QUALITY MANAGEMENT PRACTICES: A REVIEW OF THE LITERATURE

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Introduction

In this paper we review the literature on quality management practices. In doing so, it is recognised that theory development and theory testing within this discipline is a relatively recent phenomenon and that much of the emergent literature is somewhat prescriptive. Accordingly, the reviewing process demands a comprehensive differentiation between rigorous contributions and anecdotal evidence.

In structuring the paper, firstly we consider the problems associated with precisely defining quality as a construct and the implications for conducting research. Secondly, in a discipline where prescriptive and anecdotal approaches have traditionally been to the fore, we highlight the recent emergence of a much more rigorous approach to theory building, theory testing and empirical analysis. Thirdly, we review empirical studies of quality management practices and consider seven key quality management practices: top management support, process management, product design, workforce management, quality information, supplier involvement and customer involvement (Flynn, Schroeder and Sakakibara, 1994). Finally, we present a synthesis of the quality management literature.

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Defining Quality

One of the most problematic issues confronting the researcher in quality management is the search for an appropriate definition. Precisely defining such a multi-faceted construct such as "quality" is difficult given the number of possible alternatives available (Hardie and Walsh, 1994). Garvin (1984), in one of the first classifications to appear in the literature, captures this ambiguity by differentiating between definitions of quality which are:

- Transcendental — excellence-of the highest standard;
- Product-based — dependent on the attributes;
- User-based — satisfying or exceeding the wants of customers;
- Manufacturing-based — conformance to requirements, and
- Value-based — value for money.

Similarly, Reeves and Bednar (1994) suggest a four-way classification of quality definitions that incorporates *excellence, value, conformance to specifications* and *meeting and/or exceeding customer requirements.* The strengths and weaknesses of each approach from a research perspective are summarised in Table 1. The diversity inherent in these definitions, they argue, implies that "the quality construct space is so broad and includes so many components that there would be little utility in any model that tried to encompass them all" (p. 441). Significantly, they conclude that "the complexity and multiple perspectives historically associated with the concept have made theoretical and research advances difficult" and that ultimately the "search for a universal definition of quality and a statement of law-like relationships has been unsuccessful" (p. 441).

What then are the research implications of these various definitions? An essential building block for theory development is an understanding of existing definitions and their appropriateness to a given situation (Blalock, 1969). If the meaning of a variable such as quality is subject to a variety of interpretations, it is particularly difficult to formulate propositions describing the relationship with potential explanatory variables (Cameron and Whetton, 1983). Flynn, Schroeder and Sakakibara (1994), in addressing this problem, contend that a key issue in theory development is the "articulation of the distinction between *quality management practices* (input) and *quality performance* (output), which to date has been blurred under the

broad heading of quality" (p. 340). As already noted, the focus of this paper is on quality management practices.

The Research Tradition in Quality Management

Since the 1930s, manufacturing practitioners and academics have identified product/service quality as a key source of competitive advantage (see Shewhart, 1931). But until recently there has been little empirical research on either what this means in practice and whether or not it leads to improved manufacturing and business performance. Now there is a growing body of research addressing these issues, which has been largely inspired on the one hand by the concerns of business, and on the other, by an increasing emphasis on more rigorous empirically-based research amongst the academic community.

Prior to the emergence of this body of research, Powell (1995) argues that the validity of many of the published studies in quality management could be questioned on the grounds that they:

- Were conducted by consulting firms or quality associations (e.g. American Quality Foundation and Ernst & Young, 1993) with vested interests in the results;
- Did not include the experiences of small firms;
- Did not use a control group, and
- Lacked a thorough theoretical grounding.

