A NEW LOOK TO PERFORMANCE MEASUREMENT SYSTEMS: GLOBAL ENLIGHTENED MEASURES

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Abstract

There is truth in saying that what gets measured gets done since criteria used for evaluation are the criteria people use to make decisions and do work. Therefore, regardless of any new philosophy, people revert to doing things old way if they continue to be measured in terms of old standards. Organizations trying to adopt JIT/TQM philosophy of continuous improvement will therefore fail unless they adopt decision criteria and performance measures consistent with that philosophy. This paper discusses the new role of performance measurement in business world and presents global enlightened measures which cover the new world-view of business.

A. INTRODUCTION

Measurement processes of a firm are very important to its overall performance. Measurement systems, when well designed, can provide a supporting mechanism that will help organizations attain their strategic goals. Furthermore, a firm’s performance measurement system serves as a crucial communication function, telling employees what is expected of them (APICS Participant Guide, 2001) and identifies how successfully an organization is progressing toward its near and medium range targets.

More than just a passive means for assessing what has already happened, the act of measurement serves to motivate particular behaviors and hence, predestine future outcomes. In modern times, accounting systems have become primary means by which organizations track and assess performance. Many of the assumptions upon which these systems are based are no longer valid, and the system represents an outdated worldview of business (Nicholas, 2000). This paper discusses the counterproductive influence of traditional systems and performance criteria on long-term performance.
organizational competitiveness. It also covers the new world view of business, global criteria measures and presents features of performance measurement systems for implementing these global measures.

B. CRITERIA MEASURES AND BUSINESS DECISIONS

The following example may display the main problem encountered in business world. Assume that there is a company that is testing ways to reduce waste by producing solely to demand and in small batches and changing layouts to reduce material handling costs. Assume also that there are many positive results, including decreased inventories and greater plant flexibility as a result of these new policies. The problem is the company’s cost accounting system, which measured results solely in terms of their effects on standardized financial criteria. It shows only bad results such as increases in indirect labor ratios, nonproductive labor time, and decreases in overhead absorption. Since the system has no way of accounting for improvements, the experiment is considered a failure and is canceled.

Perhaps obvious is that one’s decisions about courses of action should be based upon criteria compatible with one’s objectives, and that outcomes for those actions should be assessed using the same criteria. Nonetheless, an astonishing number of organizations rely upon decision criteria and measurement systems that are incompatible with their stated objectives. Today, virtually, many companies utilize standard cost-accounting systems for measuring and reporting performance, but these systems, from an operations perspective, rely upon criteria that are outdated and worth little in gauging important areas of organizational performance (White and Leon, 1999). Worse, the criteria used give a distorted view of performance and discourage attempts to reduce waste, continuously improve, or otherwise heighten competitiveness. Guided by traditional criteria, managers make decisions that look beneficial but in actuality are worthless or detrimental to the organization’s immediate well-being and long-term viability. The following section describes the limitations of traditional measurement criteria when used in continuous improvement and waste reduction efforts.

C. TRADITIONAL PERFORMANCE CRITERIA

Most criteria used today in performance-monitoring systems were developed in the early 1900s (Balou, 1999). The purpose of these criteria and systems was to provide a standardized means of reporting performance
to external groups such as shareholders. Businesses maintain gross financial statistics such as net sales, cost of sales, fixed assets, liabilities, and so on for periodic reporting in places such as the profit-and-loss statement and the balance sheet. At one time, numbers like these could be relied upon to give a somewhat credible assessment of the health of a business, and could be used for making decisions that would improve competitive standing.

In a market where competition is low and brand loyalty is high, a company can increase its income by slightly raising prices or lowering the cost of sales, and such things are reflected on financial statements. Today’s business world is not so simple. Financial statements tell only part of the story, and numbers can easily be manipulated to make poor performance look good on the books. Decisions that optimize costs and stock prices will not guarantee that a company will thrive or even survive unless they are weighed against other, non-cost criteria. Competitive advantage today translates into doing well in terms of product availability, variety, quality, and customer service, none of which are adequately addressed by simple cost-cutting measures or actions strictly geared to increasing profits.

Traditional performance criteria often convey an image more contrived than real. The usual way for computing product cost is to add the direct cost of labor and materials to a percentage of the overhead cost. The overhead cost allocation is usually based on a percentage of the direct labor hours. Decades ago this procedure made sense because most of the cost of a product came from the direct labor involved and most of the remainder came from materials (Nicholas, 1999). Given the importance of direct costs, companies established standards for labor rates and materials to help control these costs. Managers saw their primary goal as trying to achieve these standards. Seldom did they question the soundness of the standards themselves or the wisdom of utilizing such criteria over the long run.

