

INTEGRATING MAINTENANCE PERFORMANCE WITH CORPORATE BALANCED SCORECARD

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ABSTRACT

The concept of balanced scorecard has created a lot of interest amongst the companies and strategists since its appearance in 1992. Companies, to get a balanced view of their business strategy performance are applying it and gradually, managers are trying to use this concept for efficient management of maintenance process. It is felt that balancing the different parameters of the scorecard alone will not be able to deliver the desired expectations of the management without integration of all strategic and performance parameters of the maintenance. Therefore, an integrated approach should also be applied to business strategy management, to overcome the non-optimisation of overall equipment effectiveness.

In this paper, an integrated approach is applied linking the maintenance performance indicators with the corporate balanced scorecard.

KEYWORDS

Performance measurement, Performance indicators, Balanced scorecard, Corporate strategy, Key performance indicators, Critical success factor and Key result area.

INTRODUCTION

More and more studies are carried out to ascertain and establish the relationship between maintenance performance and reliability of the productive or operative system, with overall profitability and corporate strategy. Performance measurement provides a base for improvement since without measurement there can be no certainty of improvement. Maintenance performance indicators are used for the measurement of maintenance performance, as performance indicators are just that of an indicator of performance (13). An indicator is a product of several metrics (measure), when used for measurement of maintenance performance in an area or activity; is called the maintenance performance indicators (6).

The age-old practices of measuring performance based on the financial results alone of the company were found to be inadequate and inefficient. While different techniques were tried out in piece meal manner, Kaplan and Norton introduced the concept of balanced scorecard in 1992 as a new approach to fulfil several managerial requirements. The balanced scorecard is an integral part of the management process, which motivates breakthrough improvements in critical areas as product, process, customer, and market development **(16 and 2)**. Today, in the corporate world, the strategy map and balanced scorecard have been integrated to measure the performance and achieve the corporate objectives.

Maintenance performance measurement is a complex task since multiple inputs and multiple outputs are involved in the process **(7)**. While considering various maintenance performance indicators from corporate strategy point of view, it is felt that, these indicators are required to be considered for integration with the balanced scorecard from a balanced corporate strategy point view. In this paper an attempt has been made to develop an approach to link and integrate the maintenance performance indicators with corporate balanced scorecard.

MAINTENANCE PERFORMANCE INDICATORS

Performance indicators compare actual conditions with a specific set of reference conditions. They measure the distance(s) between the current environmental situation and the desired situation (target): 'distance to target' assessment **(10)**. The purpose of measuring maintenance performance is designed to help and predict future action and performance based on past data. Under a corporate scenario, in order to achieve maintenance excellence, a continuous support from the top management is very critical. The management needs strong evidence in the form of maintenance performance indicators before providing further commitment and support to the maintenance activities, so as to be assured of achieving the corporate objectives. While selecting and deciding the metrics for measuring performance, appropriate and correct metrics be chosen, otherwise performance results could be misleading. Working for achieving maintenance excellence, maintenance performance indicators must yield objective performance facts of the corporate balanced scorecard. Performance indicators should be integrated and interdependent to provide an overall perspective on the company's goals, business strategies, and specific objectives. In order to focus and streamline performance indicators, the term "key performance indicators" has come to identify the key objective performance, which could consist of several indicators and metrics **(6)**. While determining the performance level of maintenance, its strength and weaknesses has to be considered and accordingly the key performance indicators has to consider those areas for which the management of the corporate is interested.

Leading and lagging indicator

Key performance indicators could be broadly classified as leading or lagging indicator **(6)**. A leading indicator is the one, which warns the user about the non-achievement of objectives beforehand. A leading indicator is one of a statistical series that fairly reliably turn up or down before the general economy does. Common leading indicators are building permits (suggesting the future volume of new construction), common stock prices, business inventories, consumer instalment debt, unemployment claims and

corporate profits (11). A leading indicator thus works as a performance driver and supports the concerned head of the department/section to ascertain the present status with comparison to the reference one. To know, how it is likely to be tomorrow or next year, you need soft or perceptual measures like customer satisfaction and employee commitments. Perceptual measures are often leading indicators in the sense that they are highly predictive of financial performance. When such measures are tracked today, it leads to less worrying about missing tomorrow's budgets. (1).

