The ABCs of Customer-Centered Performance Measures

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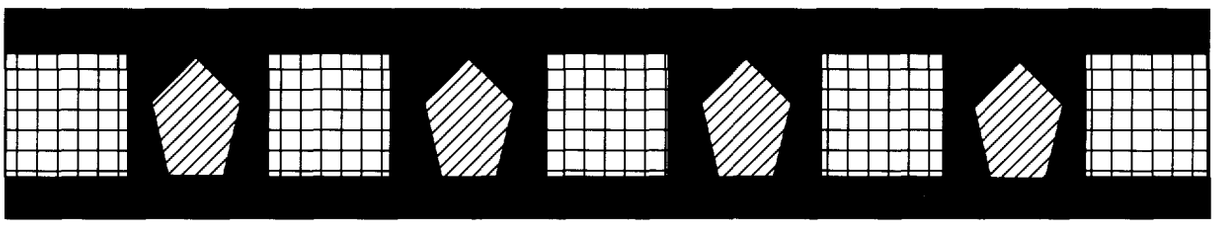

Recent Changes in Performance Measurement

Cost accounting was developed in the late 1800s to help managers evaluate the total costs of operating textile mills, railroads, steel mills, retail stores, and other businesses. These systems also provided management with the unit production costs. Attention was focused on variable costs (such as labor and materials) versus fixed costs (maintenance, facilities, and support functions). At that time, variable costs formed a considerable portion of total costs, perhaps 80% or more. Consequently, gathering the relatively small amount of fixed costs into a pool and assigning a portion of the costs to products on some rational basis was a sensible approach. Back then, this technique provided a reasonable approximation of the unit cost of production when the volume was high and the number of different products was small.[1]

Unfortunately, management began to evaluate the performance of the firm almost exclusively from financial indicators emanating from the cost accounting system. From a cost standpoint, this meant thinking about the relationship between costs and efficiencies in ways that are inherently flawed because of the nature of the cost accounting system (Schmenner, 1992). To assess overall performance, management and stockholders frequently focused on profitability ratios such as return on equity and return on assets. In addition, activity measures such as machinery utilization, labor utilization, asset turnover and inventory turnover were used to evaluate internal management performance.

Relying exclusively on such indicators to evaluate overall performance has two significant problems. First, the systems were developed to measure the costs of production, not the financial performance of the firm. Thus, the use (or misuse) of such indicators resulted in performance evaluation systems that reward decisions that improve short-term performance but typically ignore other important criteria such as customer service. A second major problem arises when the data used to construct the measures are inherently flawed, thus providing inaccurate information. This can be the case when overhead is allocated equally across products that differ significantly in production volumes.

The cost accounting methods that were adequate for a single-product, high-variable cost firm are no longer appropriate for a multi-product, high-fixed cost firm. Production methods have changed dramatically, particularly in the past two decades, and the assumptions on which many of the cost accounting techniques were based are no longer valid. In many firms today, fixed costs make up 85% to 92% of the total, and they must be allocated somehow to specific products. Previously, such straightforward measures as direct-labor hours, total-machine hours and even total value of the product could be used to allocate those costs. As production methods have become more capital intensive, and variable costs have become a smaller proportion of total costs,

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using variable costs as a basis to allocate fixed costs becomes extremely problematic, since there may be no relationship between them. The cost of producing an item may be significantly overstated or understated. Erroneous data is then fed into the cost accounting system that becomes the basis for overall performance evaluation. As a result, traditional cost-accounting-based measures not only fail to provide useful feedback, but also encourage counterproductive behavior, as will be demonstrated later.

To effectively compete in today's marketplace, firms must radically alter their notions of performance measurement. Accounting systems must be redesigned to capture relevant costs of production. Moreover, broader performance measures that focus on the customer must also be developed. Activity-based costing (ABC) has been the accounting profession's response to the altered production processes, but ABC does not address the problem of extensive reliance on accounting-based performance measures for overall performance. Recently, ABC has been expanded to an "activity-based management concept," which broadens performance measurement beyond the traditional financial indicators (Keegan and Eiler, 1994). It is imperative that the shift to the ABC framework be accompanied by a change in how firms approach the entire issue of performance measurement.

