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## Article

# Development of concepts and models of performance evaluation from the 19th century to the present

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## DEVELOPMENT OF CONCEPTS AND MODELS OF PERFORMANCE EVALUATION FROM THE 19<sup>TH</sup> CENTURY TO THE PRESENT

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### Abstract

The main aim of this paper is to provide a framework of concepts and models from the area of performance measurement. Due to the fact that the business environment is constantly changing, changes also occur in the trends relating to performance. Traditional financial performance measures have been highly criticized and the need identified to integrate non-financial perspectives, such as level of innovation, degree of motivation, intellectual capital and other criteria. Intellectual capital is often a crucial factor in the creation of value in a company. This paper provides a literature review supplemented by the author's research in the field of performance. The article shows that the performance appraisal system is currently focused on several areas that could affect the performance of the company, which is also part of the overall performance of the economy in the form of GDP growth. Based on the research, it can be said that, for the sample tracked, the selection of performance evaluation system does not depend on the legal form of the business.

### Keywords

Performance, Measurement, Concepts, Models

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### I. Introduction

There are currently a number of concepts and models that are used to measure performance. Rigby (2010) presents, through Bain & Company, a great awareness of the need for management and the fact that it is desirable to choose the right management tools and process of performance measurement. He states that the successful use of management tools requires an understanding of the strengths and weaknesses of each tool and especially the ability to use the right tools in the right way and at the right time.

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In this dynamically changing business environment, the adoption of the appropriate performance management and measurement (PMM) framework has been recognized as a major challenge. Product manufacturers and service providers are largely service operations, so traditional accounting measures, such as cost schedules, variance reports, profit and loss statements, etc., and a static view of costs, are no longer appropriate in the modern business environment (Quinn et al., 1990).

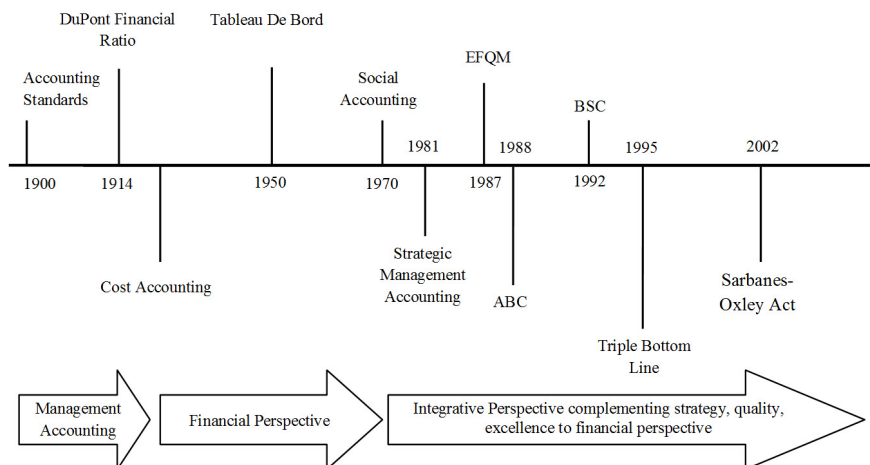
The aim of this paper is to define and categorize the development of concepts of performance measurement over time. In order to achieve this aim, a critical literature review and questionnaire survey (primary research) was used. The area surveyed was Information and Communication Activities, and the focus was especially on companies in the Czech Republic with more than 250 employees.

The structure of the article is as follows. Section 2 describes the theoretical background of performance measurement systems. Section 3 reveals the estimated results and the last section discusses the results (key findings) with the summary of other selected groups of models.

## II. Methodology of literature review

Yadav et al. (2013) have elaborated upon historical developments that occurred in the area of performance evaluation models and the trends which have resulted in changes in these models over the years. These authors have created a timeline which captures the performance evaluation models and how the models evolved over time. This timeline is illustrated by Figure 1.

**Figure 1: Developments in performance assessment**



Source: Yadav, et al. (2013)

Early 19th century models for performance measurement and evaluation were considered forms of traditional management accounting and cost accounting. Experience in cost management has shown this to be inadequate and misleading, as it was simultaneously

monitoring the costs of products, activities, processes and quality. Performance evaluation focused on process management in isolation (Bititci, 1994; Yadav et al., 2013).

