



4th World Conference on Business, Economics and Management, WCBEM

## Business process performance measurement under conditions of business practice

Roman Zamecnik<sup>a\*</sup>, Rastislav Rajnoha<sup>b</sup>

<sup>a</sup> Tomas Bata University in Zlin, nam. T. G. Masaryka 5555, Zlin 760 01, Czech Republic

<sup>b</sup> Tomas Bata University in Zlin, nam. T. G. Masaryka 5555, Zlin 760 01, Czech Republic

---

### Abstract

The paper focuses on the presentation of selected research results related to business process performance measurement carried out in Czech and Slovak enterprises during the period of 2007-2014. There is an emphasis on intermingling and seeking out of mutual associations between theoretical presumptions, previously resolved projects, and realistic observations based on the outcomes of the research conducted and the methodology used. The theoretical part of the paper provides a detailed characterisation of the current state of affairs regarding the investigated performance measurement issue. The following part of the paper defines the basic research methodology and expected contributions of the study. The aim of the paper is also to analyse and synthesize findings regarding the chosen, mainly not traditional methods and models, which have started to be used for business process performance measurement in managerial practice recently. Alternatively, some of them are only been thought of being used in practice in the future. In the final part of the paper, results of the survey are introduced and confronted with those arising from professional studies carried out especially in Germany, Austria and the U.S.A. The results and outcomes of our research studies have confirmed the old saying "What cannot be measured cannot be managed".

© 2015 The Authors. Published by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Peer-review under responsibility of Academic World Research and Education Center

*Keywords:* Business process management, controlling, performance management, performance measurement;

---

### 1. Introduction

The traditional heavily financially-oriented management concept that predominantly works on the basis of numerical figures and on the balance sheet and accounting statements is being faced by an ever-growing degree of criticism both by academic scientists and working practice. This criticism is directed towards many differing aspects.

---

\* Roman Zamecnik. Tel.: +00420-576-032- 528; fax: +00420-576-032- 658  
E-mail address: [zamecnik@fame.utb.cz](mailto:zamecnik@fame.utb.cz)

Apart from the neglect of non-monetary indices, it points up among others, the lack of inter-linkage with strategic planning, its overly-dependent orientation on the past and on the short-term, its woefully insufficient orientation on the customer, and incorrect index points for incentives (e.g. Neely et al., 1996; Bititci et al., 2005; Tucek, Tuckova and Zamecnik, 2009; Pavelkova and Knapkova, 2011).

Based upon these deficits, the end of the nineteen-eighties saw the first attempts to create new concepts. Professional literature written in English in the fields of Controlling, Managerial Accounting and Management began to use the term "Performance Measurement" in order to describe conceptual new beginnings as well as the use of these new concepts and indices for the management of enterprises. Currently, we are seeing the growth in significance and emphasis of a range of new success factors – for the time being, under-used in Controlling, which are mutually interlinked and inter-dependent (these are above all the following: quality, time, costs and customer satisfaction – i.e. utility). Even Czech and Slovak enterprises are beginning to increase their efforts directed at the systematic management of these factors. Performance Measurement tools can be successfully applied to the resolution of the above-mentioned problems. For this reason, this paper is oriented on the presentation of selected research results oriented on the measurement of business process performance in Czech and Slovak enterprises. The outcomes of our research studies investigation are concurrently confronted with those arising from professional studies conducted above all in Germany, Austria and the U.S.A.

## 2. Literature review

The research conducted by Franco-Santos et al. (2007) revealed that after reviewing 300 documents focusing on the issue of performance measurement and management of enterprise and its processes (journal articles, books, conference papers) only 17 definitions of corporate performance measurement were found. This fact clearly points to inconsistencies in the definition of this important tool of corporate management. The aim of the introductory part of the paper is therefore to analyze the approaches of professionals dealing with this issue.

The term "Performance Measurement (Business Performance Measurement, Corporate Performance Measurement or Enterprise Performance Measurement)" means the creation and use of usually several indicators of various dimensions (e.g., cost, time, quality, innovation capacity, customer satisfaction), which are used to assess effectiveness and efficiency of the performance and performance potentials of different objects in the enterprise, the so-called levels of performance (e.g., organizational units of various sizes, staff, processes), as indicated, e.g., by Reiss (1992), Neely et al. (1995) and Gleich (1997).