Today the cost picture in manufacturing has changed dramatically (Wisner and Fawcett, 2000). Most of a product no longer comes from direct labor, but from overhead. Direct labor contributes only a fraction to cost, yet managers still pay plenty of attention to it because of the attached overhead cost allocation. While managers strive to improve their individual departments, products or processes in terms of costs and rate standards, no one pays attention to the combined effects on the overall organization (Vollmann, 2000)

Followings are traditional criteria commonly used for making decisions and measuring performance, and what is wrong with them from the perspective of continuous improvement and competitive advantage.
1. Standards and Variances

Every kind of input has a normative standard to which it is compared. For example, standard output of 100 units/hour for an operation means that output should be 100 units. Standard is considered the ideal and once determined is held fixed, perhaps indefinitely. Variance is the difference between standard and actual performance. If the operation produces 75 units/hour and the standard is 100 units, a negative variance of the dollar equivalent of 25 units is created for the operation. The manager must find a way to make up for the variance.

Standards and variances are impediments to continuous improvement. Standards on output volume put priority on doing whatever is necessary to produce at a fixed rate, regardless of demand. They encourage producing in large batches to eliminate setups, putting easy orders first at the expense of others, and maintaining high work in process (WIP) buffers and backorders to keep workers busy. Standards on material prices encourage selecting vendors solely for the lowest initial price, ordering in large quantities to get discounts, and ignoring factors like vendor reliability and product quality. Standards tend to limit improvement because once the standard has been attained there is no incentive to do better.

Most standards are internally developed and some are quickly outdated; nonetheless, they are used as normative. Although a standard might actually be quite unsatisfactory when compared to what competitors are doing, as long as the variance remains favorable, the organization continuous believing that it is performing as well as it has to remain competitive.

2. Direct Labor Productivity

Examples of measures of direct labor (DL) productivity are: Standard DL cost, DL efficiency, DL productivity and DL utilization. Measures like these emphasize keeping people busy at producing output, whether or not demand warrants it. They put sole importance on quantity at the expense of quality, customer service and accumulation of inventory.

3. Overhead Allocation and Direct Labor

Overhead costs that cannot be associated directly with particular outputs are allocated to departments and products. These costs include administrative, staff, and plant expenses for management, research,
engineering, marketing, utilities, maintenance, and depreciation as well as capital expenditures for equipment and facilities. Such costs are allocated throughout the organization, commonly as a percentage of every direct labor hour charged. Labor hours are used because they are the most easily counted things in organizations. The principle problem of this allocation method is the high priority it puts on reducing labor and the lack of priority it puts on reducing overhead.

4. Machine Utilization

Machine utilization is proportion of available time a machine is producing output. Criterion like this encourages maximum equipment usage. Although high machine utilization is not detrimental as long as it is directed toward satisfying demand, machine utilization for its own sake is wasteful. Every moment is spent producing: items not needed become inventory, and no time is allotted for preventive maintenance.

5. Quality Requirements

Many organizations abide by rigorous requirements to assess product and service quality, however, like measures described above, criteria are developed internally and are inwardly focused. The organization does not know how customers use its products, what they like or do not like about the products, what they expect, or what standards of excellence are for the industry. A company can fulfill 100% of its internally developed quality requirements and still go out of business for not having satisfied customers. Strict quality requirements are fundamental, but strictness must be gauged by the customer’s measures.

D. LIMITATIONS OF TRADITIONAL CRITERIA MEASURES

Most traditional performance criteria and measurement systems suffer similar limitations when it comes to continuous improvement and competitiveness. The limitations are symptomatic of a larger problem, a way of viewing the business world that is antiquated and is still perpetuated by traditional management culture and business education. This paper classifies the limitations into three categories: emphasis on financial criteria, emphasis on pieces of the system, and emphasis on the past and the present.
1. Emphasis on Financial Criteria

Traditional criteria primarily assess overall performance in terms of a single perspective: financial. While financial strength is certainly necessary for organizational well-being, financial criteria alone can neither portray all realms of performance nor indicate all actions necessary to improve performance. For that matter, no single criterion tells the full story. An organization needs a wide range of measures tailored to its long term goals so managers can determine what actions to take and assess the results of those actions. As long as emphasis remains on optimizing a few financial measures, actions necessary to achieve long-term success get neglected. In many organizations the emphasis is on minimizing capital expenditures and labor cost with no consideration about the non-financial, long term effects. A related example (Rydz, 1990) is from U.S textile industry. Total lead time for fabric from when it is manufactured, through its use in making garments, to when it is purchased as an article of clothing is as much as 60 weeks—virtually all spent in various forms of storage. In recent decades, most of the US textile industry has moved overseas to save on labor costs. Rydz argues that had the industry focused on reducing lead times instead, it could have achieved comparable savings and retained many US jobs.

