
Designing Performance Management Systems for Total Quality Implementation

Total Quality
Implementation

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Introduction

Total quality management (TQM) is a management system which has been attracting the attention of North American companies during the last decade. This system is designed as an integrated, customer-focused approach to improve the quality of an organization's processes, products and services. Despite the numerous attempts to incorporate TQM in organizations, relatively little is known about its effectiveness and optimal implementation strategies. Few systematic studies have been carried out to evaluate TQM empirically; also, little theory exists to guide TQM implementation. The overall purpose of the current article is to provide a better conceptual basis on which to incorporate TQM into organizations and to guide future research efforts. In doing so, a performance management system is described which is designed to be compatible with total quality implementation.

The Nature of TQM

While many people emphasize the importance of TQM, few can articulate precisely what it is and thus, how to implement it. A review of the literature reveals that TQM encompasses a vast spectrum of topics of approaches. For example, Deming (1986) approached quality from a statistical perspective, emphasizing the reduction of variance through statistical process control techniques. He also outlined 14 management principles which include management commitment, process design and control, reducing barriers to employee participation, and continuous improvement. Crosby (1979) focused on people and organizational factors, emphasizing cultural change, training, management commitment to quality, and the ongoing calculation of quality costs. Juran (1989) emphasized planning and product design, quality audits, and supplier/customer relations. Taguchi and Clausing (1990) extended the quality improvement activities to include product and process design. Taguchi and Clausing's methods provide a system to develop customer-based specifications and then design those specifications into a product and/or process.

Taken together, the above quality "gurus" seem to suggest the following elements to be key to the TQM concept.

- upper management commitment to place quality as a top priority;
- striving continually to improve employee capabilities and work processes;

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- involvement of all organizational members in co-operative, team-based efforts to achieve quality improvement efforts;
- a focus on quality throughout all phases of the design, production and delivery of a product/service, i.e., not just the end product;
- attempts to involve external suppliers and customers involved in TQM efforts;
- frequent use of scientific and problem-solving techniques, including statistical process control;
- the institution of leadership practices oriented towards TQM values and vision; and
- the development of a quality culture.

These elements are also congruent with the following definition of TQM taken from Sashkin and Kiser (1991, p. 25):

TQM means that the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services.

TQM Confusion and Research Needs

Despite the attention given to TQM in real-world organizations, relatively little academic research has addressed the topic. This is unfortunate given the need of organizations to understand the complex implementation issues surrounding TQM. Recently, Robinson *et al.* (1992) issued a plea to academics in production and operations management to pay more attention to TQM.

Given the lack of systematic research, it should not be surprising that anecdotal information is emerging in the popular press regarding TQM problems and confusion. For example, Fife (1992) described the "total quality muddle" caused by inadequate definitions and implementation questions. The end result is that companies become frustrated when TQM programmes fail to produce tangible results quickly. The firm of Ernst & Young in co-operation with the American Quality Foundation recently conducted a study to ascertain the TQM practices that work versus those that are less beneficial. However, their methodology and findings have not been clearly reported to the public, raising scepticism over the study's conclusions (Dean and Evans, 1994). Along similar lines, Garvin (1991) criticized the United States National Institute of Standards and Technology, which oversees the Malcolm Baldrige National Quality Award, for maintaining secrecy regarding data on assessed companies. Garvin suggested that the availability of such data would significantly facilitate the study of quality principles.

An advancement can be seen in the work of Waldman (1993) who recently attempted to provide some theoretical direction to the study of leadership and TQM. Indeed, others have been engaged in theory-building related to TQM (cf Bushe, 1988).

Thus although theory development is still at an early age, the time is ripe for systematic research to proceed so that empirical questions may be addressed regarding the successful implementation of TQM.

An additional advancement in TQM conceptual development and research was achieved by Saraph *et al.* (1989). These researchers attempted systematically to conceive and measure TQM-related factors, largely inclusive of the elements listed above. Their work resulted in the identification of eight separate factors (both organizational and operational in nature) of TQM. An instrument to assess these factors was developed. Saraph *et al.* proposed that these measures could be used independently or in combination to produce a profile of TQM practices in an organization. The eight factors include:

- (1) the role of management leadership and quality policy;
- (2) the role of the quality department;
- (3) quality-related training;
- (4) produce or service design;
- (5) supplier quality management;
- (6) (production) process management;
- (7) quality data and reporting; and
- (8) employee relations.