Performance measures used by world-class organizations tend to be customer- rather than management-centered.[2] Customer-centered performance measures are linked with product quality, dependability of service, waste reduction, timeliness, flexibility, innovation, and other indicators tied to actual work processes. Implementation of these measures has often resulted in marked improvements in internal work effectiveness and in the performance of products and services in the marketplace. Conversely, management-centered performance measures tend to focus on short-term profits, cost trade-offs, transaction-driven management, and functional department silos. This often results in a company-centered, internal management orientation, failure to understand what the customer really wants, and the sacrifice of long-term performance for short-term gains.

The difference in orientation and actions of organizations that are manager-centered versus customer-centered is so great that they have been labeled as separate operational paradigms. A variety of familiar programs fall into the customer-centered paradigm, including total quality management (TQM), just-in-time (JIT) manufacturing, total productive maintenance (TPM), quality function deployment (QFD), continuous improvement, and total employee involvement. Numerous arguments have been advanced as to why customer-centered organizations outperform manager-centered ones in such areas as innovation, quality, timeliness, cost, and customer satisfaction.[3] As will be discussed in the next section, cost-accounting-based performance measures make it difficult for manager-oriented organizations to keep the overall mission in mind, avoid succumbing to strong pressures, and to behave in ways that hurt overall performance.

Dysfunctional Effects of Cost-Accounting Performance Measures

Once implemented, performance measures tend to take on life of their own, motivating specific behaviors. As the saying goes, "you get what you measure." Inappropriate use of cost accounting may begin to drive organizational actions and strategies because it tells employees what is important and how their performance will be evaluated. Consequently, these performance measures become powerful motivators of behavior, and organization members lose sight of the organization's goals. The goals become disconnected from actions and no longer serve as a driving and stabilizing force.

Once cost accounting measures are in place, organizational members in each department are motivated to maximize output, minimize unit cost, and maximize performance based on measures such as machine- and labor-utilization. These efforts are pursued without consideration for ultimate consumer demand and may result in excessive amounts of work-in-process (WIP) and inventory. To help maximize machinery utilization and direct-labor utilization, long production runs are sustained and workers are kept as busy as possible. These efforts not only add to WIP and inventory problems, but also result in inadequate attention to quality.

While this is a hypothetical example, it closely parallels the situation described by Baker, Fry, and Karwan at the Brice Plant of Knussmann Corporation. In this case, management realized the error of its ways in relying on traditional cost accounting measures and tried to change its system. It set goals of increasing

work-in-process inventory turnover from 10 to 52 per year and reducing scrap rates from 4.5% to 0.5% of cost of goods sold. Even though direct labor was only 8% of product costs, management was so conditioned to focus on traditional cost measures that direct-labor costs drove their decision-making processes, even though goals were set in terms of what should have been more appropriate performance measures. The final result, not surprisingly, was no change in WIP turnover or scrap rates because operational decisions were made on the basis of direct-labor hours. The authors conclude, "Thus, reliance on a traditional, yet improper, set of performance measures not only hinders the implementation of time-based or quality-based manufacturing but actually may halt it." (Baker, Fry and Karwan, 1994, p. 57) In this case, simply changing objectives was not sufficient. What was needed was a major modification of the cost accounting system, along with more appropriate tools such as activity-based costing and JIT.

Advantages of Customer-Centered Measures

A key element of customer-centered performance measures is the concept of a "chain of customers" within the organization.[4] If a production process involves a sequence of steps by different work groups then, in effect, a series of supplier-customer relationships results. Ideally, the initial supplier will provide the materials needed by its customer only in the quantity needed and only at the time they are needed. Performance-measurement data collected from the customer group might include timeliness, quality, cycle time, defect rate, and perceived customer-service orientation of the supplier. The supplier group might also collect its own data on scrap rates, customer complaints, quality, and related variables. These data must be continually scrutinized, and indications of any problems should immediately lead to corrective actions.