The term Performance Measurement thus indicates methods for performance measurement and evaluation, which through the use of multidimensional scales help to assess the effectiveness and efficiency of performance and performance potentials of different objects in the enterprise (Sujova, Rajnoha and Merkova, 2014).

Based on a critical literature review, we identified the following most frequently used methods and performance management and measurement tools (Young and O'Byrne, 2001; Neely et al., 2002; Gleich, 2002; Strack and Villis, 2002; Tangen, 2004; Wulf and Hoboken, 2006; Neely, 2007; Rajnoha and Dobrovic, 2011; Zamecnik, 2012 and others:

- Management Accounting (based on the traditional absorption costing and alternative variable costing),
- Process management accounting method (including the concepts of ABM, ABC, ABB),
- Controlling,
- Classical financial performance indicators (especially indicators of the absolute value of earnings, cash flow and profitability indicators),
- Balanced Scorecard (BSC),
- Total Quality Management (including the concepts of European Foundation for Quality Management (EFQM), Malcolm Baldrige National Quality Award, Six Sigma, Benchmarking),
- Value Based Management (VBM),
- Theory of Constraints,
- Business Process Reengineering,
- Lean Production (including JIT and Kanban concepts).

German authors, e.g., Gleich (2002) supplement these methods with additional methods, such as: Data Envelopment Analysis, Tableau de Bord, Productivity Measurement and Enhancement System (PROMES),

Performance Measurement Model, Quantum Performance, Performance Pyramid, Du Pont Indicator System, ZVEI Schema, Ernst & Young Concept, Business Management Window, JI Case Concept, Caterpillar Concept, Honeywell Micro Switch Concept, etc.

In the literature, there are gradual attempts to link the selected management and performance measurement concepts (e.g., Kaplan and Norton, 1996; Young and O’Byrne, 2001); however, the issue is not addressed from the perspective of comprehensive and systematic theoretical and methodological solutions.

### 3. Research objectives and used methodology

This paper sets out to present selected results and outcomes of three following research studies oriented on the mapping of the current situation in the field of activity performance measurement using Controlling in Czech and Slovak enterprises during the period of 2007 - 2014.

Our first research study (2007 – 2008) was oriented on encouraging and determining responses to questions which characterise the situation extant in the field of the evaluation the quality of the performance of the Controlling function in the enterprises we investigated. Our aim was above all to monitor the current situation regarding the given field of problems and issues in Czech and Slovak enterprises and, at the same time, equally to discover the potential opportunities, possibilities and interest of those questioned regarding their future implementation in the business practices of these enterprises.

The research study we undertook sought for answers to the following basic questions:

- What is the current state of affairs pertaining in the fields of performance measurement and evaluation and the optimisation of the Controlling processes in the everyday practices of Czech and Slovak enterprises?
- Is the measurement and evaluation of the enterprise’s process ranked as one of the fundamental tasks of the enterprise’s Controlling activities?
- What indices can (best) be used to realise such measurement and evaluation activities?
- Does Performance Measurement (i.e. Controlling) contribute to growth in the enterprise’s value?
- If yes, how and in what ways can this contribution be quantified?

The research study took place in two phases – the quantitative and the qualitative. Herein below, we will outline the results and outcomes of the quantitative phase.

In order to be able to create a sample, we used a technique based upon the Random selection Method – i.e. a targeted selection. While the random selection method does not guarantee in and of itself the true representative nature of the sample, and also makes generalisation on the basis of the attained results more difficult – it is, in essence, the only way to acquire certain “sensitive” data. This research study included individuals or enterprises of other organisations that the researchers considered to be suitable for the purposes of this research study.

