

# APPROACHES ON THE OPERATIONAL PERFORMANCE OF PRODUCTION SYSTEMS

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## ABSTRACT

*The performance concept originated from the concept of firm management. The performance management of the firm involves improving its value-cost relationship, which means that the firm will be able to build a product or service, in terms of achieving cost and profitability targets, and compare the results with strategic forecasts.*

*In addition, performance management also requires the firm's ability to develop a dynamic and continuous progress. In such conditions, its performance evaluation is not an objective in itself, but a means used by the organization to achieve progress.*

*The paper will address issues which relate to improving performance and all the instruments used for this purpose.*

**KEYWORDS:** *management, competitiveness, operational performance, performance management, production systems*

In our approach, we would like to begin with the definition of the performance given by the group L'Afnor, national and international operator in France in the service of enterprises" and civil society"s performance and sustainable development, according to which "performance measures the effectiveness and / or efficiency of a process or of a portion of it, or of a real (or simulated) system, according to a rule, a plan or a goal settled through a company"s strategy". [8]

This type of evaluation must reach the purpose for which it was created, namely to implement the company strategy and communication of the project and the vision of the enterprise. In this way, the management of the company together with its employees will be able to focus on ways to implement the project and the correlation of operational initiatives and actions.

If we admit that an enterprise must succeed both with the real products and in the financial markets, an operational performance management strategy aims at combining the two concerns. This will establish a correlation between getting maximum value for the final client at the same time as the company owner.

At present, neglecting one of the two markets will have consequences on the other, shareholder being the customer enterprise on financial markets, and the customer being the consumer on the products market.

From the perspective of product markets, firms must respond to the customers' and competitors' pressures, in order to have delivery periods as short as possible and various services, customized and innovative products, at lower costs, competitive prices and an increasing quality. Faced with such situations, the enterprise has to evolve in the same direction as the customer demands, while anticipating them. All these constraints generate a set of transformations in the enterprise, which will lead to an increasing need to improve operational performance.

In order to improve operational performance, the enterprise has to respond to the increasing pressure of competition by improving profit in each period, or by simply maintaining profitability and competitiveness of its products. This situation is added in many cases to the trend of continuous rising of costs and prices, with effects such as:

- increased customer expectations with respect to products, services and their delivery times;
- increased competition for workers in countries with low labor costs;
- continuously increasing volume of investments in order to become more responsible for environmental and safety standards.

Therefore, maintaining operational performance implies the existence of several possibilities for rationalization.

### **1 Reactive planning of the production flows and cost reduction**

To use these rationalization opportunities, the enterprise uses several types of plans, which formalize the strategy and its different objectives. This plan sets out the markets where the company wants to place the products that it wishes to develop, depending on customer demands. The business plan defines the various families of products, investment in human and material resources on long term, while the manufacturing program organizes short-term priorities.

Various levels of forecast (short, medium or long), and also of decision (enterprise management, staff and operators) must be chained in a coherent manner and must adapt to the variations in demand.

### **2 Optimization of industrial assets**

Industrial activity consists in rhythmic cycles that can not be entirely controlled. Thus, there are three main cycles:

- the trade cycle (or period desired by the customer);
- the production cycle (or period of product development);
- the financial cycle.

These cycles are not synchronized, and, for the company, it is important to minimize the gaps between them. Synchronizing the cycles is variable, depending on the sector in which the enterprise operates. If the trade cycle is shorter than the production cycle, production must begin before getting orders and receipts, which greatly hampers the financing of the activities. [5]

In this case, there may be the following ways to solve the problem:

- ✓ reducing costs by using management systems of manufacturing processes and of the materials consumption;
- ✓ increasing efficiencies of the production equipment and limiting of cases of non-quality.

a) *Action on various categories of expenditures.* This leverage is about reducing direct and indirect production costs by reducing material and time consumption, respectively through process automation, optimization of transportation costs and increasing staff skills.

b) *The action on the production equipment.* Strong interdependence between the period of production, customer needs and the production equipment requires enterprises to increase the flexibility and capacity of machines because the delivery periods and product demand are imposed by the client. Using the indicator “Utilization degree of working time of the production equipment”, together with setting the targets for improvement, allows solving problems of rhythm, frequency and duration of the loading equipment or reduces the number of unexpected failures.

Technical and technological progress must be accompanied by organizational innovations (autonomous work teams, information technology) or social innovations (new time management schemes) in order to continuously improve the enterprise’s productivity.

### **3 Organizing activity based on supply chain [3]**

Currently, the company requires departments to better coordinate their activities and services to achieve customer satisfaction. In this context, new concepts arise, such as:

- ◆ the global logistics responsibility of the enterprise;
- ◆ the optimization of organizing activities with reduced fixed expenses and acquisition costs, in order to achieve a competitive cost level;
- ◆ management by activities or by processes;
- ◆ strategic alliances;
- ◆ electronic commerce.

All these concepts have in common a basic concern to find new optimization solutions, offered mainly by informatics systems. Integrating internal and external logistics of the company aims to cut costs and reduce delivery periods to customers; management processes that create value for enterprise allow the link between company’s activities and customers’ expectations.