As the customer becomes, in turn, the supplier for the next link in the chain, exactly the same process of performance measurement and feedback of data would be used. The end result of the chain of customers is essentially a "horizontal organization," in which the products flow smoothly unimpeded by departmental boundaries.[5] The importance of performance information in a horizontal organization cannot be over-emphasized. While manager-centered organizations focus on vertical information flows, the lateral or horizontal flows of information created by customer-based performance measures are critical to improving and sustaining effective performance.

At this point it may be helpful to compare a management-centered performance measure with a customer-centered one to illustrate the significance of the shift from accounting-based performance measures to customer-based measures. Traditional accounting-based accounting measures of quality might include (1) the cost of rework as a percentage of the cost of goods shipped, and (2) the cost of scrap as a percentage of cost of goods manufactured. While both ratios are important to management in attempting to control costs, neither is significant to the customer, who simply wants reliable, defect-free merchandise. In fact, the ratios are only surrogate measures of quality. Also, because they are derived from the cost accounting system, they are susceptible to the limitations arising from cost allocations.

Assume Mercer, Inc. manufactures a sophisticated electronic device that is a component in medical imaging equipment. The unit cost is $5,000, which consists of labor, materials, and overhead, allocated at the rate of $5 per labor dollar. Mercer sold and delivered two thousand units during a period, resulting in a cost of goods shipped of $10,000,000. It subsequently repaired 200 of the units at an average cost of $100 per unit. By traditional cost accounting measures, it has a minuscule rework percentage of .002 ($20,000/$10,000,000), which implies a high-quality product. On the other hand, customers are complaining about the quality of the products, since 5% of them are defective and must be returned. A more appropriate measure of quality would be simply the units returned as a percentage of the units shipped.

Assume that Mercer's management responds to the customer complaints by increasing the rate of inspections. The inspections raise labor costs by $100,000 and decrease the number of units to be reworked by only a single unit. The cost of the units shipped will be increased by $600,000 ($100,000 labor and $500,000 of applied overhead) while the cost of rework drops by $100. According to the accounting based measure, the rework rate now drops a respectable 6% from .002 to .00188, ($19,900/$10,600,000). However, the quality of ship-

ments to customers is essentially unchanged.