A lagging indicator normally change direction after economy does. Lagging indicators are useless for prediction; the value of construction completed for example, is outdated (11). It would indicate the condition/status after the performance has taken place. The maintenance cost per unit or return on investment calculation, could be the example of lagging indicator. The establishment of a link between the lagging and the leading indicator makes it possible to control the performance of the process. Furthermore, indicators are to be chosen in line with the chosen maintenance strategy (15). The balanced scorecard is an integrated set of leading and lagging performance measures designed to capture an organization's strategy. These performance measures are selected to eliminate information overload and allow management to focus on the key strategic objective of the firm (5).

The list of performance indicator is a long one. But each organization's selection of performance indicators will vary as per their corporate strategy objectives and requirements. From maintenance objective point of view, a sample list of key performance indicators has been prepared, which could be as mentioned below:

Finance performance

- Maintenance cost/unit
- Return on investment (ROI)(in maintenance term)

Process perspective

- Overall equipment effectiveness (OEE)

Customer satisfaction

- Number of complaints/call back of equipment
- Customer satisfaction (Value for money- feedback etc.)

Innovation and development

- Number of new ideas generated
- Skills and competency development/training
- Outsourcing of skilled manpower

Concern for employee and society

- Number of accidents/casualty
- Number of health, safety and environment (HSE) complaints received or raised by regulating authority
- Employee complaints

It is relevant to note that, the full list of indicators could be very long, but in an organization the number should be kept as low as possible, as it is not possible to monitor and control a large number of indicators (5).

CORPORATE BALANCED SCORECARD

The balanced scorecard considered non-finance measurements and the intangible assets as the companies achieved competitive advantage from their investment and management of tangible asset to the intangible assets **(9, 8 and 4)**.

The balanced scorecards provide a framework for organizing strategic objectives in to four perspectives: **(3)**.

- Finance
- Customer
- Internal business process
- Learning and growth

The scorecard framework is build up to be applied on different levels of the corporate levels of the strategy of the firm. **(14)**. A strategic map is a logical and comprehensive architecture for describing strategy. A strategy map specifies the critical elements and their linkages for an organizations strategy as mentioned below **(4)**.

- Objectives for growth and productivity to enhance shareholder's value.
- Market and account share, acquisition, and retention of targeted customers where profitable growth will occur.
- Value propositions that would lead customers to do higher-margin business with the company.
- Innovation and excellence in products, services, and processes that deliver the value proposition to targeted customer segments, promote operational improvements, and meet community expectations and regulatory requirements.
- Investments required in people and systems to generate and sustain growth.

The balanced scorecard is intended to link short-term operational control to the long-term vision and strategy of the business. Thus the company focuses on a few critical key ratios in meaningful target areas, forcing to control and monitor day to day operations as they affect development of tomorrow **(12)**.

When these corporate strategies are linked to a logical strategy map structure and that of the balanced scorecard, a basic understandable reference is created amongst all the units, subunits and employees of the organization. A scorecard makes sense primarily for business units and divisions with a well-defined strategy. Most companies have several divisions, each with its own mission and strategy, whose scorecards cannot be aggregated into an overall corporate scorecard **(2)**. This is mostly because the division and group prepare their own scorecard inline with the corporate scorecard.

INTEGRATING THE MAINTENANCE PERFORMANCE INDICATORS

Today, after optimising other business areas of the industrial/corporate world, the focus is more on the areas of maintenance and logistics. Most of the organizations are paying more and more attentions to their less optimised area of operation with a direct impact on the corporate strategy/objectives. The importance of maintenance is considered from both tangible and intangible assets.

In any organization, the corporate objective is formulated keeping the corporate vision and mission statement in view. A corporate strategy is formulated as the way and means for achieving corporate objectives. Corporate balanced scorecard forms part of the corporate strategy to measure the performance and compare the same with corporate objectives. This

forms the reference/bench mark to compare the activities/indicators with the actual. These balance scorecards of the corporate strategy are translated to different divisions, departments and down to employee level so that it can be judged and evaluated at various level. Similarly, maintenance performance indicators can be translated from different balanced scorecard perspectives down to the divisions, department, section and employee level. While considering the balanced scorecard perspectives, it is important to introduce health, safety and environment (HSE) perspectives, additional to Kaplan and Norton's basic four-balanced scorecard perspectives. HSE has been considered and included, as this forms a very critical and mandatory requirement for the process industries like, oil and gas and mining industries today.