New findings led to the creation of the ROI model by the Du Pont Corporation. The development of ROI led to the pyramid of financial ratios which are still widely used as a diagnostic tool to measure the financial health of a company. Over time, this has already been seen to not be entirely satisfactory, since it did not point to indicators leading to continuous improvement in activities, something which is required in today's competitive environment.

Subsequently, the Tableau de Bord model was introduced. This stressed the importance of the relationship between financial and non-financial measures. The principle of this model is to focus on daily business operations and not pay too much attention to strategic issues (Epstein, Manzoni, 1997).

Other concepts should support the importance of complementary aspects of performance with respect to accounting (i.e., due to financial and accounting measures): Social accounting, strategic management accounting, ABC, Sarbanes-Oxley Act.

With the creation of the EFQM model, which was awarded the National Quality Award, the assessment of performance was evaluated according to quality and excellence, which can also be seen as a measure of higher performance, due to the quality and reliability of its products (Yadav et al., 2013).

The revolution in performance evaluation, however, came about with the introduction of the BSC by Kaplan and Norton in 1992. This proved to be complementary to a financial measure that, when evaluating performance, is also engaged in operational and strategic processes. Kaplan and Norton identified financial performance as a lagging indicator which depends on the performance of primary main factors (customer satisfaction, quality, innovation, excellence and improvement activities). The integration of non-financial criteria, such as quality, innovation, strategic orientation, human resources, in the traditional financial evaluation has brought the prospect of the integration of performance management, an important stage in this revolution in the performance of enterprises (Yadav et al., 2013; Paladino, 2007).

Over time, performance evaluation has affected the sustainability of enterprises, their impact on society and the environment. Economic growth, social progress and environmental "health" led to the concept of the Triple bottom line, a framework for assessing and reporting corporate performance according to economic, social and environmental parameters (Elkington, 1997). It emphasizes that profit is not the only concern of an enterprise; environmental and social obligations are also major driving factors in achieving higher performance.

It can thus be seen that there are a range of development models and concepts for the evaluation of performance. Companies must choose the model or concept that best corresponds with their activities and focus and which can assess performance based on those factors important to the company.

Timeline models have been presented as having changed and improved over time. As for their use and their popularity, this can be illustrated by the following table, which shows, based on research by Bain & Company, the ten most-used management tools. Table 1

shows the ranking for the last two reporting periods, i.e. 2010 and 2012 (the company has conducted research since 1993). These tools also illustrate some of the models which were represented on the timeline (Bain & Company, 2012).

**Table 1: Top 10 Management Tools**

Rank	2010	2012
1.	Benchmarking	Strategic Planning
2.	Strategic Planning	CRM
3.	Mission and Vision Statements	Employee Engagement Surveys
4.	CRM	Benchmarking
5.	Outsourcing	Balanced Scorecard
6.	Balanced Scorecard	Core Competencies
7.	Change Management Programs	Outsourcing
8.	Core Competencies	Change Management
9.	Strategic Alliances	Supply Chain Management
10.	Customer Segmentation	Mission and Vision Statements

*Source: Bain & Company (2012)*

Katic et al. (2011) continue to address the issue, considering the most widely used performance models to fall into two groups:

- Models which emphasize self-assessment – e.g. the EFQM model. This model helps the company find areas in which it can continue to improve (self-assessment within the company), but also allows comparison with competitors (benchmarking). Some authors believe that there is currently much evidence of the successful application of EFQM or other similar models, fulfilling the principles of TQM (Total Quality Management), providing significant economic and social effects for the organization (Marinič, 2008).
- Models designed to support the management and improvement of business processes – such as the performance pyramid or BSC.

Katic et al. (2011) consider the main feature of these models to be linked to corporate strategy and the development of non-financial indicators. The current situation entails a need to consider corporate strategy as a causal chain of causes and consequences.

A critical evaluation of models of corporate performance has been made by Vouldis and Kokkinaki (2011), and many models were also identified by Franceschini et al. (2007). These authors, through the analysis of existing models, define the following models of corporate performance:

- Balanced Scorecard;
- EFQM;
- ISO 9001:2000;
- Performance Prism;
- Six Sigma;
- Tableau de Bord.

### **Tableau de Bord**

Tableau de Bord is mainly used when evaluating a company's management. This concept is not only focused on financial indicators, but also addresses the issue of objectives, since vision and mission are translated into a set of objectives, of which the key success factors are identified and subsequently converted into a series of quantitative key performance indicators. The principle of this model is to focus on daily business operations and not pay too much attention to strategic issues (Epstein, Manzoni, 1997; Watts, McNair-Connolly, 2012).