Some recent work has attempted to use these factors to predict customer perceptions of quality in service industries (Waldman, Motahari and Gopalakrishnan, 1993).

Deming (1993) recently proposed a “theory of profound knowledge”. A key aspect of this theory is that the success of quality management efforts depends on the effective integration of various management subsystems. As discussed in further detail below, the maximum effectiveness of TQM may hinge on whether performance management subsystems are consistent and integrated with continuous improvement subsystems.

Subsystem Integration

The importance of integrating various subsystems in organizations is not an especially new concept (cf Katz and Kahn, 1978). In this regard, a theoretical perspective particularly relevant to TQM implementation can be found in sociotechnical theory. The sociotechnical approach emphasizes the design of work systems in such a way that the social and technical aspects of those systems are integrated and supportive of one another. In the pursuit of effectiveness, one subsystem cannot be optimized at the expense of another.

Attempts to implement TQM have often emphasized continuous improvement and customer-based management without adequate consideration given to existing organizational cultures which may not be conducive to such efforts (Bushe, 1988; Garvin, 1986). Features of incompatible cultures include:

- pervasive values and norms oriented towards short-term production and quick fixes as opposed to systematic problem solving;
- segmentation of activities and the pursuit of departmental goals as opposed to unified efforts; and
- the hoarding of information for purposes of power-building as opposed to sharing information where it is needed to solve problems and empower individuals.

A position taken here is that performance management constitutes a related and important socio-subsystem which must be aligned with technical aspects of TQM subsystems. Performance management is defined broadly here as processes oriented towards co-ordinating and enhancing work activities and outcomes within an organizational unit. As such it includes both appraisal/feedback and reward systems. Work has begun to identify how such systems can be changed to be more compatible with TQM and the extent to which these new systems are preferred by organizational members (Waldman, 1993; Waldman and Kenett, 1990; Waldman, Ghali and Rancourt, 1993). The nature of performance management processes that are consistent with a TQM environment is described in detail below. An underlying proposition is that the implementation of such systems, *in combination* with processes such as continuous improvement, form a maximal strategy for organizations. I propose that a key reason why many TQM efforts do not come to fruition (in terms of extent or speed of implementation), or obtain disappointing results, is that performance management procedures do not change and, hence, become outdated.

TQM and Performance Management

Human resources management (HRM) theory and practice have for many years focused on individual differences in the management of performance in organizations. Indeed, areas such as selection, performance appraisal, and compensation have largely been concerned with decision making based on the assessment of individual differences. An underlying assumption has been that individuals matter in the determination of work performance variation. Proponents of TQM have recently questioned this focus, and instead have chosen to emphasize aspects of work systems as being predominantly relevant to work performance (Deming, 1986; 1993; Juran, 1989; Walton, 1986). Deming has taken a broad approach to defining work systems to include such elements as standardized processes, social influences (e.g. groups and leaders), and machinery or equipment. Moreover, Dobbins *et al.* (1991) noted how aspects of work systems can affect the individuals in that system equally (e.g. each person has available, and uses, the same machinery), or may have differential effects on different individuals (e.g. leadership practices: cf Graen and Scandura, 1987). The implications of a system-based perspective are enormous with regard to the theory, research, and practice of performance management.

A number of individuals associated with the TQM movement have been highly critical of Western performance management practices (Crosby, 1979; 1984; Deming, 1986; 1993; Juran, 1964; 1989). Among these, perhaps the one most

strident in his claims has been Deming. Deming (1986) summarized his management philosophy with 14 management principles which he offered as requirements to remain competitive in providing products and services. He also listed “deadly diseases” common in Western management practices. Two primary themes relevant to total quality and performance management are developed by Deming. The first theme is that the central problem of management is an incorrect understanding of variation in performance phenomena, including the work performance of employees.

