technology rather than internal development	0.664	
<i>Factor 6. Assessment</i>		0.9027
Revised assessment procedures to reflect team efforts	-0.782	
Quality as assessment criterion for non-management personnel	-0.747	
Assessment de-emphasizes individual performance	-0.722	
Quality as an assessment criterion for middle management	-0.716	
Quality as an assessment criterion for senior management	-0.685	
<i>Factor 7. Process management</i>		0.7800
Measure the cost of quality	0.776	
Measure cycle time	0.737	
Measure customer complaints	0.709	
<i>Factor 8. Participation</i>		0.8901
Middle management participation in quality specific meetings	-0.795	
Non-management participation in quality specific meetings	-0.688	
Frequency of problem specific meetings	-0.653	
Frequency of general meetings	-0.632	
Senior management participation in quality specific meetings	-0.630	

Table II.
Factor analysis result

(continued)

Items	Loadings	Cronbach alpha
<i>Factor 9. Teamwork</i>		0.7059
Employee participation in company suggestion system	0.746	
Employee participation in cross-functional terms	0.708	
Employee participation in cross-functional terms	0.585	
<i>Factor 10. Training</i>		0.9157
General quality training for middle management	0.815	
General quality training for non-management personnel	0.783	
General quality training for senior management	0.708	
General quality training for new employees	0.585	
Periodic general quality training of all employees	0.515	
<i>Factor 11. Outcome measurement</i>		0.8875
Measure labor productivity	0.834	
Measure process variation	0.756	
Survey of customer feedback	0.745	
Measure utilization of resources	0.568	
Regular measurement of results of improvement effort	0.520	

Table II.

“meritorious” KMO statistic (Kaiser and Rice, 1974) for the original structure that derived the 11 factors. The results of the unifactorial tests, the percentage of variance explained by each factor over its items and the KMO statistics, are provided in Table III.

The results indicate that established factors explain at least 60 percent of the total amount of variance of their respective variable sets. Only a relatively small amount of variance is associated with other causes. The unifactorial tests provide adequate support for the construct validity of each factor (Black and Porter, 1996). Further construct validation would require new data to confirm the existing factors (Cattell, 1978), and can be the basis of future studies specific to services.

Content validity of factors is established when items in a factor effectively represent the domain of the concept being measured (Black and Porter, 1996).

Factor	KMO	Variance explained (%)
Factor 1: compensation	0.78534	76.1
Factor 2: benchmarking	0.88210	71.0
Factor 3: training management	0.78362	69.3
Factor 4: empowerment	0.88095	64.8
Factor 5: technology management	0.75997	63.5
Factor 6: assessment	0.78239	72.6
Factor 7: process measurement	0.69562	69.5
Factor 8: participation	0.85424	70.2
Factor 9: teamwork	0.62709	63.8
Factor 10: training	0.81817	74.8
Factor 11: outcome measurement	0.86326	69.3

Table III.
Unifactorial tests

As indicated in the previous sections, a comprehensive review of the quality literature, both manufacturing and service oriented, was the basis for the development of the instrument in this study. This provided an initial coverage of all aspects of quality as related to services. An informal analysis of the comments from respondents also showed that the instrument was comprehensive in coverage. Malcolm Baldrige and certain state (states in the USA) quality award winners (who identified themselves) commented that “finally, the right questions are being asked”. While this is anecdotal, a more comprehensive review was also conducted after the factor analysis. After the analysis identified 11 factors described in this paper, six independent academic researchers blind-reviewed and accepted them as appropriate. This provided an independent assessment of both the factor labels and the coverage of the items associated with them. In addition, the analysis showed (see Table II) that all relevant item/factor correlations were suitably high, as were the corresponding coefficient alpha values. This is in accordance with Nunnally’s suggestion for item analysis (Nunnally, 1978; Black and Porter, 1996).