### **EFQM**

This model is considered one of the most sophisticated and complex tools for the permanent and systematic improvement of business performance. Great emphasis is placed on its results, including financial ones. The model is structured into nine basic criteria, five of which are tools (techniques) that the firm should implement to maximize results and the remaining four results that determine what the firms have achieved (Watts, McNair-Connolly, 2012; Nenadál, 2004). The main principle is the achieving of excellent results in several ways that are acceptable to corporate management and support its strategy. This model comes from Nenadál (2002) and is based on the principles of Total Quality Management (TQM), which incorporates the following elements: customer focus, continuous improvement, participatory, social consideration.

### **Balanced Scorecard**

Balanced Scorecard reflects many of the attributes of the other guest models, and in the context of performance evaluation is based on vision and strategy. The model was based on the realization that no performance indicator can capture the whole complexity of the undertaking and its impact on the surrounding area. Balanced Scorecard translates the strategy into objectives which are part of performance measurement under the four following perspectives: financial, customer, internal business processes, and learning and growth. The basis of this model is that businesses use a balanced set of measures, which includes performance in terms of financial and non-financial measures (Yadav et al., 2013; Watts, McNair-Connolly, 2012). The result of the application of BSC should therefore be sustainable business growth in line with the strategy defined by top management, wherein the short-term financing of success is not something that will reduce investment in longer-term factors necessary for growth and the effective functioning of the company. Because this is a very complex method of strategic management, it is very popular, especially for large companies that can afford it financially and carry it out in-house (Kaplan, Norton, 2002). At the same time, Vouldis and Kokkinaki (2011) add that it is possible to take advantage of this comprehensive model at different levels across the organization, services, team or group.

## **Six Sigma**

Six Sigma is a business management strategy, originally developed by Motorola, the main tools of which include measurement and statistics. This model aims to identify and remove causes of errors in the processes of production and trade, and uses the DMAIC methodology. The Six Sigma process starts with the customers and the goal is the maximum satisfaction of their requirements. It is therefore necessary to trim off everything not directed towards this goal. Enterprises provide specific instructions on how to avoid errors in all activities (from order to final expedition). Six Sigma provides a comprehensive methodology for performance measurement processes and its improvement (George, 2010). To introduce the concept of Six Sigma to the management of the company, eight assumptions should be agreed upon:

- The continuous improvement of processes;
- All activities of the company are composed of processes;
- Senior management support;
- The determination of priorities, the expansion of the competence of employees, support for the involvement and teamwork of employees;
- Continuous assessment of the performance of the process;
- The effort to approach statistical indicators, including for those persons who do not have a very positive relationship with statistics;
- It is important to identify the subject of the measurement and the method of measurement;
- Work teams within the Six Sigma area are usually smaller groups of people interested in a particular problem, with the support of its leadership (Töpfer, 2008).

Vouldis and Kokkinaki (2011) further focus on the basic principles of this model, and argue that it should do the following: measure key processes and customer requirements with business goals, the creation of the standards of the measurement system, defining the relevant indicators, providing training in the field of project management and the Six Sigma model, defining objectives, flexible teams for the improvement of quality and profitability and the reduction of time and waste.

## **Performance Prism**

The Performance Prism system is presented in the form of a three-dimensional model in which each of the parties express viewpoints from which the undertaking is measured, based on the Balanced Scorecard model, which represents the first generation of performance measurement frameworks. As one of the performance measurement systems, the second generation, compared to the first generation, incorporates the wishes and needs of all stakeholders (Vouldis, Kokkinaki, 2011). Performance Prism integrates stakeholders in terms of five aspects – the satisfaction of stakeholders, post stakeholders, strategy, skills and processes. In the long term, the firm assesses the financial perspective set of entities (Neely et al., 2001).

### **Performance measurement from a macroeconomic perspective**

In all international comparisons of competitiveness and economic performance, gross domestic product (GDP) is a commonly used indicator, in terms of the statistical output of the System of National Accounts. GDP is considered a partial restriction in the evaluation of economic performance; there is also the issue of depreciation (amortization), taking into account “household” production, the issue of measuring the value of public goods and capturing qualitative changes in products and services. Major limitations are questions related to the sustainability of economic growth and prosperity, including: the excessive extraction of natural resources, environmental degradation and the effect of free time (Hronová, et al., 2009).