In general, emphasis on simple financial measures causes managers to look at all problems in similar ways and precludes them from looking at other possibilities. In a given situation, machine speed and labor costs might only be a small part of the problem, although traditional measures treat them as being the whole problem. If an organization chooses goals such as reducing waste or gaining competitive advantage, it must use decision criteria and performance measures compatible with these goals.

2. Emphasis on Pieces of the System

Traditional criteria take the reductionist approach and split organizations into pieces, treating each as if it were autonomous. Standards and goals motivate employees to try to optimize the performance of their department, workcenter, or machine, without regard to the effect on the overall system. The implicit assumption is that if all subunits are optimized, individual performance of the entire system is optimized. This is, of course, contrary to the fact that optimizing subsystem performance does not optimize system performance.

An example of this piecewise thinking is machine utilization. Each machine is treated as sovereign and has the goal of maximum utilization. In
actuality, the feasibility of maximizing utilization should depend not on the machine, but on the entire process of which the machine is a part. Possibly the machine should be highly utilized, but that depends on the demand for its output and whether machine is a bottleneck. If the machine is bottleneck, it will be utilized more than if it were not. Even then, however, the utilization should depend on the flow of materials to the machine, which is wholly determined by push or pull of materials from elsewhere in the process. In all cases, a machine’s utilization should be considered as the result of requirements imposed by the overall process, not as a goal in itself.

3. Emphasis on the Past and the Present

Traditional measurement criteria emphasize performance in recent review periods and motivate actions to achieve short-term goals. For example, a company may consider outsourcing a major portion of its production base to reduce plant operating expenses. Lower expenses make for higher profits, which result in larger dividends in the next period. But, as one study argues (Bettis, Bradley, Hamel, 1992), through outsourcing a company can also relinquish important manufacturing skills and technology, which in the long run can severely reduce its ability to keep abreast of product and process development. Meanwhile, the study states the supplier gains the knowledge to master the technology of the product it is producing under contract. At some point the supplier might become capable of initiating its own product development efforts, and eventually to produce and distribute the product on its own. The customer, having sold off its technology and divested itself on manufacturing capability, is forced into the paradoxical situation of relying on its (now) competitor to be its supplier. The demise of the US television manufacturing industry is a good example of this.

E. GLOBAL ENLIGHTENED MEASURES

Global enlightened measures are ways of looking at organizational performance from a world-class worldview. Some of these measures can be used for comparing organizations in terms of world-class status, but unlike traditional measures, few are necessarily presumed to be universally applicable. Each organization must select the measures that best represent its goals. The measure should enable monitoring of all significant performance aspects of the organization, including its inputs, internal processes, final outputs and customer satisfaction. Doing well on one or a few measures is
not sufficient to allow general conclusions about the status of an organization, though doing well on many of them is a good indicator of world-class performance. The following measures are arranged into nine categories. Yet, our objective here is not explaining these measures. We just wish to pronounce each of them briefly. Many of the measures described could arguably belong to more than one category: productivity, asset utilization inventory, set up time, lead time, layout, equipment, quality, schedule, supplier, performance and flexibility.

F. PRINCIPLES OF THE GLOBAL ENLIGHTENED MEASURES

In global economy, organizations must measure performance in ways consistent with world-class worldview. Many kinds of criteria measures can be used. In general, global measures of performance can be characterized by their focus on competitiveness, on common sense, target values, on coordinated measures and on long term improvement.

1. Competitive Focus

World-class organizations succeed by anticipating, meeting and exceeding customer expectations. They provide products and services that meet standards of quality, flexibility, innovation, lead time and cost established by the competitive environment. Since meeting such standards is what determines a firm’s ability to compete, the same standards should be the criteria an organization uses to assess its overall performance. Flexibility, for example, can be measured by average number of jobs mastered by employees, time to setup a machine or change over a line or average time to conceive, produce and deliver a new product. A traditional measure like standard cost ordinarily does not measure competitiveness, though it could if it were used for comparison to competitors’ costs or what customers are willing to pay. Similarly, internal due dates alone mean relatively little unless they can be used to beat the competition and exceed customer requirements. Being world-class means comparing oneself to world-class peers, competitors and otherwise.