The user data-base of the company - Controller-Institut, Contrast Consulting Praha, spol. s.r.o (Prague, Co. Ltd.) was used for the purpose of identifying and selecting appropriate respondents. This database was deliberately chosen with a view to the character of the problems and issue to be resolved and to the narrowly sector-specificity of the investigative questionnaire – which presupposed (counted on) the existence of a Controlling department within the enterprises and organisations under investigation and which this database guarantees. The people addressed by our questionnaire were the Heads of the Controlling

The questionnaire was sent out to all of the above-mentioned 748 enterprises and organisations. We received 59 completed questionnaires. Relevant data for quantitative investigative purposes was contained in 56 of these questionnaires. Therefore, the so-called “return rate” amounted to not quite 8 %. We can therefore classify this as being a very low response rate. It is however necessary to take the very narrow orientation of the questionnaire into consideration as well as the “sensitivity” of the data under investigation. Were we to compare this response rate with similar research studies in the field of Controlling either in the Czech Republic or in Germany or Austria, we would begin to see the achieved rate in a somewhat different light. The Controller – Institut company shows a response rate of about 10 % for similar research it has conducted. Eschenbach (2004), mentions a response rate for research conducted in the field of Controlling in German-speaking countries for the period 1976 – 1993. This was within the range of 7 % to 47 %. These research studies were however much more general in their character and nature.

The actual subject of our first research study was therefore the 56 Czech and Slovak enterprises and organisations who filled in and returned our questionnaire and which were part of the Controller-Institut, Contrast Consulting

Praha, spol. s r.o. 's database.

Very similar research was performed during 2009 – 2011. In that time, the one of authors was a research team member of the grant project GACR 402/09/1739 (The Creation of a Model for Measurement and Management of Company Performance). Within the project an extensive questionnaire survey was carried out which was attended by 402 companies from the whole Czech and Slovak Republic. The outcomes consist of the ways how enterprises measure and manage their performance and of the level of their satisfaction with the concepts used for performance measurement and management. The structure of the questionnaire was focused on the same objectives as in 2007 – 2008.

The achieved research results were further compared with results of the following surveys carried out abroad, for example:

- The study "Business Performance Management: Current State of the Art" was prepared by Bernard Marr (2003) based on the results from the questionnaire survey that was performed in 2003. Within the survey, data from 780 large U. S. companies were obtained. This study responded to the fact that only a few reliable studies have documented the status, common practices and benefits of corporate performance measurement.

The main goal of the third stage of our research (2012 – 2014) was to analyse the utilization rate of traditional and modern indicators, methods and models of an enterprise performance. This was done on the sample of randomly chosen enterprises and organisations in various industrial branches of the Czech and Slovak Republic. Based on the relevant mathematical and statistical methods, we are to identify causally subsequent connections and then determine their impact on a enterprise performance reached.

For the purpose of research, also due to the goals set, we decided to collect the data and information needed through an extensive on-line research questionnaire. In total, more than 1,500 enterprises and organisations were addressed via e-mail or phone communication, and above all by means of a directive interview. In the end, 164 enterprises and organisations filled in the questionnaires that were subsequently examined. Rather low rate of return is caused by the unwillingness of business entities, their negative attitude and scepticism regarding economic trends, lack of time, low interest and the like. Even though, we consider the research sample of 164 enterprises and organisations relevant with having a sufficient indicator value.

Data from three questionnaire surveys has been analyzed in the research in order to get better and more accurate results and also because of a need to compare the evolution of the researched indicators. Table 1 shows the structure of statistic file.

When classifying businesses according to their sizes, the recommendation of European Commission 2003/361/EC dated 6 May 2003 (plus taking into account its modification from the year 2005) was used. The stated characteristics regarding the size of businesses (see Tab.1) fully correspond with the research goal focusing on small and medium- sized enterprises mainly (having annual turnover up to 50 million EUR).

Table 1. Structure of the researched enterprises

YEAR/ENTERPRISE CATEGORY	TOTAL	RELATIVE
2007-2008		
Micro	5	8,93 %
Small	16	28,57 %
Medium	17	30,36 %
Large	18	32,14 %
2009-2011		
Micro	40	9,95 %
Small	109	27,11 %
Medium	144	35,83 %
Large	109	27,11 %
2012-2014		
Micro	36	21,95 %
Small	85	51,83 %
Medium	21	12,80 %
Large	22	13,42 %

#### 4. Results and discussion

This section contains the results and outcomes of our evaluation of the introductory part of the questionnaire, which were targeted on the discovery of the basic areas requisite for the successful measurement and subsequent evaluation of the performance of an enterprise's activities (i.e. of its Controlling) processes. The intent was to discover whether the enterprise/organisation in question applied Process Management techniques, evaluated its processes with the aid of pre-defined indices, what measurement and evaluation tools it used for the measurement and evaluation of their performance, etc.