In recent years, performance has been specifically associated with sustainability, i.e. it also takes into account the social and environmental component, as complementary factors of economic performance. Sustainability should be seen as a dynamic relationship between the flow able and state variables. The intensity of the current use of resources should be such that the final state of these resources allow future generations the same opportunities for growth and prosperity. Resources should be spent excessively, i.e., to destroy intergenerational equity. The net national product should be modified to fit the maximum sustainable value, it should allow the same level of consumption today as in the future (Nečadová, 2012; Osberg, Sharpe, 2002).

With higher performance, the company will contribute more to GDP growth, which is desirable for any economy, because not only can companies improve quality, the quantity and cost aspects of their inputs, but they can act as a driving force for not only economic but also social development.

### **III. Materials, Methods and Results**

The basis of the empirical research was a questionnaire prepared as part of the doctoral thesis of the author. For the purposes of the author’s research, businesses were selected which met the following two conditions:

- Registered economic companies from section J (CZ-NACE) – Information and Communication Activities in the Czech Republic;
- Enterprises with > 250 employees.

A basic sample was made of 56 companies who received the questionnaire. In total, 32 out of the 56 companies answered (effectiveness was almost 57.14%). In terms of identification, it can be significantly statistically evaluated which types of legal form predominated: joint-stock companies (43.8%) and limited liability companies (56.3%). The question of business performance is which performance appraisal system is used in the specified companies.

In relation to the identification of areas and selected systems performance evaluation, the following statistical hypothesis was established:

**Statistical hypothesis:** “*The legal form of the company does not affect the choice of how to evaluate the performance of the company.*”



It has been suggested that the chosen legal form of the business has no effect on the system performance of enterprises. To verify this hypothesis, answers to the following questions were used from the questionnaire: “The legal form of your company.” and “What business performance evaluation system is used in your company?”. For the basic test of mutual dependency, the chi-square test of independence was used, null hypothesis  $H_0 : \pi_{ij} = \pi_{ij,0}$ , which states that random variables are independent against the alternative hypothesis  $H_1$ .

- $H_0$ : There is no relationship between the legal form of a business and its enterprise performance evaluation system.
- $H_1$ : There is a relationship between the legal form of a business and its enterprise performance evaluation system.

In this case, the dependence is upon two nominal variables (contingency). The basis for the detection of this dependence is the chi-square test of independence, the result of which is shown in Table 2. The output was obtained using IBM SPSS Statistics software.

**Table 2: Calculation of  $\chi^2$  test of independence for Statistical Hypothesis**

	Test criterion	The minimum level of significance
Chi-square	4.107	0.534
Likelihood ratio	5.241	0.387

*Source: Own research*

The resulting value of the minimum level of significance was tested at a 5% significance level ( $\alpha = 0.05$ ). If the resulting value is less than or equal to  $\alpha = 0.05$ ,  $H_0$  is rejected. Based on the calculation, it was found that the value of the Pearson chi-square statistics was 0.534. This result is greater than the chosen significance level ( $0.534 > 0.05$ ). In this case, therefore,  $H_0$  is not rejected at the 5% significance level, while  $H_1$  is rejected.  $H_0$  thus remains, as there was a failure to refute the hypothesis because it has not been demonstrated that there is a relationship between the choice of the legal form of business and the chosen system of evaluating the performance of the company.

⇒ Statistical hypothesis confirmed.

In the sample of enterprises, it makes no difference matter whether it is a corporation or limited liability company and thus this fact does not affect whether the focus is on classic or modern systems performance assessment. It certainly would be interesting if the relationship between these two variables were to be confirmed. Due to restrictions on large businesses, it could not be determined whether there is any difference between small, medium and large businesses.

Currently, debate continues as to whether companies are proponents of traditional evaluation methods of economic performance, or are already using some of the modern or comprehensive approaches to performance assessment.

Based on the research, financial indicators still dominate in these large companies, or companies plan to compare actual conditions. A total of 13 companies out of 32 monitors and evaluates economic indicators, while only about 12 companies compare the actual

status of the specified plan. Third, the most commonly reported system was benchmarking, which was used by three out of 32 companies.