Predictive validity of factors is established when a criterion, external to the measurement instrument, is correlated with the factor structure (Nunnally, 1978). Three criteria included in the questionnaire were used for the purpose of showing predictive validity:

- (1) overall quality of services relative to industry competitors;
- (2) profitability compared to industry competitors; and
- (3) productivity relative to industry competitors.

Seven factors (training management, empowerment, technology management, process measurement, teamwork, training and outcome measurement) correlated at the $p < 0.05$ for the productivity criterion described above. Six factors (benchmarking, training management, empowerment, assessment, participation and teamwork) correlated at the $p < 0.05$ with the criterion representing quality described above. Two factors (training management and training) correlated at the $p < 0.05$ with the profitability criterion. Compensation (factor 1) had a correlation with profitability at the $p < 0.1$ level. The relationship between all 11 factors with at least one of the three criterion variables is initial evidence of predictive validity of the derived factor structure.

Comparison of QM constructs

The constructs developed in this study are compared with seven other major QM empirical studies (Table IV). These studies represent the various approaches taken in QM theory development as discussed earlier. The Anderson *et al.* (1995) study represents an approach that develops constructs on the basis of popular prescriptive models. The Deming Management Method was used in this case. Two other studies used in the comparison were based on quality award criteria. The Black and Porter (1996) study was primarily based on the Baldrige Award criteria, and the Forza and Filippini (1998) study was

Baldrige Award (7 criteria)	Anderson <i>et al.</i> (1995) (7 constructs)	Black and Porter (1996) (10 constructs)	Forza and Filippini (1998) (6 constructs)	Saraph <i>et al.</i> (1989) (8 constructs)	Flynn <i>et al.</i> (1994) (10 constructs)	Ahire <i>et al.</i> (1996) (12 constructs)	Li (1997) (6 constructs)	Present study (11 constructs)
Leadership	Visionary leadership	Corporate quality culture	Orientation towards quality	Top management leadership	Quality leadership	Top management commitment	Top management leadership	
Information and analysis		Quality improvement measurement systems, communication of improvement information	Quality data and reporting	Feedback	Benchmarking, internal quality information use	Benchmarking, internal quality information use	Information analysis	Benchmarking
Strategic planning		Strategic quality management	Role of quality department					
HR development and management	Learning, employee fulfillment	Teamwork, structures, people/customer management	Training, employee relations	Employee involvement, training, empowerment	Quality improvement rewards, selection for teamwork potential, teamwork	Workforce development	Compensation, training management, empowerment, participation, training, assessment, teamwork	(<i>continued</i>)

Table IV.
Comparison of QM
constructs

Table IV.

Baldrige Award (7 criteria)	Anderson <i>et al.</i> (1995) (7 constructs)	Black and Porter (1996) (10 constructs)	Forza and Filippini (1998) (6 constructs)	Saraph <i>et al.</i> (1989) (8 constructs)	Flynn <i>et al.</i> (1994) (10 constructs)	Ahire <i>et al.</i> (1996) (12 constructs)	Li (1997) (6 constructs)	Present study (11 constructs)
Process management	Process management, continuous improvement, internal and external cooperation	Operational quality planning, external interface management, supplier relationships	Link with suppliers, link with customers, process control	Supplier management, process management, product design	Interfunctional design process, supplier relationship, process control, cleanliness and organization	Supplier quality management, SPC usage, design quality management	Organizational cooperation, technology leadership	Technology management, process measurement
Customer focus and satisfaction	Customer satisfaction	Customer satisfaction orientation	Customer satisfaction	Customer satisfaction	Customer interaction	Customer focus	Service quality performance	
Business results		Conformance				Supplier performance, product quality		Outcome measurement

developed using a combination of the Deming Prize, Baldrige Award and the European Quality Award criteria. The other studies used in the comparison are the Saraph *et al.* (1989) study, the Flynn *et al.* (1994) study, and the Ahire *et al.* (1996) study. They were developed on the basis of a broad review of the QM literature. The Li (1997) study takes the additional step of also being based on health-care QM literature since it is focused on quality in hospitals. These studies are selected for comparison because they are key empirical QM studies and represent the main approaches being taken by researchers in QM theory development. They also represent a broad spectrum of QM theory development spanning a decade of research conducted in the USA and Europe in manufacturing and service organizations. The constructs from these studies, and the study presented in this article, are classified using the Baldrige criteria. The Baldrige Award is used as a reference model as it represents the most pervasive and universal framework adopted for QM efforts (Samson and Terziovski, 1999).

