DEVELOPING PERFORMANCE INDICATORS FOR BUSINESS IMPROVEMENT

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The leading indicators of business performance cannot be found in financial data alone. Quality, customer satisfaction, innovation, market share- metrics like these often reflect a company's economic condition and growth prospects better than its reported earning do.
More and more managers are changing their company's performance measurement systems to track non-financial measures and reinforce new competitive strategies. The purpose of the paper is to present the most important performance indicators that can be used by organizations. The paper is designed to provide details on how to measure organizational performance.

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1. Introduction

In today's business environment, every conceivable advantage is being pursued by companies. They have implemented improvement tools and techniques, such as Total-Quality-Management (TQM), Just in Time Manufacturing (JIT), benchmarking, time-based competition, outsourcing, partnering, and reengineering and change management.
Companies have tried different organizational structures, changing reporting structures, upsizing, downsizing, contracting out, and empowering teams in an attempt to manage better their business and to obtain high values of performance. However, the majority of companies have not been able to effectively measure performance. The single largest contributing factors to this have been the lack of a proper understanding of the management functions and the development of measurement and control systems for organizational performance.

2. Performance Measures

Performance measures have been misunderstood and misused in most companies today. Performance indicators are just that, an indicator of performance. They are not to be used to show someone is not doing their job in the company and how, now that they are exposed, they can be dismissed. Performance indicators are also not to be used for "ego gratification" that is, to be used for comparison with another company to show how much better one company is than another. Nor are performance measures to be used to show "we are just as good as everyone else in our market, so we don't need to change".[107]
Properly utilized, performance indicators should highlight opportunities for improvement within companies today. Performance measures should be used to highlight a soft spot in a company and then be further analyzed to find the problem that is causing the indicator to be low. Ultimately, they can point to a solution to the problem.

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107 T. Wireman, "Developing Performance Indicators for managing maintenance" 2nd edition, ed. Industrial Press, USA, 2005, p. 9.

This implies that there should be multi-level indicators. One layer of indicators is at a corporate strategic level. A supporting level is the financial performance indicator for a particular department or process. A third level is an efficiency and effectiveness indicator that highlights what impacts the financial indicator. A forth level is a tactical level indicator that highlights the department functions that contribute to the efficiency and effectiveness of the department. The fifth level of indicator is the measurement of the actual function itself. Figure 1 shows this tiered approach to performance indicators.

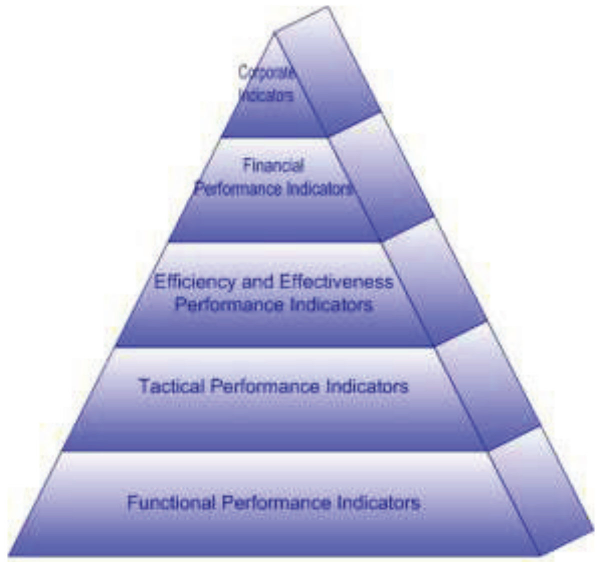

Figure 1: The Hierarchical Performance Indicators[108]