Likewise Flynn, Schroeder and Sakakibara (1994) argue that much of the emergent literature on quality management is anecdotal, prescriptive and atheoretical in approach and content. They critique the majority of previously published studies on the basis that they:

- Did not include an explicit discussion of the reliability and validity of the instruments (e.g. Reitsperger, Daniel and El-Shaieb, 1990; Ross and Georgoff, 1991; Coulson, 1992);
- Focused on tools and techniques (e.g. Lockyer, Oakland, Duprey and Followell, 1984);
- Emphasised a concern with impediments to adoption (e.g. Eisen, Mulraney and Sohal, 1992; Brandolese, 1994; Redman, Snape and Wilkinson, 1995);
- Were implementation or "how-to" oriented (e.g. Hunter and Beaumont, 1993; Steele, 1993; Goh and Ridgway, 1994; Lahke and Mohanty, 1994; Reed, Lemak and Montgomery, 1996);

TABLE 1: STRENGTHS AND WEAKNESSES OF QUALITY DEFINITIONS

Definition	Strengths	Weaknesses
Excellence	• Strong marketing and human resource benefits • Universally recognisable — mark of uncompromising standards and high achievement	• Provides little guidance to practitioners • Measurement difficulties • Attributes of excellence may change dramatically and rapidly • Sufficient number of customers must be willing to pay for excellence
Value	• Concept of value involves multiple attributes • Focuses attention on a firm's internal efficiency and external effectiveness • Allows for comparisons across disparate objects and experiences	• Difficulty extracting individual components of value judgement • Questionable inclusiveness • Quality and value are different constructs

TABLE 1 CONTINUED

Conformance to specifications	• Facilitates precise measurement • Leads to increased efficiency • Necessary for global strategy • Should force disaggregation of consumer needs • Most parsimonious and appropriate definition for some customers	• Consumers do not know or care about internal specifications • Inappropriate for services • Potentially reduces organisational adaptability • Specifications may become obsolete in rapidly changing markets • Internally focused
Meeting and/or exceeding expectations	• Evaluates from customer's perspective • Applicable across industries • Responsive to market changes • All-encompassing definition	• Most complex definition • Inappropriate for services • Customers may not know expectations • Idiosyncratic reactions • Pre-purchase attitudes affect subsequent judgements • Short-term and long-term evaluations may differ • Confusion between customer service and customer satisfaction

Source: Reeves and Bednar (1994), p. 437.

- Were "state-of-the-art" descriptions which were sector-specific (e.g. Allen and Oakland, 1991) or region-specific (e.g. Modarress and Ansari, 1989; Chen, 1992; Whyte and Witcher, 1992);
- Were limited international comparisons (e.g. Dahlgaard, 1987; Ebrahimpour and Cullen, 1993; Van de Wiele, Dale, Timmers, Bertsch and Williams, 1993; Yavas, 1995).

In this context, the publication of special editions of the *Academy of Management Review* (theory building in quality management) in 1994 and of *Decision Sciences* (empirical research in quality management) in 1995 represent key watersheds in terms of the advancement of research in the subject area. These publications critically assessed the contribution of quality management to both management practice and academic research.

Contemporaneously, three research teams in particular, Adam (1994), Flynn, Schroeder and Sakakibara (1994) and Voss and Blackmon (1994) have had an important impact on the emergent literature in the area. Their contribution has been to conceptualise quality management practices and quality performance and develop reliable measurement scales, thereby facilitating empirical research, which has provided breakthrough support for the relationship between quality practices and business performance. Table 2 summarises some of the key empirical studies in relation to quality management practices and performance.

Quality Practices

Initial identification of a core set of quality management practices and the design of a set of valid and reliable measurement scales can be attributed to Saraph, Benson and Schroeder (1989). They identified eight critical factors of quality management (quality practices) from the existing quality management literature: the role of management leadership and quality policy; the role of the quality department; training; product/service design; supplier quality management; process management; quality data reporting and employee relations. Consequently, Flynn, Schroeder and Sakakibara (1994) developed and tested an instrument that assessed both *quality practices* and *quality performance*. This instrument differs from the foundation established by Saraph et al. (1989) in that it uses the production plant