The constructs in the various studies similar to the Baldrige category of leadership appear as corporate quality culture, orientation towards quality, and variations on the leadership theme. However, such a construct was not empirically identified in this study and represents a limitation.

In the area of information and analysis, the Anderson *et al.* (1995) and the Forza and Filippini (1998) studies do not identify a related construct. While all the other studies isolate constructs related to analysis of quality information, the Black and Porter (1996), Flynn *et al.* (1994) and Ahire *et al.* (1996) studies also define a separate construct focusing on the communication of such information. Only the Ahire *et al.* (1996) study and this study explicitly define a benchmarking construct. This is a distinct identification of an external focus in gathering and analyzing quality information. In our study, this construct addressed the benchmarking of services, delivery processes, for new ideas, and benchmarking against competitors and non-competitors.

The strategic planning for quality construct appears only in the Saraph *et al.* (1989) and Black and Porter (1996) studies, and is not identified in any of the other studies. This appears to be a limitation in many of the frameworks since it represents the link between intent and implementation of quality efforts.

The primacy of human effort in providing services is reflected in the many constructs in the present study that are related to human resource (HR) development and management. The constructs identified in the present study include compensation, training management, employee training, empowerment, participation, assessment, teams, and participation in quality specific meetings. This reflects a comprehensive list of constructs that are not all identified together in the other studies. The Forza and Filippini (1998) study is clearly limited as it does not identify any constructs in this category. The Li (1997) study that deals with health-care services is also limited as it identifies only one HR construct of workforce development that focuses on training. In addition, the Anderson *et al.* (1995), Saraph *et al.* (1989), Ahire *et al.* (1996) and Black and Porter (1996) studies identify employee training. The Black and Porter (1996)

and Flynn *et al.* (1994) studies do not identify the training construct. In addition, our study explicitly identified the training management construct that is not identified by other studies. This highlights the fact that services are still in the phase of determining what QM training is appropriate and therefore require a greater effort at managing training initiatives. It is also an indication of the need to integrate QM training with other employee training that is central to service competitiveness.

With respect to other HR issues, only the Ahire *et al.* (1996) study and our study identified empowerment as a distinct construct. This construct addressed issues related to encouraging and authorizing employees to be empowered to identify and resolve problems, while empowering them with information, knowledge, and a support structure. Only the Anderson *et al.* (1995) study takes this a step further by identifying employee fulfillment construct. It is interesting to note that these two constructs support the notion that empowered and satisfied employees are key to satisfied customers, yet they do not appear in other studies. Also, only the Ahire *et al.* (1996) study and the present study identify employee involvement and participation as distinct constructs, although employee engagement is an essential step in the delivery of quality.

The Black and Porter (1996) study addresses employee recognition through the people/customer management construct, while the Saraph *et al.* (1989) study identifies the employee relations construct. The Flynn *et al.* (1994) study identifies a distinct construct for quality improvement rewards. The present study develops assessment and compensation as distinct constructs, each of which address the issues of linking quality and teamwork to assessment and compensation at various levels in the service organization. These are important constructs because a growing focus on teamwork and a continued emphasis on individual performance send mixed signals to employees, especially in a culture dominated by individual performance.