A Conceptual Model For Developing Customer-Based Performance Measures

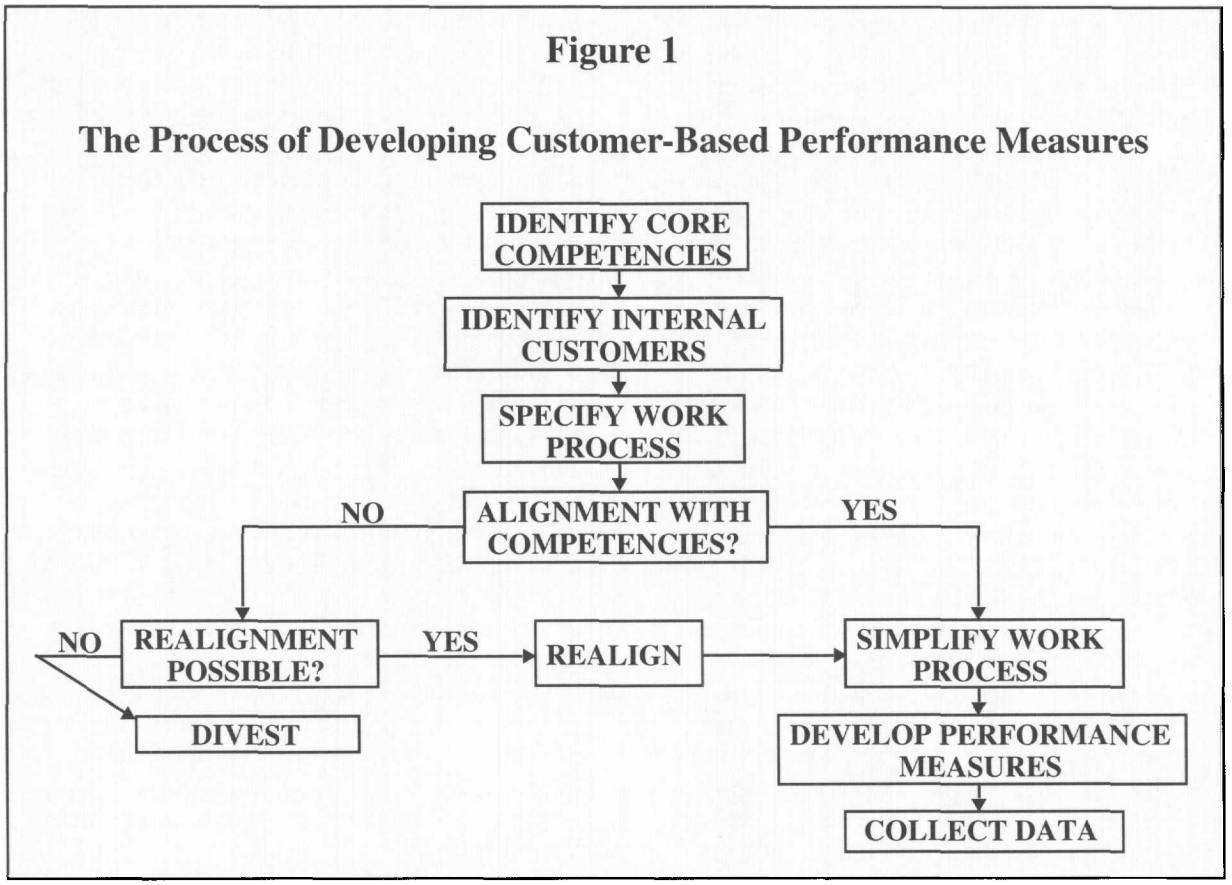
To this point, we have raised a number of critical conceptual issues with little in the way of specific guidance regarding the process of developing customer-based performance measures. The model shown in Figure 1 provides a comprehensive, prescriptive framework for performance measure development. The model has been derived from key concepts in the quality, accounting, and manufacturing areas. It provides managers with a logical, step-by-step process to aid in the development of customer-based performance measures.

The first step in the model is identifying core competencies within the firm. The concept of core competency is based on the notion of competitive advantage developed by Michael Porter and expanded by C. K. Prahalad and Gary Hamel, who suggested that it derives from the consolidation of corporate-wide technologies and production skills into distinct competencies that allow rapid adaptation to changing opportunities[6]. These core competencies are attributes and abilities unique to a firm that allow it to do some things better than its competitors. Core competencies are important because they support the penetration of existing and new markets, play a significant role in adding value and benefits to the product as seen by the customer, and can be difficult for competitors to imitate.

The next step in this model highlights the importance of identifying internal customers. A major challenge here is making organization members understand that their customer may be in the next office. Firms must identify an internal chain of customers so that relevant, valid performance measures can be developed. Customer identification can be aided by notion of output. Arthur Tenner and Irving DeToro suggest that outputs can be defined as "the specific products or services that you produce, as part of your work process, and that you pass to others, who, in turn, use them in their work process"[7] They go on to state the obvious but important point that identifying who receives your output enables you to ask that person about such things as their requirements and expectations that can then be translated into

Figure 1

The Process of Developing Customer-Based Performance Measures



performance criteria (i.e., timeliness, quality, defect rate, and so forth).