While the pyramid provides the hierarchical relationship of the performance indicators, it should be noted that the indicators are determined, not from the bottom up, but from the top down. The corporate indicators are measuring what is important to senior management to achieve the corporate vision. Corporate level indicators will require the entire organization to focus their efforts on achieving the corporate vision.
The corporate indicators will vary from company to company, depending on their current market condition, business life cycle, and corporate financial standing. Even different parts of the corporation may be measured with different indicators. For example, in energy exploitation and production, a particular field will be measured based on where it is in its life cycle. A new field will tend to have higher spending levels for operations and maintenance; whereas a field that is nearing the end of its life cycle tends to have lower operating and maintenance expenses.
Because corporate indicators focus on achieving the long-term vision, all subsequent indicators must focus the organizational levels on supporting the corporate direction. If the indicators are not connected, the overall organizational effort is sub-optimized, endangering the corporation's survival when faced with competitors who have grater focus.

3. Objectives of Performance Indicators
Performance indicators should be integrated and interdependent in order to provide an overall perspective on the company's goals, business strategies, and specific objectives.
During the process of developing performance indicators, the following should be considered:

108 T. Wireman, "Developing Performance Indicators for managing maintenance" 2nd edition, ed. Industrial Press, USA, 2005, p. 10 (Introduction).

1. Make strategic objectives clear, in order to focus and bring together the total organization. Senior manager must clearly communicate the company vision.
2. Tie the core business processes to the objectives. Maintenance is a core business function if you have assets or equipment.
3. Focus on critical success factors for each of the processes, recognizing there will be variables.
4. Use the indicators to track performance trends and to highlight progress and potential problems.
5. Identify possible solutions to the problems.

Many companies need a performance indicator system that truly pulls together all parts of the organization in a strategic model. This model allows for optimum return on the investment in the business, thus constantly attracting investors. Keeping the five points above in mind will assist in assuring development of a good performance indicator system.

4. Examples of Performance Indicators

The correct way to develop performance indicators is to work from the top or corporate level, and then develop indicators at each subsequent level to allow the indicators to be connected. If the indicators are selected at the bottom and then built upward, they may be conflicting rather than supportive.

4.1. Corporate Indicators

These indicators are the long-term strategic indicators that upper management utilizes for business planning. The window of planning is typically for the three-to-five-year strategic plan.

Table 1: Examples of Corporate Indicators [109]

Corporate Indicators	Observations
Total Cost to Produce (Manufacture)	This indicator compiles all the costs needed to produce a product. It is used to calculate the profit margin because the difference between this cost and the sales revenue is profit.
Total Cost of Occupancy	This facility measure compiles all the costs needed to occupy a facility.
Return on Net Assets (RONA)	This indicator measures the profit earned compared to the net value of the company assets.
Return on Fixed Assets (ROFA)	This indicator compares the profit earned to the net value of the fixed company assets.

4.2. Financial Indicators

These indicators are used to insure that the departments in a company are meeting the financial goals set in the strategic plan. These indicators are monitored annually. If the annual figures are not in compliance with the forecast then the analysis would start at the next level in the hierarchy. No organization will use all of these indicators, but will choose the ones that support the selected corporate indicators.

109 T. Wireman, "Developing Performance Indicators for managing maintenance" 2nd edition, ed. Industrial Press, USA, 2005, p. 207

Table 2: Examples of Financial Indicators used by Maintenance Management [110]

Financial Indicators	Observations
Maintenance Cost per Estimated Replacement Value of the Plant or Facility Assets	This indicator is becoming standard. It is an accurate measure for plants and facilities because the cost is usually fixed. This aspect also makes the indicator easy to use to trend any increases over time.
Stores Investment as a Percentage of Estimated Replacement Value	This indicator is also becoming standard for measuring stores investment. The indicator is easy to use to trend any increases over time. If the percentage of stores costs increases, then the efficiency and effectiveness indicators should show what maintenance or stores function caused the increase.
Value of Asset Maintained per Employee	This indicator is another measure for plants and facilities because the asset cost is usually fixed.
Maintenance Cost per Unit Processed, Produced, or Manufactured	This indicator, which is the maintenance costs divided by the volume of production, is a common measure of maintenance performance, although it is not necessarily one of the best. The production volumes vary for reasons not under the control of the maintenance department. If the maintenance department is held accountable for this indicator, then poor decisions will he made related to the maintenance strategies. The organization will be upsized, downsized and otherwise impacted due to the fluctuations of the indicator. This indicator is good for a broad, trending indicator, but should never be used as a sole performance indicator.