Deming’s lamentation focuses on the confusion between common and special causes of variation. Special causes are sporadic in nature, and with regard to work performance, can include factors unique to the individual worker, i.e. separate from the system in which the individual operates. The sporadic nature of special causes is evident in Deming’s proposal that very little of the variance in work performance is due to such causes. In contrast, the lion’s share of variance is due to common causes which, according to Deming, are system-based. Furthermore, system-based causes of performances are the responsibility of management to correct. “No amount of care or skill in workmanship can overcome fundamental faults in the system” (Deming, 1986, p. 315). TQM proponents have been quick to criticize performance appraisal practices which are based on the assumption that the individual employee is largely in control of his or her own performance level (Deming, 1986; Scherkenbach, 1985; Scholtes, 1987; Walton, 1986).

Thus, Deming would claim that a mean performance level simply reflects a system’s overall capability. Variation on that performance level within plus or minus three standard deviations is system-based and random in nature. It follows that a second primary theme of total quality is that a process (or work performance in a unit) can only be improved by first identifying and eliminating the special causes of variation to achieve a stable process. Then the overall system can be improved by focusing attention on the common, system-based factors which affect performance. One of Deming’s main concerns is that management, through such mechanisms as performance appraisal, attempts to respond to most variation as if it were due to special causes rather than to common causes.

Individual-based Approaches to Performance Management

An individual-based focus has been the primary paradigm used by performance management researchers. This includes an emphasis on individual performance appraisal, goal setting, and feedback. Performance appraisal has been a subject of much interest to HRM researchers. Literally hundreds of articles have been written on the subject over the past few decades (cf Bernardin and Beatty, 1984; Bretz *et al.*, 1992). Most of this effort has been devoted to characteristics of instruments and raters, with underlying goals to eliminate errors of bias, better understand performance-related information processing, and ultimately to improve rating accuracy.

Research on performance management has included other individually-focused phenomena that may occur before, during, and after appraisal. These include

planning processes and interventions designed to maintain or improve performance. For example, individual feedback and goal setting have both received much acclaim as ways to manage task performance (Ashford and Cummings, 1983; Locke *et al.*, 1981). Characteristics including the specificity of feedback and the extent to which it includes both behaviours and outcomes, and the degree of goal difficulty have been especially associated with higher performance (Chhokar and Wallin, 1984; Kim, 1984; Locke *et al.*, 1981). The interconnectedness of goal setting and feedback has also been discussed. Tolchinsky and King (1980) and Bandura and Cervone (1986) proposed that the effect of feedback depends on the beliefs that such feedback generate and, specifically, on the goals that are set in response to feedback.

Problems with the Individual Approach

As noted by Dobbins *et al.* (1991), management approaches that include performance appraisal, feedback, and goal setting assume that the potential for greater performance stems from the individual. Furthermore, it is the object of performance management to find mechanisms to release this potential. Two assumptions are key to an individual approach:

- (1) with regard to performance appraisal, raters can accurately distinguish system from person causes of performance; and
- (2) enhancing individual task performance will enhance the performance of the greater unit or organization.

Measurement error theory is concerned with the accurate assessment of an individual performer. Key to this theory is the notion of true score (Guilford, 1954; Nunnally, 1978). In essence, an individual performer is conceived to have a hypothetical true score reflective of that person's performance as an individual. Error in obtaining that true score can be due to either systematic bias or random errors.

With regard to formal appraisal, the rater's task is accurately to identify performance due to the individual's own ability or motivation, as opposed to factors outside of the individual. This requires an absence of random errors such as those which might be caused by temporary mood fluctuations. It also requires an absence of systematic errors such as those due to racial or gender-based biases, or various types of inappropriate attributions (e.g. Heneman *et al.*, 1989; Waldman and Avolio, 1991). Moreover, factors in the work system which may affect performance, such as those described earlier, are considered as potential sources of error in the rating process.

A number of issues cloud the quest for true score accuracy in the appraisal process. In an appraisal context, the goal of accuracy requires that the rater be able to distinguish individual causes of performance from system causes. Appropriate attributions can then be made, thus leading to fair ratings and the allocation of rewards and punishments. However, Carson *et al.* (1991) and Deming (1986) recently argued that this is a difficult, if not impossible, task for raters. The difficulty increases as the rater is asked to make finer distinctions between levels of performance. Furthermore, even if it is psychometrically possible to

separate individual from system causes accurately (cf Kane and Kane, 1992), the politics associated with performance appraisal may inevitably lead to manipulations of ratings and rating systems by supervisors (Longenecker *et al.*, 1987).