Only Black and Porter (1996), Flynn *et al.* (1994) and the present study define a distinct construct for teamwork. The Black and Porter (1996) study identifies teamwork structures to represent efforts made to develop organizational structures to support quality improvement initiatives. The Flynn *et al.* (1994) study identifies selection for teamwork potential, and teamwork. The present study addressed the use of cross-functional teams in services through the teamwork construct. In addition, the present study also explicitly ties teamwork to assessment and compensation, as mentioned above. As discussed above, while the other studies combined some of the issues into single constructs, the present study clearly distinguishes the different aspects of HR issues related to QM efforts. This is illustrated by the distinct constructs in the present study for compensation, assessment, empowerment, participation, and teams. This could be due to the critical and unique role of employees in the delivery of services.

There appears to be a variation with regards to the constructs related to process management between studies based on manufacturing and service

firms. Except for the Li (1997) study and the present study, all the other studies in this comparison identify constructs equivalent to product design, supplier management, and process control. These are all consistent with the Baldrige criteria. Only the Li (1997) study and the present study identify technology leadership and management as a construct that includes items related to the use of technology to increase the effectiveness and efficiency of service delivery. This could be interpreted as a reflection of the increased emphasis on technology-based process innovation, and improvement efforts seem to dominate much of the process management in service organizations. The limited use of QM process control techniques and difficulty in identifying with the concept of supplier management is typical of the traditional service management paradigm that is undergoing slow but steady change. The need for internal cooperation in organizations traditionally characterized by silos is evident in the Ahire *et al.* (1996) and Li (1997) studies that identify constructs in this domain. It is interesting to note that in the present study, process measurement was identified as a construct in this area. This construct included measures of cost, time and customer complaints, all of which represent effective measures of a service process. Emerging issues of customer loyalty and retention were, however, not included.

All the studies, except the Saraph *et al.* (1989) study and the present study, identify a construct related to customer focus and satisfaction. This is a limitation in the Saraph *et al.* (1989) study that was conducted in the early phase of QM efforts in organizations, and is internally focused on the organization and on its suppliers. The present study, on the other hand, is unique in that it incorporates customer focused measures into process and organizational outcome measures. This reflects a unique service orientation in which customer issues are integral to the service product and the process of service delivery. The fact that the Li (1997) study that is health-care services based still identifies a separate customer satisfaction construct reflects the emergence of a new concept in that industry, one in which the patient who receives the service is finally being recognized as a customer. This is something that is better established in other services.

The Baldrige criteria specifically require the reporting of organizational or business results that include product/service quality, financial, human resource, and supplier performance results. Only the Ahire *et al.* (1996), Forza and Filippini (1998) and the present studies address this issue with related constructs. While the Forza and Filippini (1998) study is limited to product conformance, the Ahire *et al.* (1996) study identifies constructs for product quality and supplier performance. Our construct of outcome measurement is focused on organizational and customer issues. It also includes measures of QM improvement efforts.

The present study provides a valid instrument and a broad set of QM constructs, and is comparable to the other studies that are discussed above. It is the only study that focused exclusively on services, and is more comprehensive than the Saraph *et al.* (1989) study that partially addressed unidentified

services and the Li (1997) study that dealt only with hospital services. In this way, the present study contributes to the continuing effort of empirically developing a set of QM constructs, and thereby a suitable QM framework.

Conclusion

The purpose of this study was to contribute to the QM theory building efforts in services. This was achieved in the following ways:

- This study identified a gap in QM theory building efforts in the broader service industry. So this empirical study was based on a survey of service firms from a variety of industries across the USA.
- QM constructs in services were identified through exploratory factor analysis based on survey responses from 170 service firms. The factor analysis, reliability and validation procedures were comprehensive. The study defined many distinct QM constructs related to human resource development and management such as compensation, participation and assessment, reflecting the pivotal role of employees in delivering quality services.
- In addition, the construct of technology management identified in this study reflects the link between quality and technology-based process innovation and improvement initiatives in service organizations.
- The constructs of process measurement and outcome measurement identified in this study incorporated traditional customer focus and satisfaction measures. In this way, the study highlights a unique facet of services in which customer issues are an integral and inseparable aspect of the service product, the service delivery process and the service business.
- This study was compared with other similar empirical research studies. This showed that all empirical studies had some gaps in the coverage of their constructs, highlighting the fact that QM theory building research is in the mapping/relationship building stage (Handfield and Melnyk, 1998). The comparison also shows the differing emphasis of the various studies that are driven by the multi-faceted nature of QM. This only reiterates the need for continued QM empirical research, both in services and manufacturing.