Specifying work processes to map out process flows is a logical next step. Blaxill and Hout contend, "Everything flows from robust processes: higher quality, better cycle time and much lower overhead."[8] Process flows highlight the overall transformation process from inputs to outputs and help pinpoint critical links, bottlenecks, and potential trouble spots. When used in conjunction with the internal customer chain, an accurate process flow provides a very useful vehicle for identifying customer needs. This step builds on Schonberger's notion of organizing ". . . resources into chains of customers, each chain mostly self-contained and focused on a product or customer 'family'."[9] Therefore, customer needs become a driving force in the overall process of developing performance measures, whether the customers are internal or external.

At this point, we recommend an "alignment check." That is, an attempt must be made to link each work process with one or more core competencies. If such a link can be made in all cases, then it is appropriate to move to the stage labeled "simplify process," which forms the continuous improvement phase. For those work processes where no clear link can be found, an effort must be made to see if the processes can be modified or redirected to establish such a link. If this is feasible, then the work processes should be redefined in terms of core competencies. For processes that cannot be legitimately linked with a core competency, the process falls outside the strategic scope of the organization and may be a candidate for divestiture or termination. Such a decision, while potentially painful, is one that U.S. firms will continue to encounter. Management guru Peter Drucker has said that "Organizations increasingly will have to plan abandonment rather than try to prolong the life of a successful product, policy or practice — something that only a few large Japanese companies have faced up to."[10]

The step in the model labeled "simplify processes" signals the initiation of continuous work-process improvement. Process simplification in the early stages of implementing this model may have to start with organizational restructuring. Zammuto and O'Connor emphasize that use of an adaptive structure is crucial to obtaining any purported flexibility benefits from utilizing advanced manufacturing technologies. Based on J. F. Krafcik's study, they go on to note: "The factor that most influenced productivity was the organization of work. Plants having lean production systems — those in which the workers had broadly defined jobs that emphasized quality and teamwork coupled with just-in-time manufacturing practices — were more productive than those with more traditional, hierarchical, mechanistic structures featuring highly specialized production jobs and large inventories."[11] For example, statistical quality control (SQC) can be the basis for implementing a "Deming cycle," or something similar, to align information with accountability. Other advanced techniques for improvement can be adopted including just-in-time inventory control, statistical process control, and vendor quality control to name but a few (Roth and Miller, 1992). Specific improvements may include reducing distance, flow time and space along the customer chain, cutting set-up and start-up times, and using the customer's rate of usage for production scheduling as ways to streamline operations. Regardless of the techniques employed, it is critical that the improvements be initiated and driven by the organizational members and work teams most closely involved with the work processes.

Following the simplification of work processes, management must turn its attention to the development of performance measures. These measures will be of two types: cost accounting and customer-centered. In all likelihood, the former will already exist (unless it is a new firm), but the latter will have to be created. In any event, management must also determine whether the cost accounting system needs to be redesigned.

Robin Cooper has identified two methods of evaluating the need for redesigning a cost system. One way is to analyze organizational and environmental changes that have occurred since the system was installed to determine whether the system was capturing and reporting relevant information. The second is to learn to evaluate the signals sent by the system to top management to confirm their validity and the accuracy of the cost data.

In analyzing the organizational changes and environment, Cooper suggests that a redesign may be warranted when one or more of the following situations exist. First, the firm has increased automation in its production process. Such a shift normally means a decrease in

direct-labor costs and, therefore, an increase in the allocation of fixed costs. If fixed costs were previously allocated using direct labor, then the change in the production system has probably rendered this method obsolete. Second, the support functions may have changed. Therefore, costs associated with design, purchasing, storage, and quality control may not be adequately captured and allocated by traditional cost accounting methods. Third, the firm may have changed its product marketing strategy. If the company has shifted to offering more specialized products, or if it now makes a variety of products in varying production volumes, a change to an ABC system will probably result in more reliable and accurate information. Finally, the firm may face more intense competition. This usually manifests itself in price competition and attempts to better serve the customer, both of which may force a company to closely monitor its costs. A cost system that was adequate in an environment characterized by low competition and generous margins may not be appropriate in an intense environment where product price is foremost on the mind of the consumer. In some instances, it may not even make sense to continue to offer a product if the cost information suggests that the firm simply cannot compete.[12]