A second problem associated with an individually-based approach to performance management is the assumption that by enhancing individual task performance, the performance of the greater unit or organization will subsequently be enhanced. TQM proponents have been critical of the use of such individualized goal-setting practices as management-by-objectives for at least two reasons. First, individuals may attempt to set or negotiate less challenging, easy goals to obtain rewards. Second, and perhaps more importantly from a TQM perspective, goals tend to be set stressing only short-term, financial or productivity outcomes. The problem is that because of self-interests, goals are pursued at the expense of the type of teamwork and continuous improvement efforts necessary to improve work systems and processes (Kerr, 1975; Scholtes, 1987; 1988). As noted by Deming (1986), traditional performance appraisal and associated reward mechanisms reward people who do well (or at least appear to do well) within the system. However, such procedures do little in an attempt to improve the system. These are potentially growing problems because of the increasing interrelatedness of individuals' work activities and the need on the part of organizations for continuous improvement to maintain competitiveness.

Leader-member exchange and associated role-making theories provide an interesting example of the possible problems caused by an over-reliance on individualized performance management (Dienesch and Liden, 1986; Graen and Scandura, 1987). Such theories suggest that, especially when an individualized performance management paradigm is predominant, people within a group will tend to form varied dyadic relationships with the group's leader. Some individuals will form in-group relations characterized by greater communications, commitment, and mutual support. Other dyadic relations will tend to be more in terms of an out-group characterized by a reliance on formal authority by the leader, little involvement in the job or team by out-group members, and little mutual support. Thus, the tendency is for both in-group and out-group relationships to develop, perpetuating what Deming (1986) would refer to as common cause performance variation. Unfortunately, teamwork, an important concept in the TQM literature, may be a casualty of in-group/out-group performance variation. People in an out-group may not work well or may form rivalries with in-group members, making teamwork extremely difficult to accomplish.

In sum, the individual-based approach to performance management appears to be largely unworkable and incompatible with TQM philosophies and activities. Attention is now turned to performance management strategies proposed to be more in line with TQM efforts.

A TQM-compatible Approach

Dobbins *et al.* (1991, p. 21) argued that "performance management activities would be much more fruitful if directed at system characteristics". Their reasoning was largely based on the problems discussed above and the degree of system

contribution to variance in work performance. A *system-oriented approach* would be primarily oriented towards improving processes which affect the performance of all individuals within the system. For example, in a production area, work-flow or other technological processes might be evaluated and then improved in such a way as to enhance the performance of an overall work unit.

Forms of performance management which attempt to link individual- and unit-level performance are consistent with a system-oriented approach and TQM philosophies. Such a linkage may be accomplished in two ways. First, in line with the work of TQM proponents (Deming, 1982; 1986; Juran 1964; 1989; Scholtes, 1988; Walton, 1986), performance management may focus on ways to evaluate and improve the work system. In essence, this involves an identification of the internal or external customers associated with a work unit and measures to determine the extent to which customers' needs are being met. Group-level involvement is attained so that co-workers and management work together to determine potential chronic problems which may be causing performance variance within the system and low levels of performance in relation to customer needs.

A second mechanism for linking individual- and unit-level performance is to focus performance management largely at the unit level in terms of appraisal and rewards. This would be in contrast to the more common existing practice of making fine distinctions among individuals when appraising and rewarding (Bernardin and Beatty, 1984; Bretz *et al.*, 1992). Individual efforts in organizations must increasingly be integrated in a total group effort and output. This idea lead Gabris *et al.* (1985) to conclude that the natural unit of analysis for appraisal in organizations should be the group rather than the individual. Although group-level assessment raises potential problems associated with social loafing (see George, 1992), Matsui *et al.* (1987) demonstrated how having group-level goals causes individuals to accept more difficult goals for themselves. Matsui *et al.* concluded that by having group goals, members develop a sense of shared responsibility for the attainment of their individual goals. Relatedly, Marks *et al.* (1986) showed how membership in quality circles could increase the commitment and productivity of individual members. Indeed Cartwright (1951, p. 387) had argued earlier that the group could be used as a "medium of change" to ensure the control of individual behaviour and performance.