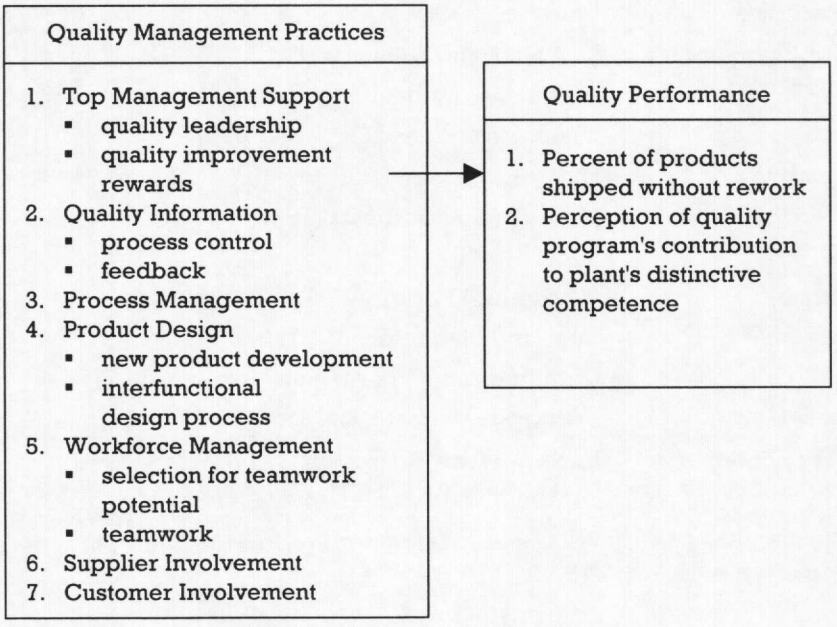
TABLE 2: EMPIRICAL STUDIES OF QUALITY PRACTICES AND PERFORMANCE

Study	Year	Sector	Sample Size	Location	Study Focus	Analysis
Saraph, Benson and Schroeder	1989	Manufacturing and service	162	USA	Practice (scale development)	Factor analysis
Benson, Saraph and Schroeder	1991	Manufacturing and service	152	USA	Organisational Context	Correlation
Motwani, Mahmoud and Rice	1992	Manufacturing	73	India	Practice	Correlation
Vargas and Johnson	1992	Manufacturing	228	Mexico	Practice and performance	Frequency analysis
Adam	1994	Manufacturing	187	USA	Practice and performance (scale development)	Factor analysis Correlation
Adam, Corbett and Rho	1994	Manufacturing and service	359	USA, Korea, New Zealand	Practice and performance by country	Regression
Flynn, Schroeder and Sakakibara	1994	Tools, electronics Transportation	716	USA	Practice and performance (scale development)	Factor analysis Correlation
Maani, Putterill and Sluti	1994	Manufacturing	184	New Zealand	Practice and performance	Structural equation modelling
Mann and Kehoe	1994	All	211	Britain	Practice and performance	Frequency analysis
Voss, Hanson, Blackmon and Oak	1995	All	663	Europe	Country, Size, Sector, Parentage	Correlation
Forza	1995	Auto, Machinery, electronics	646	Italy	Quality information systems (intervening variable)	Correlation

Powell	1995	Manufacturing and service	54	USA	Practice and competitive advantage	Correlation
Tamini	1995	Manufacturing and services	173	USA	Practice (scale development)	Factor analysis
Ahire, Golhar and Waller	1995	Motor vehicle parts	371	USA	Practice (scale development)	Factor analysis
Black and Porter	1995	EFQM members	204	Europe	Practice (scale development)	Factor analysis
Anderson, Rungtusanatham, Schroeder and Devaraj	1995	Metalworking	41 with multiple respondents	USA	Practice and customer satisfaction	Path Analysis
Flynn, Schroeder, Flynn, Sakakibara and Bates	1995	Metalworking	706	USA	Inter-relationships between quality practices/ performance	Path analysis
Forker, Vickery and Droge	1996	Furniture	65	USA	Quality practices and business performance	Regression
Forker, Mendez and Hershauer	1997	Electronics	292	USA	Supplier differences (in efficiency) as intervening variable	Regression, DEA (Data envelopment analysis)
Adam, Corbett, Flores, Harrison, Lee, Rho, Ribera, Samson and Westbrook	1997	Manufacturing	977	USA, Europe, Asia/South Pacific	Country effects as intervening variable	Factor analysis Regression

rather than the business unit as the unit of analysis and is administered to multiple rather than single informants. In addition, quality management practices are categorised into seven key dimensions while quality performance is measured on the basis of percentage of products shipped without rework and perception of quality program's contribution to the plant's distinctive competence (see Figure 1).

FIGURE 1: QUALITY PRACTICES AND PERFORMANCE



Source: adapted from Flynn, Schroeder and Sakakibara, (1994).