The simplicity and clarity of these approaches cannot be denied. The EVA indicator is taken to be the epitome of modern indicators, but again it can be shown that businesses do not use it more, because 46.9% of them said that this indicator is not tracked, but that they are possibly contemplating its use. These results are also supported by studying the annual reports by the author; the data usually mentioned are economic in nature. Many businesses also point out the way in which they met or deviated from the established plan, which is usually expressed in terms of goal-oriented sales, profits and market share.

#### **IV. Discussion**

After analysis of the trends of the performance measurement system frameworks, an attempt is made here to classify these frameworks on the basis of some broad themes according to Yadav et al. (2013).

##### **1. Classical and dominant PMM frameworks**

This theme includes those frameworks that have been very popular in literature as well as predominantly used by practitioners. Their contributions to the knowledge base are related to the incorporation of non-financial performance measures, quality, self-assessment and the inclusion of most of the stakeholders. These can be listed as follows:

- Balanced Scorecard;
- Performance Pyramid;
- EFQM – excellence model;
- Performance Prism.

##### **2. Holistic and integrated PMM frameworks**

As discussed, to fulfill the need for a holistic and integrated framework for company performance, researchers have highlighted the following developments, which primarily discuss aligning performance with the future, bringing individual performance in line with enterprise performance, and integrating operational, functional and strategic aspects of enterprise performance:

- Consistent PMS;
- Integrated dynamic performance measurement system;
- Dynamic performance measurement system;
- Integrated performance measurement framework;
- Dynamic multi-dimensional performance framework;
- Holistic performance management framework.

### **3. Frameworks updating BSC approach**

There has been a very wide discussion in the literature about incorporating and updating the BSC approach, bearing in mind the organizational view, system dynamics methodology and modelling, fuzzy cognitive maps, intellectual and social perspectives, etc. The frameworks that update the BSC approach can be listed as:

- Kanji's Business Scorecard;
- Holistic Scorecard;
- Total Performance Scorecard;
- System dynamics based BSC;
- Proactive BSC.

### **4. Context-specific PMM frameworks**

This category includes frameworks discussing the specific contexts of performance, such as economic value, social values, quantitative factors, performance value chain, etc. These PMM frameworks can be further clustered on the basis of underlying driving factors, as process-based frameworks (input-process-output-outcome framework, the performance planning value chain); financial performance drivers (shareholder value, economic value added); criticism of traditional control mechanism (beyond budgeting). Context-specific frameworks are:

- Measures for time-based competition;
- Economic value added;
- Input-process-output-outcome framework;
- Shareholder value;
- Quantitative models for performance measurement systems;
- The action-profit linkage model;
- Beyond budgeting;
- The performance planning value chain.

### **5. Recently developed PMM frameworks**

These include those frameworks developed in the last three to four years and which take into account major issues related to enterprise performance, such as:

- Flexible Strategy Game-Card;
- Sustainability performance measurement system.

The question is just when evaluating the performance of these models will be used in the activities of Czech enterprises, consistently focused as they are on classical ways of evaluating their performance.

## V. Conclusion

This paper gives a comprehensive view of existing performance management frameworks. The shift from financial measures to integrated measures, operational perspectives to strategic perspectives and consideration of a set of stakeholders to all stakeholders have been the major visible changes.

The aim of the article was to define and categorize the development of concepts of performance measurement over time. Companies are able to create a comprehensive performance evaluation system that measures more than just economic indicators and thus can assess how strong the company is overall. Complex assessment of the company is much better and more effective than individual performance measurement. The reason for this is mainly the fact that only some indicators are directly measurable and comprehensive evaluation is necessary in order to take into account both indicators of long- and short-term performance.

The sector of Information and Communication activities is dominated by classic performance measurement systems (financial evaluation) and the simplicity and clarity of these approaches cannot be denied. Important in the management of business entities are objective values, as determined by the owners of the company, but the strategic success of the entity also increasingly affects its customers and employees. It is therefore a “necessity” to also include non-financial indicators when evaluating the performance of the company, but that does not mean that conventional approaches to performance evaluation are losing their importance. It is increasingly possible to hear discussion about human capital crucial for future growth, such as sustainability and developments not only in this sector.

Researchers in the field of performance measurement and management need to look beyond the scorecard and utilize these avenues of research to develop holistic, integrated, dynamic and effective PMSs that can help an enterprise to compete and succeed in turbulent and competitive business environments.

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