If, after reviewing its environment and production processes, a firm finds that it does need to redesign its cost system, activity-based costing may offer significant improvements over the existing system. A survey of Canadian firms that have either adopted or were considering ABC reported that 61% were attracted to ABC because of better cost data for pricing, and 43% claim improved performance.[13] It is important to note that ABC is not an alternative to the more traditional cost accounting process but is simply a refinement of that process. ABC is a methodology that focuses on the activities involved in producing a good or service. In the traditional systems, indirect costs (i.e., nonvariable) were simply aggregated and allocated using a single allocation base, such as direct-labor hours. In ABC, however, costs are assigned to products using causal relationships between units produced and production or service activities required. In other words, ABC attempts to account for as many direct costs as possible. The cost analyst identifies the major activities of a process and determines the resources required to perform the activity that results in an output. Thus, ABC uses multiple activity bases for cost allocation rather than a single base, which means that indirect costs decrease and direct costs increase after the implementation of an ABC system. For example, purchasing costs may have previously been part of factory overhead and allocated to productive activities based upon direct-labor hours. In an ABC system, the costs associated with the purchasing department would no longer be a part of overhead. Instead, the costs of the purchasing department would be aggregated, and a cost per purchase order, or cost per minute of processing time, would be identified. Then, whenever a purchase order was processed, the cost of the items on the purchase order would be increased by the cost of processing the purchase order. The result is a more accurate and valid measure of per unit cost.

Situations like these may suggest that a firm shift from a manager-centered, traditional cost accounting system to a customer-centered, ABC system to compete more effectively. Moreover, performance measures developed at one time may no longer be useful given changes due to continuous improvement or changes in customer needs. Particularly during the early stages of implementing customer-centered performance measures, moving away from the less specific overhead allocation to the more precise ABC indicators may be a major challenge.[14] Subsequent iterations should only require modifying existing measures to reflect changing processes and customer needs.

The final part of the model entails collecting, analyzing, and interpreting performance data. This may involve graphically tracking measures over time to assess improvement or setting up visual control systems to communicate the measures to everyone in the workplace. Here, the use of the "balanced scorecard" technique developed by Kaplan and Norton (1992) may prove helpful. In essence, this conceptual tool is a straightforward way of combining complex information from many sources into one comprehensive framework. It uses performance measures from four perspectives — financial, customer, internal, and innovation/learning — and presents them in one report. The financial data can be gleaned from the cost accounting system discussed previously. The other three perspectives are more precise categories of what we have discussed in this paper under the broad umbrella of customer-centered performance

measures. In fact, a number of firms such as Apple Computer and Rockwater have successfully implemented the balanced scorecard for performance evaluation (see Kaplan and Norton, 1993, for a detailed discussion). In any event, once the data have been collected and the analyses completed, it is critical to link the results to the core competencies and start the entire cycle anew.

Conclusion

The customer-centered paradigm provides an approach to the measurement of organizational performance that, unlike the management-centered paradigm, will improve organizational effectiveness. Customer-centered measures provide a powerful motivation to organizational members to improve quality, reduce cycle time, develop innovations, and generally improve the value-added by each work group. When performance measures are developed for each link in the internal customer chain, the organization effectively becomes horizontal rather than vertical.

Customer-centered measures provide the information that top management needs to make decisions. Experts in the area of production and productivity strongly advise managers *not* to make decisions based on traditional cost accounting data. This is not to say that there is no role for cost accounting measures or for measures associated with activity-based accounting. Cost accounting measures may be required for external reporting purposes, perhaps to regulatory agencies, or to fulfill legal requirements. Activity-based accounting methods may be useful for strategic decisions such as whether or not to pursue the production of a certain product or service.