Quality awards such as the Baldridge Award and the European Foundation for Quality Management (EFQM) Award are also based on broadly similar sets of practices. The Baldridge Award is scored on nine areas (leadership, information and analysis, strategic quality planning, human resource utilisation, quality assurance of products and services, quality results and customer satisfaction) (Reimann and Hertz, 1994) while the EFQM award is asssessed on ten areas (leadership, resources, policy and strategy, people management, people satisfaction, customer satisfaction, impact on society and business results) (Voss and O'Brien, 1992). It is evident then that the basis of such award schemes closely mirrors the seven quality management practices (top management support, quality infor-

mation, process management, product design, workforce management, supplier involvement and customer involvement) identified by Flynn, Schroeder and Sakakibara (1994). In the following sections, we have therefore adopted their framework to review each of the seven practices in greater detail and consider key empirical studies relating to particular practices (Table 3).

TABLE 3: ILLUSTRATIVE STUDIES OF SPECIFIC QUALITY PRACTICES

Practice	**Study**
Top management support	Lascelles and Dale (1988) Wilkinson, Redman and Snape (1994) Chen, Paetsch and Paulraj (1997)
Quality information	Lockyer, Oakland, Duprey and Followell (1984) Modarress and Ansari (1989) Forza (1995)
Process management	Rayner and Porter (1991) Voss and Blackmon (1993) Ebrahimpour, Withers and Hikmet (1997) Terziovski, Samson and Dow (1997)
Product design	Hanson, Voss, Blackmon and Claxton (1996) Forker, Vickery and Drooge (1996)
Workforce management	Wilkinson, Marchington, Goodman and Ackers (1992) Osterman (1994) Magjuka (1994) Kochan (1995)
Supplier nvolvement	Lascelles and Dale (1989) Larson (1994) Donaldson (1996)
Customer involvement	Parasuraman, Zeithaml and Berry (1985) Garvin(1986) Zeithaml (1988) Swartz and Brown (1989) Teas (1993) Gale (1994)

Top Management Support

Actions and behaviours of senior management with respect to goal-setting, communication, performance measurement/appraisal, and encouraging employee involvement are critical issues in the management of quality (Flynn et al., 1994). Waldman (1994a) notes that much of the quality management literature in this area exhorts managers to adopt a "transformational leadership" style through diligently pursuing the long-term goal of remaining competitive through continuous improvement processes. This form of leadership is one where managers can "shape individuals' self-efficacies and values to perform in such a way as to benefit teamwork to achieve group goals and the continuous improvements of processes" (Waldman, 1994a, p. 521). The dominant feature of this style of leadership is that management should communicate an appealing vision emphasising continuous improvement, teamwork, and customer service and act as role models and provide inspiration for others.

The absence of this type of "visionary" approach to leadership and the difficulty associated with getting top management's complete and honest buy-in can be one of the biggest inhibitors in introducing quality improvement programmes. Ultimately it can result in nothing more than superficial commitment and rhetoric (Dale and Lightburn, 1992; Perisco and McLean, 1994). Maintaining the momentum during a quality improvement programme can be difficult as such interventions frequently proceed through phases of high enthusiasm and much activity, followed by a period of disillusionment, and then by the arrival of some new panacea (Gill and Whittle, 1992). This preoccupation with turning to whatever is currently fashionable in management buzzwords can ultimately undermine the credibility of senior management and nurture a belief amongst employees that a more traditional control-driven management style remains the norm (see Carson and Carson, 1993; Grant, Shani and Krishnan, 1994; Spencer, 1994; Tuckman, 1994).

Given the importance attached to the enabling role of top management and leadership in the quality management literature, it is somewhat surprising that there have been limited empirical cross-sectional studies of this specific issue. Lascelles and Dale (1988) found that the chief executive is a key change agent in quality management interventions. Further down the management ladder, Wilkinson, Redman and Snape (1994) report that insufficient training in quality management was undermining the leadership role of middle management.

Chen, Paetsch and Paulraj (1997) investigated the impact of the quality manager (as distinct from the chief executive) involvement on the quality practice-quality performance relationship. They found that it would be unwise to delegate sole responsibility for leading and managing a quality improvement programme to the quality managers as their influence is not sufficiently pervasive or cross-functional. This confirms Lascelles and Dale's (1988) findings and provides further strong empirical evidence of the significance of top management support and leadership.