### **4 Control of production systems in order to ensure quality, cost and delivery periods**

In order to achieve a certain volume of products or services, the activities must consume resources. Economic performance of these activities can be estimated by using three elements: quality, cost and delivery period. Often, the performance measurement system is supplemented by safety indicators (number

and severity of work accidents, incidents due to consumption of products or services etc.) and environmental impact (percentage of gaseous emissions, waste production etc.). Further, we present some of the mostly used indicators for measuring the performance of production systems.

a) *Indicators of the production process.* In order to assess the quality of activities, delivery times are often considered as key indicators for measuring their performance. Customers are very sensitive to the compliance periods and timely delivery of services. Periods of delivery are considered to be measured from the moment of ordering until delivery and execution of product or service. In this perspective, reducing cycles is a major objective of the production process. Another important indicator of the process is an indicator for measuring the flow's fluidity, which can be called "tension indicator of flow", denoted by TIF. Thus,  $TIF = \text{processing time} / \text{production time}$ , and therefore it is always lower than 1 or equal to 1. Processing time is the period when the product is manufactured or assembled. In industry, this indicator is generally less than 5% of production time. If the production is continuous, the production time of a product is equal to processing time, and then  $TIF = 1$ . Production time includes processing time, inspection time, the transfer time between jobs and waiting times. The theory upon which the indicator TIF is based, starts from the idea that times dedicated to other activities than those of processing (inspection, remediation of defective products, transfer between jobs and expectations) are times that do not add value to products. In addition, if the indicator is close to 1, the company improves its responsiveness to customer requests and create value. [2]

b) *Indicators of after-sales service processes.* Companies wanting to achieve performance in after-sales service activities can measure them by applying to these processes indicators of reactivity, quality and cost, as well as for production processes. This cycle, which begins with the call of customer and ends with the solution to his problem, can serve to measure the rapidity of the process of after-sales service. Billing and recovery process is part of after-sales service, and, in this case, reducing the period between the end of the process and regulating of the balance is a measurement indicator of performance of the processes. This is the case for companies that sell complex computer and electronic equipment, which know that their failure products are costly and strongly affect relationships with customers.

## **5 A multidimensional view of performance: Balanced Score Cards**

BSC is a tool for strategic control and performance management, developed in the years ,90 by Kaplan and Norton based on a study of performance measurement. [6] Thus, the BSC offers a multidimensional view of performance, defining the four perspectives of its analysis. The main objective of the BSC is to emphasize the creation of last value added, and the assessment of determinants of new value added.

*Financial perspective* takes into account the long-term objectives of the enterprise, and includes classical financial indicators; the novelty is given by companies' desire to adapt financial indicators to customers' reality (new customers, target customers, unprofitable customers, etc.) and to the creation process of products and services. This strategy takes into account the following financial targets: growth and diversification of business turnover, reducing of costs and improving labor productivity, better utilization of assets and investments.

*Customer perspective* regards to client specific indicators such as satisfaction or percentage of complaints. Given that products and services have increasingly more features, competitiveness of companies depends on the competitiveness of processes that support them.

*Process perspective* refers to all internal processes, and in particular to innovation, manufacturing and after-sales service. In terms of innovation process, one will first seek to identify new needs of potential clients. Performance of the research and development process must be sought not only in operational terms of activities, but in terms of their profitability. For performance management of production processes, one will use the classic indicators of quality, cost and responsiveness, to which specific indicators of supply activity can be added (criteria of choice of suppliers, processing orders and receiving operations) or the effectiveness of production cycles (efficiency during processing). After-sales services can have a significant impact on added value perceived by customer and can be controlled with indicators of cost, quality and customer response time to call.

*Innovation and learning perspective* refers to indicators that express the newly created value for customers by the number of innovations, the exploitation of specific skills, the development of learning organizational process and all those medium and long term actions that increase business performance. Currently, the BSC is used successfully in renowned multinationals to measure their performance.

## **6 Leadership, knowledge management and operational performance<sup>1</sup>**

It is clear that effective knowledge management has become a crucial issue for businesses [11], the main base for creating and sustaining organizations' competitiveness and their core competence capabilities. According to modern approaches, knowledge management is considered a key driver of organization's competitiveness, as it deals with different resources that can aid decision makers in many ways [7].

All the aspects of operational results are strongly correlated to knowledge management.

Also, leadership is clearly related to organizations' competitiveness, including operational results.

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The strategic leader is able to exert this strategic thinking on long term, despite of the numberless uncertainties that are associated to the today's business environment [9].

Amidon and Macnamara have identified seven domains to be analyzed – the so-called “7 C’s” of leadership: (a) context, (b) competence, (c) culture, (d) communities, (e) conversations and common language, (f) communications and (g) coaching. [1]. Collins identified Executive Leader who “builds enduring greatness” [4].

Conflict solving for a leader supposes development of his abilities in the following fields: diagnosis of the situation, planning for conflict solving, plan implementation, plan evaluation [10].

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