We hope that the model presented here can be used to guide future improvements in all types of organizations, while noting the following caveats. Firms shifting away from management-centered to customer-based performance measures will be changing the fundamental way they do business. Changing performance measures is but one part of a much larger process involving changes in structure and culture, defining quality, staffing top-management positions, and thinking of overhead in terms of process, not costs. In any event, firms stepping up to this challenge must have high tolerances for ambiguity and frustration, especially in the early stages of implementation. Moreover, they must not expect overwhelming results early on. Depending on the type of changes being made, for example in the area of increasing quality, the results in terms of financial performance may lag implementation by a year or more (Reed, Lemak, and Montgomery, in press). Changes of such magnitude are long, painful and frustrating, but they are the harbingers of future success.

Dr. Lemak focuses his research on strategy formulation, TQM, organization structure, and international business; Dr. Austin, who teaches accounting, is also a CPA; Dr. Montgomery's research interests include TQM and organizational change and performance measures; and Dr. Reed concentrates on business level strategy issues, particularly in competencies, competitive advantage, and TQM.

REFERENCES

Baker, W. M. Fry, T. F., & Karwan, K. 1994. "The Rise and Fall of Time-Based Manufacturing." *Management Accounting*, (June): 56–59.

Blaxill, M. F., & Hout, T. M. 1991. "The Fallacy of the Overhead Quick Fix." *Harvard Business Review*, 69(4): 93–101.

Cooper, R. 1989. "You Need a New Cost System When. . ." *Harvard Business Review*, (Jan–Feb): 77–82.

Dixon, J. R., Nanni, A. J., & Vollmann, T. E. 1990. *The New Performance Challenge: Measuring Operations for World-Class Competition.* Homewood, IL: Richard Irwin.

Drucker, P. F. 1992. "The New Society of Organizations." *Harvard Business Review*, 70(3): 95–104.

Drucker, P. F. 1990. "The Emerging Theory of Manufacturing." *Harvard Business Review*, 68(3): 94–102.

Horngren, C. T., Foster, G. & Datar, S. M. 1994. *Cost Accounting: A Managerial Emphasis.* Englewood Cliffs, NJ: Prentice Hall.

Hall, R. W., Johnson, H. T., Thomas, P., & Turney, B. B. 1991. *Measuring Up: Charting Pathways to Manufacturing Excellence.* Homewood, IL: Richard Irwin.

Johnson, H. T., & Kaplan, R. S. 1987. *Relevance Lost: The Rise and Fall of Cost Accounting.* Boston: Harvard Business School Press.

Kaplan, R. S. & Norton, D. P. 1992. "The Balanced Scorecard-Measures That Drive Performance." *Harvard Business Review*, (Jan–Feb): 71–79.

Kaplan, R.S. & Norton, D. P. 1993. "Putting the Balanced Scorecard to Work." *Harvard Business Review*, (Sept–Oct): 134–147.

Keegan, D. P., & Eiler, R. G. 1994. "Let's Reengineer Cost Accounting." *Management Accounting*, (August): 26–31.

Krafcik, J. F. 1988. "Triumph of the Lean Production System." *Sloan Management Review*, 30(1): 41–52.

Ostroff, F. & Smith, D. 1992. "The Horizontal Organization." *The McKinsey Quarterly*, (1): 148–168.

Prahalad, C. K., & Hamel, G. 1990. "The Core Competence

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of any physical-dimension gap between existing skills and tools; and (2) in terms of people and task to determine the extent of any psychological-dimension gap between existing motivation and structure. Effective leaders intervene to bridge any gaps, thus serving as critical links in work accomplishment. And by providing optimal "gap-filling" leadership, managers free both themselves and their employees to develop their talents and their visions of their organization.

Dr. Sleeth, who teaches leadership and motivation, previously managed major programs in cost reduction and quality at Polaroid Corporation; Dr. Johnston, who designs and conducts management programs, focuses his research and writing interests in organizational theory and organizational behavior.