Table 2. Evaluation of Question № 1 in the questionnaire

	YES	NO
a) Has your company created a (complete) list of all of its processes?		
b) Are all of its activities a component of one of these company processes?		
c) Does each company process have its own defined indices, by means of which this process is measured and evaluated?		
d) Is there a set periodicity to the recording of the values of the given indices?		
e) Has responsibility for the evaluation of the given indices been allocated/defined?		
f) Have correctional measures been set in place to counter exceeding the set values for these indices?		
g) Does data regarding the cost of company processes exist for the last accounting period?		
h) Does company performance evaluation serve as the basis for its improvement?		

The first question in the questionnaire had a general orientation on the use of Process Management in the companies being analysed. This question is composed of a total of eight sub-questions (1a – 1h, see Table 2 above). In the course of the statistical evaluation, consideration was taken of the size of the company in question (1 – micro-enterprise, 2 – small enterprise, 3 – medium-sized enterprise, 4 – large-scale enterprise). This form of designation was used throughout the questionnaire for all of the other questions.

The results and outcomes of the analysis of the first question are presented with the aid of Table 3, which only depicts a summary of the values for the whole multiple of the enterprises/organisations under investigation (i.e. the mean values for the individual sub-questions and the size of the enterprises/organisations are designated for their positive response).

Table 3. Relative frequency of responses – Evaluation of Question №. 1

Sub-question:	Size:				Overall Average:
	1	2	3	4	
1a	0.60	0.50	0.76	0.64	0.63
1b	0.80	0.31	0.65	0.72	0.59
1c	0.60	0.25	0.53	0.39	0.41
1d	0.60	0.50	0.82	0.72	0.68
1e	0.60	0.50	0.76	0.83	0.70
1f	0.40	0.31	0.59	0.72	0.54
1g	0.40	0.50	0.71	0.78	0.64
1h	0.60	0.63	0.94	0.89	0.80

As is clear from Table 3, 63 % of the analysed enterprises/organisations have already created lists of all of their company processes. 59 % of the v questioned indicated that all of their activities are components of some other process. Despite this fact however, only in 41 of these enterprises/organisations has each of these company processes been allocated a defined index by means of which these processes are measured and evaluated. 68 % of these enterprises/organisations regularly record the values of the given index, and for 70 % of these enterprises/organisations, responsibility for the measurement and evaluation has also been allocated. 54 % of the

enterprises/organisations we investigated set corrective measures for cases where the set values of a given index have been exceeded. The costliness of a given process is tracked in 64 % of these enterprises/organisations, and for 80 % of them the measurement and evaluation of its processes serves as the basis for their improvement.

The process survey was repeated in 2011 with the following results: 41% of enterprises in the Czech and Slovak Republic have a defined indicator for each business process by which they measure and evaluate. It was confirmed that larger enterprises have more often defined indicators to measure the effectiveness of the business process (large enterprises have defined indicators in 48%, medium in 45%, small in 36% and micro in 24%). 59% of enterprises in the Czech and Slovak Republic have the periodicity to record values of the given indicator and defined responsibility for the indicator evaluation. Again, it was confirmed that recording values and responsibility is defined more frequently in larger enterprises. Roughly half the enterprises have established corrective measures when exceeding the indicator. In this case, the corrective measures are often set by large enterprises (large enterprises 68%, medium-sized enterprises 59%, small enterprises 37% and microenterprises 19%). The process cost data are available in 69% of enterprises. The results are similar for small, medium and large enterprises, only in the case of microenterprises the knowledge of the process cost data is lower and reaches 48%. Evaluation of business processes is used in 73% for their improvement.

We would also like to mention that we will make use of the overall results of Gunther and Gruning's research study regarding the extent to which performance measurement systems (further PM systems) are in use in German and Austrian enterprises and organisations (the subject of this piece of research study conducted in 2000 was the 123 German and Austrian enterprises and organisations).

In 2000, 36 % of German and Austrian enterprises and organisations already made use of PM systems in their working practices, while 17 % of the enterprises and organisations were in the implementation phase of some sort of PM system. 15 % of the enterprises and organisations at the time were investigating the possibilities and opportunities of using one or more of these systems in their enterprises and organisations.