Quality Information

High visibility feedback on defect rates, compliance, and schedule adherence are some of the practices associated with diffusing quality information throughout a production plant (Flynn et al., 1994). Feedback to employees regarding their own levels of performance is also a feature of this process (Waldman, 1994b). In addition the use of tools and techniques such as statistical process control (SPC), flowcharts, histograms, Pareto analysis and cause-and-effect diagrams can provide useful insights into quality management issues for both management and shop-floor operators (Ishikawa, 1985; Deming, 1986).

Early empirical studies in this area are primarily descriptive, and focus on the level of adoption of tools and techniques and the associated inhibitors (Lockyer et al., 1984; Modarress et al., 1989). Observing the paucity of rigorous empirical research, Forza (1995) conducted a detailed study of the effect of quality information flows (performance feedback, visible communication tools, customer and supplier data, process documentation and defect identification) on quality performance. He found a significant relationship between these information flows and the defect levels. Effective management of information flows can thus contribute strongly to whether or not a product conforms to specification.

Thus, while there has been little empirical research in this area, there is evidence of the direct contribution to quality performance that can be leveraged from managing quality information flows.

Process Management

Close attention to process management and control is a core issue in the management of quality (Oakland, 1989). Quality practices that typify effective process management include clarity of process own-

ership and boundaries, documenting process management procedures, and cleanliness/organisation of the workplace (Saraph et al., 1989; Flynn et al., 1994).

Documentation of process management procedures has attracted considerable attention in both the practitioner and academic literature. A variety of standards and awards such as the Baldridge and EFQM awards, where organisations are assessed in terms of a selection of quality dimensions, have emerged which have generated considerable debate as to their worth (see Garvin, 1991; Easton, 1993; Reimann et al., 1994; Wisner and Eakins, 1994). One of the most prominent is the International Standards Organisation (ISO) 9000 series of standards (originally based on the British BS 5750 standard) which is sponsored by the International Organisation for Standardisation. The European Union has also adopted a variation of the ISO 9000 entitled EN 29000. These standards provide the basis for establishing, documenting and maintaining a system that ensures the quality of the process. Registration under the series indicates that a firm is meeting a minimum standard for quality systems and, thus can produce and deliver goods or services from processes that meet expected ISO 9000 registration standards (Ebrahimpour et al., 1997).

The standard (and the external audit/certification process) is essentially a conformance-based perspective of quality. The reaction of firms to the standard has been somewhat mixed. Rayner and Porter (1991) found that many firms had a "jaundiced" view of the ISO 9000 series, claiming that the standard guaranteed consistency, not quality. Since the responsibility for documenting processes is the responsibility of applicant firms, there is no mechanism to ensure that the processes are inherently correct. In other words, consistency can mean consistently poor processes and poor performance (Fynes, Ennis and Ryan, 1994). Other scholars have been critical of the standard with regard to the external auditing process (Street and Fernie, 1992); the emergence of a consultancy industry around the standard (Wenmoth and Dobbin, 1994); the levels of bureaucracy attached to the standard (Science and Engineering Policy Studies Unit, 1994); the costs incurred by small companies (McTeer and Dale, 1994; McTeer and Dale, 1996); the degree to which certification is compatible with, and nurtures TQM (Ho, 1995); and how it addresses human resource issues (Yung, 1997).

More extensive studies that have examined the relationship between ISO 9000 certification and quality performance lend some degree of confirmation to the above criticisms. Ebrahimpour, Withers

and Hikmet (1997) found that the major benefits *expected* from ISO 9000 certification were improved product design, process design, product quality and public image but that there was no significant ownership/ parentage effect on successful ISO 9000 implementation.

Terziovski, Samson and Dow (1997) found that ISO 9000 certification did not have a positive effect on overall business performance with, or without, a TQM environment. Equally, Voss and Blackmon (1993) concluded that there is no significant link between ISO 9000 certification and customer satisfaction and that certification is not sufficient in itself to guarantee quality performance. Moreover, they claim that although certification enhances internal processes rather than the external quality attributes, in the case of companies that are not well managed the adoption of BS 5750/ISO 9000 will not lead to overall quality performance without a wider set of changes. One can conclude from the literature that the relationship between ISO 9000 certification and quality performance remains unsubstantiated.