This study provides the basis for further services quality research in a number of directions. A comprehensive set of QM constructs should be identified and tested for services by combining the results of this study with relevant portions of other empirical studies. Such studies may also be developed for specific services as this may result in stronger internal consistency of the constructs. Studying the relationship between QM constructs and organizational performance would also contribute to the QM theory building efforts in services. This would facilitate the continued development of QM theory in services.

References

- Ahire, S.L., Golhar, D.Y. and Waller, M.A. (1996), "Development and validation of TQM implementation constructs", *Decision Sciences*, Vol. 27 No. 1, pp. 23-56.
- Anderson, J.C., Rungtusanatham, M. and Schroeder, R.G. (1994), "A theory of quality management underlying the Deming Management Method", *Academy of Management Review*, Vol. 19 No. 3, pp. 472-509.
- Anderson, J.C., Rungtusanatham, M., Schroeder, R.G. and Devaraj, S. (1995), "A path analytic model of a theory of quality management underlying the Deming Management Method: preliminary empirical findings", *Decision Sciences*, Vol. 26 No. 5, pp. 637-58.
- Benson, P.G., Saraph, J.V. and Schroeder, R.G. (1991), "The effects of organizational context on quality management", *Management Science*, Vol. 37 No. 9, pp. 1107-24.
- Black, S.A. and Porter, L.J. (1996), "Identification of the critical factors of TQM", *Decision Sciences*, Vol. 27 No. 1, pp. 1-21.
- Blackburn, R. and Rosen, B. (1993), "Total quality and human resource management: lessons learnt from Baldrige award-winning companies", *Academy of Management Executive*, Vol. 7 No. 3, pp. 49-66.
- Bowen, D.E. and Lawler, E.E. III (1992a), "Total quality oriented human resource management", *Organizational Dynamics*, Spring, pp. 29-41.
- Bowen, D.E. and Lawler, E.E. III (1992b), "The empowerment of service workers: what, why, how, and when", *Sloan Management Review*, Vol. 33 No. 3, pp. 31-9.
- Bowen, D.E. and Schneider, B. (1988), "Services marketing and management: implications for organizational behavior", *Research in Organizational Behavior*, Vol. 10, pp. 43-80.
- Buzzell, R. and Gale, B. (1987), *The PIMS Principles: Linking Strategy to Performance*, Free Press, New York, NY.
- Camison, C. (1996), "Total quality management in hospitality: an application of the EFQM model", *Tourism Management*, Vol. 17 No. 3, pp. 191-201.
- Camp, R.C. (1989), *Benchmarking: The Search for Industry Best Practices that Lead to Superior Performance*, ASQ Quality Press, Milwaukee, WI.
- Cattell, R.B. (1978), *The Scientific Use of Factor Analysis in Behavioral and Life Sciences*, Plenum Press, New York, NY.
- Chase, R.B. (1985), "The 10 commandments of service system management", *Interfaces*, Vol. 15 No. 3, pp. 68-72.
- Chase, R.B. and Tansik, D.A. (1983), "The customer contact model for organization design", *Management Science*, Vol. 49, pp. 1037-50.
- Chorn, N.H. (1991), "Total quality management: panacea or pitfall?", *International Journal of Physical Distribution and Logistics Management*, Vol. 21 No. 8, pp. 31-5.
- Comrey, A.L. (1973), *A First Course in Factor Analysis*, Academic Press, New York, NY.
- Conger, J.A. and Kanungo, R. (1988), "The empowerment process: integrating theory and practice", *Academy of Management Review*, Vol. 13, pp. 471-82.
- Davenport, T.H. (1993), *Process Innovation: Reengineering Work through Information Technology*, Harvard Business School Press, Boston, MA.
- Dean, J.W. and Bowen, D.E. (1994), "Management theory and total quality: improving research and practice through theory development", *Academy of Management Review*, Vol. 19 No. 3, pp. 392-418.
- Deming, W.E. (1986), *Out of the Crisis*, MIT Center for Advanced Engineering Study, Cambridge, MA.