At figure 1, down below the relationship between the vision statement of the corporate to the objective and corporate objective to balanced scorecard and maintenance objectives are given. The maintenance objectives are linked in to critical success factors, key result areas and key performance indicators. The critical success factors are the factors, which critically provides support to achieve the maintenance objectives. The key result areas are the areas, successes of which are the key factors to achieve the maintenance objectives. The linkage and relationship between balanced scorecard perspective and maintenance performance indicators at the corporate, department and group level are indicated block wise.

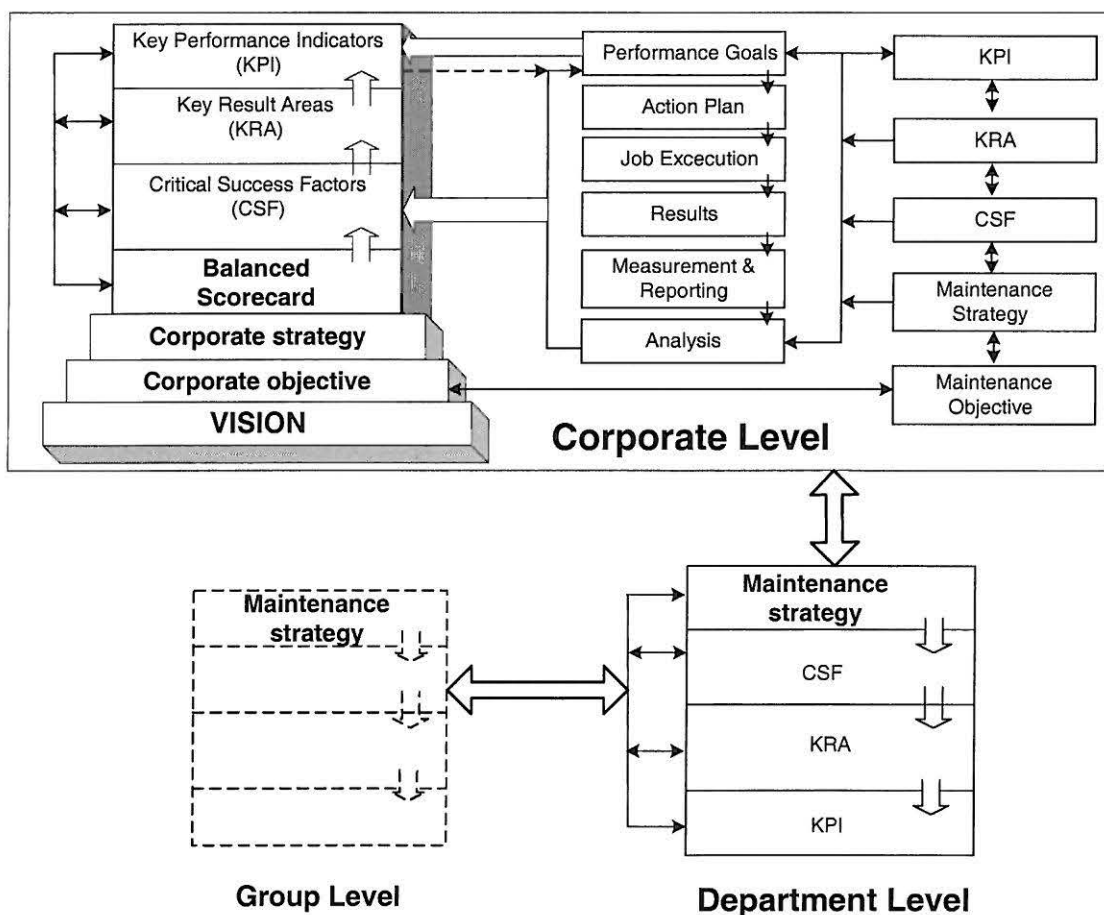


Figure 1. Linkage and relationship between BSC and maintenance performance indicator at corporate, division and group level.

As shown at the figure 2, below, the corporate objective can be linked to maintenance objectives of the corporation. All divisions/ departments of the corporate having maintenance functions and staff should ideally be communicated, trained and made aware with the maintenance objectives, its critical success factors, key result areas, key performance indicators and performance measurement's importance with the reference point. Once this linkage and integration is achieved by an organization, in all possibility, the organization can achieve maintenance excellence, which could support the organization to achieve its corporate objectives.