Product Design

Product design practices which can impact on quality performance include the use of simultaneous engineering, cross-functional project teams, frequent design reviews, value analysis, design for manufacturability (DFM), reliability engineering and systematic identification of customer requirements (Flynn et al., 1994; Hanson et al., 1996). Product design contributes to virtually all of Garvin's (1987) critical dimensions of quality (Table 4).

Superior product quality requires good designs, thorough testing and carefully constructed prototypes at the product engineering stage; systematic customer analysis, appropriate product positioning and detailed product plans at the marketing stage; and process management, cost control and efficient set-ups at the manufacturing stage (Wheelwright and Clark, 1992). In this context, Forker, Vickery and Droge's (1996) finding that design-related quality practices had a highly significant relationship with quality performance is important since responsibility for this area is diffused across R&D, marketing, production and finance. This boundary-spanning feature of the product design process can lead to problems with communication, project management, functional myopia and supplier management (Womack, Jones and Roos, 1990).

TABLE 4: THE DIMENSIONS OF QUALITY AND THE FUNCTIONS TYPICALLY RESPONSIBLE FOR THEIR PROVISION

Dimension	Description	Functions
Performance	A product's primary operating characteristics	Design
Features	Secondary characteristics — the "bells and whistles"	Design
Reliability	The probability of a product malfunctioning within a given period	Design
Conformance	The degree to which a product is manufactured to the agreed specification	Manufacturing
Durability	A measure of a product's life in terms of both its technical and economic dimensions	Design
Serviceability	The ease of servicing (planned or breakdown) to include the speed and provision of after-sales service	Design and After-Sales
Aesthetics	How the final product looks	Design
Perceived quality	How the customer views the product	Marketing and Design

Source: Hill (1995), p. 79

Workforce Management

Quality practices in the area of human resource management (HRM) that have been identified in the literature include a systematic and careful approach to recruitment, the use of teamwork and group problem solving, egalitarian work structures, commitment to training, and performance and reward systems (Flynn et al., 1994; Waldman, 1994b). Furthermore, some commentators have suggested that quality management faces its biggest problems in "soft" areas such as workforce management (Wilkinson and Marchington, 1994).

While much of the early research in this area concentrated on quality circles (see Hayward and Dale, 1984), more recent empirical studies in the HRM literature into the interaction between human resource management issues and quality management have focuses on practices which improve quality performance. For instance, Magjuka

(1994) found significant relationships between employee involvement practices (operationalised as team design, membership status, goal-setting and information access) and quality performance. Similarly, Kochan, Gittell and Lautsch (1995) found that quality management interventions are more likely to be sustained in teams that have team-based human resource systems for frontline employees, with team structures, suggestion schemes, meetings, and group rewards. This finding held across all countries and industries studied. They also found that partnership between management and trade unions has a positive impact on the sustainability of quality interventions. Other HRM practices that underpin the adoption of quality management interventions include innovative pay schemes, extensive training and efforts to induce greater commitment on the part of the labour force (Osterman, 1994).

Indeed the absence of "new" HRM practices can significantly undermine a quality improvement programme. Quality management programmes that are "bolted-on", that ignore the role of middle management and the prevailing industrial relations climate and that treat trust and commitment as dispensable are much more likely to fail (Wilkinson et al., 1992).

Supplier Involvement

Fewer dependable suppliers, a reliance on supplier process and quality control, strong buyer-supplier interdependence, an emphasis on quality rather than price and joint product development ("co-makership") are practices which underpin the nature of supplier involvement in quality practices and quality performance (Saraph et al., 1989; Harrison, 1990). Other practices that have been recorded in the literature include the use of long-term contracts, joint problem solving and learning (Lascelles et al., 1989); the emergence of globally approved suppliers (Handfield, 1994); the systematic review and upgrading of procurement systems (Burt, 1989); effective communication (Baxter, Ferguson, Macbeth and Neil, 1989); the development of explicit purchasing/supply management strategies (Carter and Narasimhan, 1994); and the application of vendor assessment/certification procedures (Hellberg and Øyvind, 1990; Giunipero and Brewer, 1993).