- Dixon, J.R., Nanni, A.J. and Vollman, T.E. (1990), "The new performance challenge: measuring operations for world-class competition", *Business One*, Irwin, Homewood, IL.
- Ernst & Young and American Quality Foundation (1992), *The International Quality Study: Best Practices Report*.
- Feigenbaum, A.V. (1991), *Total Quality Control*, 4th ed., McGraw-Hill, New York, NY.
- Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1994), "A framework of quality management research and an associated measurement instrument", *Journal of Operations Management*, Vol. 11, pp. 339-66.
- Flynn, B.B., Schroeder, R.G. and Sakakibara, S. (1995), "The impact of quality management practices on performance and competitive advantage", *Decision Sciences*, Vol. 26 No. 5, pp. 659-91.
- Fornell, C. and Larcker, D. (1981), "Evaluating structural equation models with unobservable variables and measurement error", *Journal of Marketing Research*, Vol. 28, pp. 39-50.
- Forza, C. and Filippini R. (1998), "TQM impact on quality conformance and customer satisfaction: a causal model", *International Journal of Production Economics*, Vol. 55, pp. 1-20.
- Gronroos, C. (1983), *Strategic Management and Marketing in the Service Sector*, Marketing Science Institute, Cambridge, MA.
- Gronroos, C. (1990), *Service Management and Marketing: Managing the Moments of Truth in Service Competition*, Lexington Books, Lexington, MA.
- Handfield, R.B. and Melnyk, S.A. (1998), "The scientific theory-building process: a primer using the case of TQM", *Journal of Operations Management*, Vol. 16, pp. 321-39.
- Juran, J.M. and Bingham, R.S. (1974), "Service industries", in Juran, J., Gryna, F. Jr and Bingham, R. (Eds), *Quality Control Handbook*, McGraw-Hill, New York, NY.
- Kaiser, H.F. and Rice, J. (1974), "Little Jiffy Mark IV", *Educational and Psychological Measurement*, Vol. 34, pp. 111-17.
- Kumar, S. and Gupta, Y. (1991), "Cross functional teams improve manufacturing at Motorola's Austin plant", *Industrial Engineering*, Vol. 23 No. 5, pp. 32-6.
- Langevin, R.L. (1977), *Quality Control in Service Industries*, American Management Association, New York, NY.
- Lawler, E.E. III (1994), "Total quality management and employee involvement: are they compatible?", *Academy of Management Executive*, Vol. 8 No. 1, pp. 68-76.
- Lawler, E.E. III, Mohrman, S.A. and Ledford, G.E. (1992), *Employee Involvement and Total Quality Management*, Jossey-Bass, San Francisco, CA.
- Laza, R.W. and Wheaton, P.L. (1990), "Recognizing the pitfalls of total quality management", *Public Utilities Fortnightly*, 12 April, pp. 17-21.
- Li, L. (1997), "Relationships between determinants of hospital quality management and service quality performance – a path analytic model", *International Journal of Management Science*, Omega, Vol. 25 No. 5, pp. 535-45.
- Mann, R. and Kehoe, D. (1994), "An evaluation of the effects of quality improvement activities on business performance", *International Journal of Quality & Reliability Management*, Vol. 11 No. 4, pp. 29-44.
- Modarress, B. and Ansari, A. (1989), "Quality control techniques in US firms: a survey", *Production and Inventory Management Journal*, Vol. 2, pp. 58-62.
- Nunnally, J.C. (1978), *Psychometric Theory*, McGraw-Hill, New York, NY.
- Oakland, J.S. (1993), *Total Quality Management*, 2nd ed., Butterworth-Heinemann, Oxford.