REFERENCES

1. We recommend augmenting the following discussion of original models with recent discussions found in two excellent texts: (1) Gary A. Yukl, *Leadership in Organizations,* 3rd ed. Englewood Cliffs, N.J.: Prentice-Hall, 1994, and (2) John R. Schermerhorn, Jr., James G. Hunt, Richard N. Osborn, *Managing Organizational Behavior,* 5th ed. New York: John Wiley & Sons, 1994).

2. J. K. Hemphill and A. E. Coons, "Development of the Leader Behavior Description Questionnaire," in R. M. Stogdill and A. E. Coons, *Leader Behavior: Its Description and Measurement* (Columbus, OH: Bureau of Business Research, Ohio State University, 1957).

3. D. G. Bowers and S. E. Seashore, "Predicting Organizational Effectiveness with a Four-Factor Theory of Leadership, *Administrative Science Quarterly* (September 1966): 238–263, and G. Yukl, *Leadership in Organizations* (Englewood Cliffs, NJ: Prentice-Hall, 1981).

4. R. Likert, *The Human Organization.* (New York, NY: McGraw-Hill, 1967).

5. R.R. Blake and J. S. Mouton, *The Managerial Grid,* (Houston, TX: Gulf, 1964).

6. R. Tannenbaum and W. H. Schmidt, "How to Choose a Leadership Pattern," *Harvard Business Review* (March–April 1958): 95–102.

7. F. Fiedler, *A Theory of Leadership Effectiveness* (New York, NY: McGraw-Hill, 1967) and F. Fiedler; M. M. Chemers; L. Mahar, *Improving Leadership Effectiveness: The Leader Match Concept* (New York, NY: John Wiley & Sons, 1976).

8. P. Hersey and K. H. Blanchard, *Management of Organizational Behavior: Utilizing Human Resources,* 4th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1982).

9. We prefer and have long used the term readiness. See E. H. Hunt and R. G. Sleeth, "Sharing Leadership Influence: A Life-Cycle Model," *The Dental Clinics of North America* vol. 21 (1977): 479–488. Hersey and Blanchard have adopted this term for their model.

10. For example, V. Vroom, *Work and Motivation* (New York, NY: John Wiley, 1964).

11. M. Blumberg and C. D. Pringle, "The Missing Opportunity in Organizational Research: Some implications for a theory of Work Performance," *Academy of Management Review* Vol. 7 (No. 4 1982): 560–569.

12. *ibid.,* p. 562.

(continued from page 10)

of the Corporation." *Harvard Business Review,* 68(3): 79–93.

Porter, M. E. 1980. *Competitive Strategy: Techniques for Analyzing Industries and Competitors.* New York: The Free Press.

Reed, R., Lemak, D. J. & Montgomery, J. C. (in press). "Beyond Process: TQM Content and Firm Performance." *Academy of Management Review.*

Roth, A. V. & Miller, J. G. 1992. "Success Factors in Manufacturing, *Business Horizons,* (July–August): 73–81.

Schmenner, R. W. 1992. "So, You Want to Lower Costs?," *Business Horizons,* (July–August): 24–28.

Schonberger, R. J. 1990. *Building a Chain of Customers.* New York: The Free Press.

Schonberger, R. J. 1992. "Is Strategy Strategic? Impact of Total Quality Management on Strategy." *Academy of Management Executive,* 6(3): 80–87.

Suzaki, K. 1987. *The New Manufacturing Challenge: Techniques for Continuous Improvement.* New York: The Free Press.

Tenner, A. R., & DeToro, I. J. 1992. *Total Quality Management: Three Steps to Continuous Improvement.* Reading, MA: Addison-Wesley Publishing Co.

Young, S. M. 1992. "A Framework for Successful Adoption and Performance of Japanese Manufacturing Practices in the United States." *Academy of Management Review,* 17(4): 677–700.

Zammuto, R. F. & O'Connor, E. J. 1992. "Gaining Advanced Manufacturing Technologies' Benefits: The Roles of Organization Design and Culture." *Academy of Management Review,* 17(4): 701–728.