4.3. Efficiency and Effectiveness Performance Indicators

Effectiveness emphasizes how well **a** department or function meets its goals or company needs. It is often discussed in terms of the quality of the service provided, viewed from the customer's perspective. Efficiency is acting or producing with a minimum of waste, expense, or unnecessary effort. Efficiency compares the quantity of service provided to the resources expended: Is the service provided at a reasonable cost? Efficiency measures concentrates on how well a task is being performed, not whether the task itself is correct. Effectiveness concentrates on the correctness of the process and whether the process produces the required result.

A common problem in efficiency and effectiveness performance measurement is the reporting of' process measures (workload) or input measures instead of output measures (e.g., effectiveness and efficiency).

110 T. Wireman, "Developing Performance Indicators for managing maintenance" 2nd edition, ed. Industrial Press, USA, 2005, p. 209.

Table 3: Examples of Financial Indicators used by Maintenance Management [111]

Efficiency and Effectiveness Performance Indicators	Observations
Work Order Systems	This indicator can be calculated as percentage of work distribution by type of work order
Technical and Interpersonal Training	This indicator can be calculated as estimated lost time due to lack of knowledge or skills on total worked time
Operational Involvement	This indicator ca be calculated as current maintenance costs on maintenance costs prior to predictive program.

4.4. Tactical Performance indicators

The tactical performance indicators monitor the function indicators in a longer-term window of a quarterly or 90-day timeframe. This window allows time for trends to develop. By monitoring the tactical indicators, companies can identify required changes highlighted by pyramiding of the functional indicators. Changes can then be made to all processes before the efficiency and effectiveness of the organization is impacted to the degree that the annual financial performance indicator targets are missed.

Tactical indicators focus on the individual processes. However, optimizing one process may have a negative impact on other processes. Therefore, the efficiency and effectiveness indicators are important; they *evaluate* the overall organization whereas the tactical indicators evaluate only specific processes.

The following list of tactical indicators can be used by different organization. No organization will use all of these indicators, but will choose the ones that support the selected efficiency and effectiveness indicators.

Table 4: Examples of Financial Indicators used by Maintenance Management

Tactical Indicators
Preventive maintenance tasks completed/Preventive maintenance tasks scheduled
Total number of orders not filled/ Total number of orders requested
Hours of maintanance activities performed by operators/Total hours in time period

4.5. Functional Maintenance Indicators

Functional indicators derive their name from the word function. Simply put, the indicators show how one of the five management-specific functions is performing. The following list reviews the specific functions required of or expected of a organization.

- Preventive Maintenance.
- Stores and Procurement.
- Asset Management Systems (EAM).
- Work Flow Systems.
- Operational Involvement.
- Predictive Maintenance.
- Technical and Interpersonal Training.
- Continuous Improvement.
- Statistical Financial Optimization.
- ETC.

111 Idem, p 212.

The functional indicators mentioned previously in this book show how well the parts of the function are doing in supporting the tactical issues. No organization will use all of these indicators, but will choose the ones that support the selected tactical indicators.

5. Conclusions

The corporate mandate is to keep the costs low while insuring the long-term viability of the company assets. Each company function that contributes to production costs must be as efficient and effective as possible. The tactical focus is one of insuring optimization of the overall costs on a quarterly basis. The functional support focus on optimizing each component of the business processes.

This paper tried to offer a larger image on what performance indicators could be used by companies in order to measure their viability. In summary, the performance indicators are the key to the continuous improvement process. As a future area of research we would recommend finding other indicators which could be included in one of the five main categories: corporate, financial, efficiency and effectiveness, tactical and functional performance indicators.

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