Although a number of empirical studies have verified the widespread adoption of such practices, many can be criticised on the grounds of methodological rigour. For example, Larson (1994), in a study of buyer-firm purchasing managers found a significant relation-

ship between buyer-supplier co-operation, higher product quality (operationalised by Garvin's (1987) eight dimensions of product quality) and lower total costs. Likewise, Carter and Ellram (1994) applied statistical analysis to data from a *single* case to conclude that supplier involvement in product design is the single most critical factor in quality performance. However they noted that many supplier firms find this a threatening scenario since it implies sharing long-term strategies, engineering resources and proprietary technology. While one can question the generalisability of this study, Carter and Ellram's (1994) conclusions further underscore the central role of product design and identifies the potentially powerful role of suppliers in this process.

It thus seems then that there is *prima facie* evidence to suggest that buyer-supplier relationships based on the practices outlined above can impact on quality performance, particularly in terms of product design and new product development.

Customer Involvement

Many of the quality management practices associated with supplier involvement apply, in reverse, in the case of customer involvement. Practices, which reflect a high level of customer involvement, include maintaining a close relationship with customers, a proactive approach to customer feedback mechanisms and plant visits (Flynn et al., 1994).

Much of the research on customer involvement remains within the domain of marketing (Dean and Bowen, 1994). For example, Day (1994) in a seminal contribution to the marketing literature argues that there are striking similarities between quality management and customer/market orientation practices, particularly with regard to measuring customer satisfaction and customer perceptions of quality. This is particularly so in the case of service quality where there exists a considerable body of theory development and testing (see Parasuraman et al., 1985; Zeithaml, 1988; Swartz et al., 1989; Teas, 1993)

Empirical studies strongly reinforce the role of customer involvement in product and service quality. In the operations management literature, Garvin (1986) found that plants with the highest levels of quality had permanent customer review boards which tested and evaluated products from the customer's perspective. Similarly, in the marketing literature both Narver and Slater (1990) and Gale (1994) found that customer-driven firms are rewarded with superior performance. Confirmation of the contribution of customer involvement

practices to improved quality performance is thus evident across academic disciplines.

Overview

The foregoing review of the quality management literature highlights a number of issues pertinent to both theory development and the conduct of empirical research. We now provide a synthesis of these issues and identify cumulative shortcomings in this field.

Theory development and rigorous empirical research in this discipline a relatively recent phenomenon. Prior to the early 1990s, much of the literature is anecdotal, prescriptive and questionable with respect to statistical reliability and validity. In addition, methodological issues frequently received insufficient treatment while statistical analysis, if at all present, was of a descriptive nature. The shortcomings evident in much of this work include an emphasis on merely describing the level of adoption of quality tools and techniques (rather than the impact on quality performance), a focus on implementation or "how-to" issues (rather than "why" issues), a tendency to focus on the role of the so-called quality "gurus" and a failure to distinguish between quality practices and quality performance. Thus, while the discipline provides a potentially rich field for scholarly advancement, the available literature is of limited usefulness. It is probably not surprising then that many managers, employees and academics displayed considerable scepticism with respect to the claimed benefits of the TQM approach.

Defining the term quality has very much been an inexact science. The range of definitions suggested in the literature poses problems with respect to precisely measuring the construct. In addition, it poses problems with respect to distinguishing between independent and dependent variables. However, the identification of quality practises as a set of independent variables and quality performance as a dependent variable have considerably advanced the scope for theoretical development.

Empirical studies of quality practices initially focussed on the identification of core quality practices. The series of studies conducted by Schroeder's research team (Saraph et al., 1989; Benson, Saraph and Schroeder, 1991; Flynn et al., 1994; Flynn et al., 1995) have provided valuable contributions in terms of operationalising quality practices and the development and testing of associated measurement scales. Additional empirical studies from the organisational behaviour, human resource management and marketing disci-

plines provide further evidence of the predictive power of specific quality practices.

In conclusion, notwithstanding the cumulative shortcomings associated with much of the initial literature that emerged in this discipline, recent empirical research has extended theory development and testing in the field of quality management, particularly in the context of contingency perspectives. Such contributions reflect the fact that research in the discipline, from an evolutionary perspective, is still very much at a preliminary stage of development and does not match the level of sophistication apparent in other management disciplines such a strategy or organisational behaviour.

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