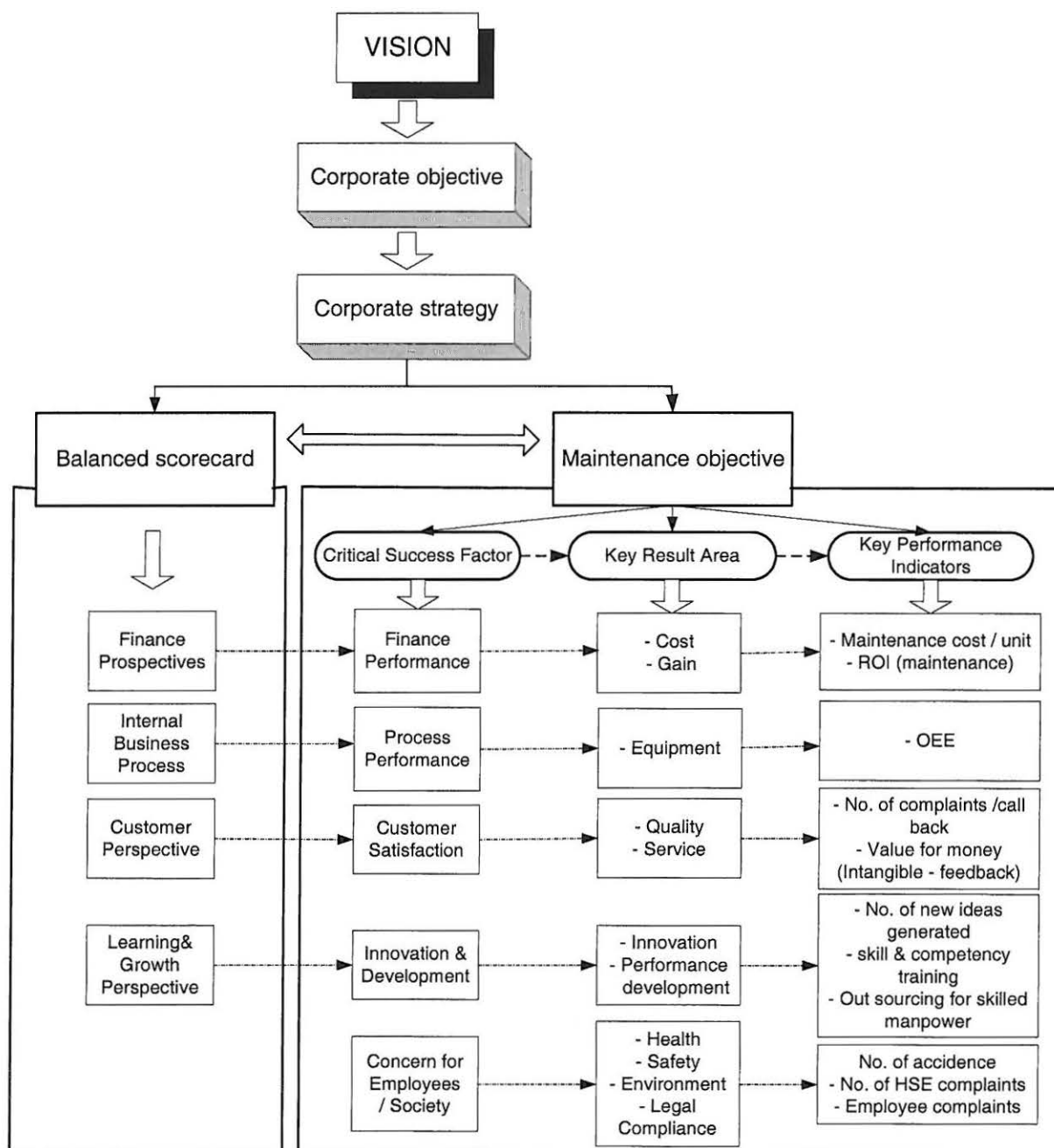


Figure 2. Linkage and relationship between corporate objectives and balanced scorecard with maintenance performance indicators.

CONCLUDING REMARKS

This linkage and integration is important for effective management of maintenance process in an industrial organization. If performance measurement is effective, it will provide a sound basis for resource allocation and control. In this paper, we have discussed and presented different aspects of maintenance performance management and its linkage with the corporate objectives. A framework, for describing relationship between corporate strategy and maintenance parameters is also worked out.

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