2. Target Values

Every measure should have a target value. When measures are first decided, baseline performance for the process should be established. As the process is improved, the measure will provide the feedback on their progress
to the workers who own the process. But, if there are no targets for improvement, then any improvement is okay. Also, targets chosen should be slightly out of reach for improvement for the period selected. The reason for this is to compel new thinking and force breakthrough progress. When targets are set too low, there is little incentive for improvement. However, when targets are set too high, or set high without intermediate targets, there is little incentive for improvement because the employees do not believe that they can be attained (APICS, 2001).

3. Coordinated Measures

All measures should be coordinated with one another. Measures that are not carefully chosen will often conflict with one another. For example, a labor productivity measures may cause the foreman to set up a machine once and then run large quantities of a part to maximize the measure that has the greatest reward and the least penalty.

4. Emphasis on Clear Measures

Adopting global enlightened measures is a move toward greater reliance on physical indicators of performance. Containers of inventory, setup time, number of parts, and number of defects are physical measures that represent things that anyone can readily see, determine and understand. They are often immediately visible and can be acted upon without calling upon a meeting or waiting for the next report. For example, a manager who sees inventory building up can look directly at customer orders to see whether they warrant the inventory, and, if they do not, he can take action to reduce it. Similarly, a line worker holding a defective item is able to recognize it, correct it, or stop the line, rather than ignore it for lack of knowing what to do.

Measures not of physical things, like productivity, availability or utilization can also be relevant and useful, but only if they tap aspects of organizational performance that make clear sense in terms of competitiveness and customer satisfaction. Any measure can be an effective motivator of behavior as long as the logic between the measure and its repercussion on competitiveness and customer satisfaction is obvious to everyone including shop floor level people. Lead time ratio, machine effectiveness and head-count productivity are examples of nonphysical measures where logic can be readily conveyed to anyone.
Global enlightened measures must not only be easy to understand, they must be easy to obtain and utilize. Data can usually be acquired from existing formal data collection systems or by workers and staff taking periodic counts. Computations are straightforward and can be performed and comprehended by anyone in the company because measurement is everyone’s territory, not just managers’ or accountants’. When everyone knows the measures and what they signify, everyone knows where the organization is headed.

5. Emphasis on Trends and Long-Term Improvement

Decisions that might improve immediate performance must always be weighed against the long-term consequences. Sole attention to traditional financial measures often leads to actions oriented toward boosting economic performance while ignoring the long term results. An organization that remains static in a world that demands continuous improvement is, comparatively, getting worse.

World-class organizations ensure their survival by investing in the future. They know that trends in performance are as important as existing performance and that progress is assessed in terms of steady changes upward or downward. They monitor improvement trends in productivity, quality, equipment availability, set up times, lead times, schedule adherence, and virtually every other kind of activity for which the collect data. To gauge improvement, they compare numbers year-to-year for organization wide measures and more frequently for the subunits of the organization. The impact of every subunit’s improvement on long term organizational health is assessed, and units that need more improvement or that contribute the most to organization wide competitiveness and improvement (research and employee training) get priority, even if the consequence is to reduce organizational performance on some measures in the short run. In the following section, we wish to discuss how to select performance measures.

G. SELECTING PERFORMANCE MEASURES

Establishing a performance measurement system must start with a review of current measures and systems (Santori and Anderson, 1987). The review may involve: Documenting current measures, confirming strategic objectives, identifying success factors critical for meeting objectives, identifying manufacturing process trends that affect the company, determining new and revised performance measures, comparing current and
proposed measures, assessing cultural impacts of the new measures and how to deal with them, and planning the approach to implement the new performance measurement system.

Once the performance measurement system is in place, criteria measures must be periodically reviewed for relevance to current competitive requirements and business changes. Measurement system should be reassessed for its ability to connect measures at all levels and functions to company strategic objectives, motivate consistent action throughout the organization. Similarly, each measure used in the system should be periodically reassessed for its ability to accurately reflect a particular aspect of performance. Just as yesterday’s measures are not representative of today’s worldview, today’s measures might not represent business in tomorrow’s world. Different measures serve different purposes while one set may be necessary to move an organization to world-class status, another might be needed to keep it here.

H. CONCLUSION

This paper discussed drawbacks of traditional measurement systems and proposed a new global enlightened measurement system which may enhance capabilities of an organization and hence will keep it ahead of its competitors. If strategic goals are to be developed and achieved, it is critical to develop performance measures that are supportive of these objectives. As goals are achieved, performance measurement should similarly evolve. This will ensure the long term health of the organization.

REFERENCES