Some laboratory evidence exists showing how group-based reward systems may be superior to individually-based systems. In a series of experiments, Deutsch (1985) found no evidence that people work more productively when rewards are tied directly to individual performance than they do when rewards are distributed equally within a group. Perhaps, more importantly, for tasks where success depended on individuals working together (i.e. task interdependence), Deutsch (1985) found a clear difference whereby a system of equal rewards was superior to individually competitive reward procedures. Earlier, Blau (1972) had conceived the negative conflicts which could result when systems compel individuals to compete for scarce rewards.

Case examples have begun to emerge of companies attempting to reduce sharply the extent to which fine distinctions are made among individuals with regard to

formal evaluations of their performance (cf Gellerman and Hodgson, 1988; Scherkenbach, 1985). For example, instead of rating people on common five- or seven-point scales, Gellerman and Hodgson described how American Cyanamid had resorted to a simplified, three-point method. Most individuals would be rated in the middle category most of the time. This corresponds to Deming's (1986) notion of the majority of individuals falling "within the system", while only a limited number should be considered as being "outside the system". However, it is unclear whether these companies are concomitantly instituting more group-level measures, or whether they have been successful with their efforts. Lawler (1990) described how it might be possible for an organization to design its appraisal system to include group measures. Case studies have been documented of public sector organizations attempting to implement group-level appraisal and reward systems (Gabris *et al.*, 1985; Gilbert and Nelson, 1989). Bullock and Lawler (1990) provided some encouraging evidence for the effectiveness of such systems.

Two perplexing issues surround the type of performance management system considered to be compatible with TQM as described above. First, an important issue is whether maximal effectiveness would be achieved when group-based appraisal and reward systems are *coupled* with the types of continuous improvement activities that have become associated with TQM. That is, when implemented alone, group-based appraisal and reward may have limited effects. Likewise, the sole implementation of a continuous improvement strategy may stagnate if not combined with group-based appraisal and reward. Organizational members might perceive inconsistencies if continuous improvement strategies emphasized cooperation and teamwork, while appraisal and reward systems only encouraged individual accomplishment – or even worse, competition. Such notions must remain speculation in the absence of research.

A second issue is whether system-oriented performance management may be most beneficial at lower hierarchical levels. Previously cited evidence and case examples have largely focused on lower-level employees (e.g. Bullock and Lawler, 1990). Since managers at higher levels are increasingly responsible for system creation and change (Katz and Kahn, 1978), it logically follows that individually-oriented evaluation and rewards may remain viable at higher levels.

Nathan *et al.* (1991) acknowledged that individual appraisal and reward procedures may only be appropriate under two conditions: when it is reasonable to assume that performance variation is due primarily to individual differences in ability and effort; and when the evaluation procedure does not force subjective judgements of employee-caused versus system-caused performance variation. These conditions may largely be met for upper-level managers. Evidence exists showing organization performance results are greater for companies that closely tie executive compensation to financial performance measures (Abowd, 1990; Leonard, 1990). However, as noted by Deming (1986), it may be best to orient such incentives towards the long term to ensure that the organization maintains constancy of purpose and continuous improvement efforts.

In sum, the above arguments suggest that performance management efforts focused on group-level appraisal and rewards will have a greater positive effect

on TQM implementation efforts than on efforts focusing on individuals, especially at lower hierarchical levels. In addition, these effects will be further maximized when coupled with a continuous improvement approach to work systems. Attention is now turned to the implications of such performance management strategies to an area of paramount importance to TQM effectiveness – customer relationships.

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Implications for Supplier-Customer Relationships

A system-oriented approach to performance management has implications for internal and external supplier-customer relationships (SCRs). Quality has been commonly defined in reference to SCRs in that quality is achieved when the supplier is able to meet the needs of customers (Brown, 1991; Juran, 1989). SCRs have been conceived in a broad manner to include chains of individuals or groups, both internal and external to an organization (Juran, 1989; Tenner and DeToro, 1992). System-oriented performance management concepts can be applied as a means of achieving an optimal SCR paradigm.

Traditional and system-based characterizations of SCRs are shown as Figure 1. Relationships between employees and managers are portrayed in Figure 1 as a type of internal SCR. Traditionally, this relationship has been viewed unidirectionally with employees attempting to serve needs as defined by management. Management, in turn, is responsible for ensuring that the needs and expectations of customers are met.