20 % of the investigated enterprises and organisations mentioned that they used another system for measuring and evaluating the performance levels of their processes. The most frequently mentioned were the ISO 9001 and 14001 norms and the EVA indices for value-added. Furthermore, enterprises and organisations usually make use of a set of their own specific indicators for these purposes. One of the enterprises and organisations we investigated indicated that it used the Variable Costs Method and the Surcharge/Mark-up Calculation Method (Gunther and Gruning, 2002)

The research conducted in 2009 - 2011 showed that the most common reason for the implementation of a system of performance measurement and management of enterprises in the Czech and Slovak Republic is strategic planning (average evaluation 4.11), a need for controlling (average evaluation 4.10) and motivation and remuneration (4.04). Significant factors for the implementation of the performance measurement and management system can be seen in the need for communication (3.84), daily decision-making (3.75) and strategy verification (3.59). Managing relationships with stakeholders (3.21) and statutory duty (3.23) are in terms of the importance of corporate performance measurement perceived as less important (evaluation scale: 1 - insignificant reason, 5 - very important reason).

In Marr's (2003) research, the most important reason for the performance measurement and management was the need of business management (30%), strategic planning (19%), daily decision-making (18%) and strategy verification (12%). Less significant reason for the performance measurement and management was communication (8%), motivation and remuneration (7%), managing relationships with stakeholders (3.5%), and statutory duty (2.5%).

In the third stage of our research (2012 – 2014), we present the selected results regarding financial performance of enterprises based on traditional and modern indicators of an enterprise performance. Each one out of 164 enterprises examined use some type of a traditional financial indicator, most often a combination of these. Out of all the enterprises, there are following numbers regarding the financial performance measurement. 139 enterprises (85%) measure it by means of various forms of profit, 90 enterprises (55%) by means of cash flow, and 58 enterprises (35.5%) by means of profitability. It is essential that each business entity monitors all these indicators together because each of the indicators assesses certain aspect of an enterprise performance (economy, solvency, etc.) This is the principal requirement regarding financial performance measurement. However, only 35 enterprises (21.5%) meet such requirement. As emerged from the research, the enterprises and organisations had followed, or at

least once had used the following modern indicators regarding financial performance:

- EVA – Economic Value Added
- MVA – Market Value Added
- CFROI – Cash Flow Return on Investment
- KPI – Key Performance Indicators

40 enterprises (24.5% out of all the enterprises) use the EVA indicator, 15 enterprises (9%) use the MVA indicator and 3 enterprises (2%) use the CFROI indicator. 1 enterprise uses the system of key performance indicators KPI. Due to various combinations, just 53 enterprises (32%) monitor, or at least once have used modern indicators of financial performance. 111 enterprises (68%) do not monitor any indicator at all.

We also examined whether it is possible to see any connection between monitoring modern indicators and return rate of capital employed. The group of enterprises with return of capital employed 7 – 10% (50%) has the highest proportion of monitoring the modern indicators, whereas in other groups this does not cause any significant changes. Even the group of enterprises with negative profitability shows a slightly higher proportion of using modern financial performance indicators (32%) than the group of enterprises with the highest return rate of capital employed which is more than 10% (31.5%). Regarding these results, it is not possible to draw any relevant conclusions.

## 5. Conclusion

Comparison of results of different field surveys has its advantages in comparing different researches and enriching discussion of results of individual researches. On the other hand, there are very serious difficulties arising from different samples of enterprises (their specialization, size, "age", etc.) within each survey. Another problem lies in different approaches to understanding the performance of companies, not only from the theoretical conception but also from the perception of the business managers themselves.

The outcomes of researches focused on performance measurement and management of enterprises in the Czech and Slovak Republic and their comparison with researches in the world confirm that although firms in the Czech and Slovak Republic have been gradually accepting a number of concepts and tools to measure and manage performance and are more familiar with them and apply them as well, the strong majority of their usage is still limited in comparison to the rest of the world. An important tool for the performance measurement and management in most companies are financial indicators. A number of especially large firms use outputs from the management accounting and controlling; a high utilization rate is also evident in quality management tools.

We further went on to generalise and state, that without a basic feedback mechanism, which is created by systems for the measurement and evaluation of enterprises and organisations performance and processes, no progressive form of management can exist or function – thus, not even the Controlling function, since the old saw: "What I don't (or can't) measure – I can't manage" still holds true and is generally valid.