- Oliver, N. (1988), "Employee commitment and total quality control", *International Journal of Quality and Reliability Management*, Vol. 7 No. 1, pp. 21-9.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1985), "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 4 No. 4, pp. 41-50.
- Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1991), "Refinement and reassessment of the SERVQUAL scale", *Journal of Retailing*, Vol. 67 No. 4, pp. 420-50.
- Reeves, C.A. and Bednar, D.A. (1994), "Defining quality: alternatives and implications", *Academy of Management Review*, Vol. 19 No. 3, pp. 419-45.
- Rosander, A.C. (1991), *Deming's 14 Points Applied to Services*, ASQ Quality Press, Milwaukee, WI.
- Rungtusanatham, M., Forza, C., Filippini, R. and Anderson, J.C. (1998), "A replication study of a theory of quality management underlying the Deming Management Method: insights from an Italian context", *Journal of Operations Management*, Vol. 17, pp. 77-95.
- Samson, D. and Terziovski, M. (1999), "The relationship between total quality management practices and operational performance", *Journal of Operations Management*, Vol. 17, pp. 393-409.
- Saraph, J.V., Benson, P.G. and Schroeder, R.G. (1989), "An instrument for measuring the critical factors of quality management", *Decision Sciences*, Vol. 20 No. 4, pp. 457-78.
- Sasser, W.E., Olsen, R.P. and Wyckoff, D.D. (1978), *Management of Service Operations*, Allyn & Bacon, Boston, MA.
- Scholtes, P.R. (1988), *The Team Handbook: How to Use Teams to Improve Quality*, Joiner Associates, Madison, WI.
- Schonberger, R.J. (1992), "Total quality management cuts a broad swath – through manufacturing and beyond", *Organizational Dynamics*, Spring, Vol. 20, pp. 16-28.
- Shostack, G.L. (1977), "Breaking free from product marketing", *Journal of Marketing*, Vol. 41 No. 2, pp. 73-80.
- Sitkin, S.B., Sutcliffe, K.M. and Schroeder, R.G. (1994), "Distinguishing control from learning in total quality management: a contingency perspective", *Academy of Management Review*, Vol. 19 No. 3, pp. 537-64.
- Snell, S.A. and Dean, J.W. Jr (1992), "Integrated manufacturing and human resources management: a human capital perspective", *Academy of Management Journal*, Vol. 34, pp. 60-85.
- Spencer, B.A. (1994), "Models of organization and total quality management: a comparison and critical evaluation", *Academy of Management Review*, Vol. 19 No. 3, pp. 446-71.
- Stewart, D.W. (1981), "The application and misapplication of factor analysis in marketing research", *Journal of Marketing Research*, Vol. 18, pp. 51-62.
- Thurston, L.L. (1947), *Multiple Factor Analysis*, University of Chicago Press, Chicago, IL.
- Waldman, D.A. (1994), "The contributions of total quality management to theory of work performance", *Academy of Management Review*, Vol. 19 No. 3, pp. 510-36.
- Wallace, W. (1971), *The Logic of Science in Sociology*, Aldine Atherton, Chicago, IL.
- Winn, B.A. and Cameron, K.S. (1998), "Organizational quality: an examination of the Malcolm Baldrige National Quality framework", *Research in Higher Education*, Vol. 39 No. 5, pp. 491-512.
- Zeithaml, V.A. (1981), "How consumer evaluation processes differ between goods and services", in Donnelly, J. and George, W. (Eds), *Marketing of Services*, American Marketing Association, Chicago, IL, pp. 186-90.
- Zeithaml, V.A., Parasuraman, A. and Berry, L.L. (1990), *Delivering Quality Service*, Free Press, New York, NY.