The roots of this traditional model can be traced to such authors as Weber (1947) who maintained that the formal status of employees is akin to that of a contractual relationship. In essence, the employee receives wages and other benefits in return for adhering to work rules and instructions regarding work processes as determined by management. More recently, the traditional paradigm has manifested itself in exchange models of leadership (e.g. House and Mitchell, 1974), as well as resource dependence models of pay allocation (e.g. Bartol and Martin, 1988). The gist of these models is that employees serve the legitimate needs and direction of management which, in return, uses various reward or resource allocation mechanisms to ensure appropriate behaviours. It is also

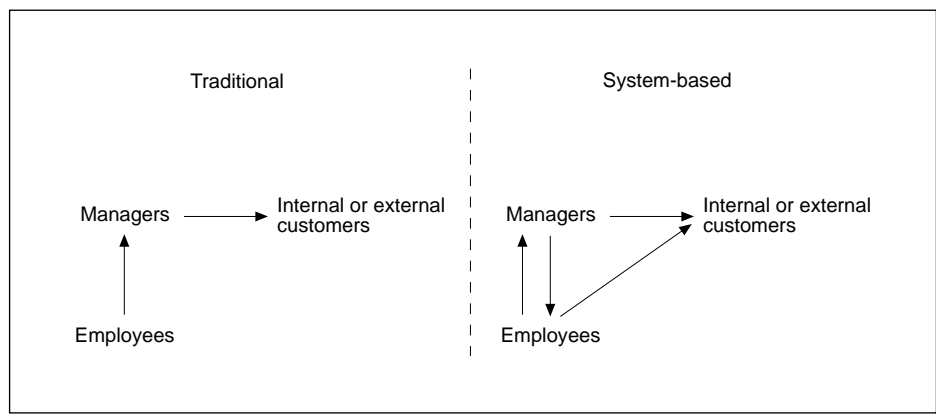


Figure 1.
Traditional and
System-based Supplier-
Customer Relationships

interesting to note how performance appraisal practices have tended to follow from the traditional SCR paradigm. Performance appraisal can be viewed historically as a control mechanism to ensure that employees are serving performance needs as defined and measured by management.

A substantially different paradigm is suggested by the system-oriented approach to performance management described earlier. The direction of the SCR becomes two-way whereby managers are also serving the needs of employees with regard to the facilitation of system improvement processes. This approach can be symbolized by the inverted pyramid concept gaining popularity in practitioner literature (cf Richards, 1991). The inverted pyramid places external customers at the top, followed by employees, and then management. Using the inverted pyramid concept, managers and employees work in collaboration to identify and measure internal or external customer needs. Managerial behaviour is oriented towards helping employees to analyse work processes, identify opportunities for improvement, and track improvement progress so that customer needs can be met (Zenger, 1991). Thus, the system-based SCR paradigm includes managers and employees together sharing responsibility for responding to customer needs.

Tenner and DeToro (1992) also noted the benefits of having lower-level employees more closely linked to customers. Moreover, the work of Manz and Sims (1987; 1989) appears to be in line with the inverted pyramid concept. Manz and Sims specifically considered the external leadership of self-management teams whereby the role of the leader is to make people to control their own behaviour as they serve the needs of customers and clients.

It is interesting to compare the traditional and system-based conceptualizations of SCRs depicted in Figure 1 with Juran's (1989, p. 237) consideration of SCR trends. Juran noted an historic pattern of SCRs being conducted in an adversarial mode with little collaboration between supplier and customer. In essence, the relationship was one based solely on exchange or economic values. In contrast, Juran (1989) and Dean and Evans (1994) recognized more recent trends towards a teamwork approach characterized by mutual collaboration and assistance.

Conclusion

This article has attempted to provide direction to total quality conceptualizations of work performance and its management. Various literatures, including writings in TQM, have been integrated in an attempt to show the necessity and implications of system-oriented performance management with regard to total quality implementation. The approach espoused here may be especially opportune given the strong criticisms which have recently been placed on traditional appraisal and performance management processes by TQM proponents. For example, Deming (1986) identified performance appraisal as one of the "deadly diseases" afflicting American management. Perhaps greater theoretical and empirical attention to system factors would help human resources researchers find ways to make appraisal less "deadly". In doing so, appraisal and performance management research in general might become more applicable in terms of helping managers and employees to deal with performance issues facing their organizations.

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