## Acknowledgements

The authors are thankful to the Operational Programme Education for Competitiveness co-funded by the European Social Fund (ESF) and national budget of the Czech Republic for the grant No. CZ.1.07/2.3.00/20.0147 - "Human Resources Development in the field of Measurement and Management of Companies, Clusters and Regions Performance", which provided financial support for this research.

## References

- Bititci, U. S., Mendibil, K., Martinez, V., Albores, P., (2005). Measuring and managing performance in extended enterprises. *International Journal of Operations & Production Management* 25, 333–353.
- Eschenbach, R., (2004). Controlling. ASPI Publishing, Praha, pp.812.
- Franco-Santos, M., Kennerley, M., Micheli, P., Martinez, V., Mason, S., Marr, B., Gray, D., Neely, A., 2007. Towards a definition of a business performance measurement system. *International Journal of Operations & Production Management* 27, 784-801.
- Gleich, R., (1997). Stichwort Performance Measurement. *DBW* 1, 114-117.
- Gleich, R., (2002). Performance Measurement als Controllingaufgabe. *Controlling Fortschritte*. Verlag Valen, Munchen.
- Gunther, T., Gruning, M., (2002). Prakticka aplikace systemu mereni vykonnosti. *Controlling* 2, 3 – 8.

- Kaplan, R. S., Norton, D. P., (1996). *The Balanced Scorecard: Translating Strategy into Action*. Harvard Business School University Press Boston, pp. 336.
- Marr, B., (2003). *Business Performance Management: Current State of the Art (A Survey Report)*. Cranfield School of Management and Hyperion, Cranfield.
- Neely, A., Gregory, M., Platts, K., (1995). Performance measurement system design: A literature review and research agenda. *International Journal of Operations & Production Management* 15, 80–116.
- Neely, A., Mills, J., Gregory, M., Richards, H., Platts, K., Bourne, M., (1996). *Getting the Measure of Your Business*. Works Management, Cambridge.
- Neely, A., Adams, Ch., Kennerley, M., (2002). *The Performance Prism: The Scorecard for Measuring and Managing Business Success*. Financial Times Prentice Hall.
- Neely, A. D., (2007). *Business performance measurement, unifying theories and integrating practice*. (2nd ed.). Cambridge University Press, Cambridge.
- Pavelkova, D., Knapkova, A., (2011). *Mereni a rizeni vykonnosti podniku*. Linde nakladatelstvi, s. r. o., Praha.
- Rajnoha, R., Dobrovic, J., (2011). Simultanne riadenie ekonomiky a procesov znalost'ou pridanej hodnoty. *E + M – Ekonomie a Management* 14, 53–69.
- Reiss, M., (1992). *Mit Blut, Schweiss und Tranen zum schlanken Unternehmen*. gfmt (Hrsg.). Lean Strategie, Munchen
- Strack, R., Villis, U., 2002. RAVE: Integrated Value Management for Customer, Human, Supplier and Invested Capital. *European Management Journal* 20, 147-158.
- Sujova, A., Rajnoha, R., Merkova, M., (2014). Business process performance management principles used in Slovak enterprises. *Procedia Social and Behavioral Sciences* 109, 276-280.
- Tangen, S., (2004). Professional Practice : Performance measurement: from philosophy to practice. *International Journal of Productivity and Performance Management* 53, 726-737.
- Tucek, D., Tuckova, Z., Zamecnik, R., (2009). Business Process Management with Software Support. In K.S. Soliman (Eds.), *Knowledge management and innovation in advancing economies-analyses & solutions* 1-3, 1060-1073.
- Wulf, C.C., Hoboken, N.J., (2006). *CFO insights : enabling high performance through leading practices for finance ERP*. John Wiley & Sons, pp. 290.
- Young, S. D, O'Byrne, S. F., (2001). *EVA and Value-Based Management: A Practical Guide to Implementation*. McGraw Hill, New York.
- Zamecnik, R., (2012). Research on performance measurement under conditions of Czech enterprises. *7th International Conference on Accounting and Management Information Systems (AMIS)*. Book Series: Proceedings of the International Conference Accounting and Management Information Systems, 1353-1367.