

## MANAGERIAL INFORMATION SUPPORT FOR STRATEGIC BUSINESS PERFORMANCE MANAGEMENT IN INDUSTRIAL ENTERPRISES IN SLOVAKIA

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**Abstract:** In the area of business performance and strategic performance measurement system, many studies have been realized which identify the major factors affecting the performance of the company itself. The world of business environments in modern economies has changed dramatically the way of pursuing business and depends nowadays heavily on the performance in generating and utilizing new knowledge, information systems, innovations and management techniques and tools for creating of the higher business performance. From several studies carried out in the management and measurement performance issue, it is evident that performance is affected by many factors. These factors are important for improving business performance. The objective of this paper was to analyze selected management methods and tools that can potentially have an effect on the performance. The results of our empirical scientific study provide interesting and valuable findings that the overall performance of industrial enterprises in Slovakia. Relationship between the use of MIS and overall business performance ROE is a strong statistically significant. The use of the MIS achieved business performance of ROE between 2-10%. Enterprises that use only basic ERP Information System reach under-average business performance most often with negative or very low ROE to maximum 2%.

**Key words:** performance management, business performance, information system, Slovakia

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### Introduction

New approaches to corporate performance management which support traditional indicators have been preferred for some years. Many of them are devoted mutually to the cohesion of business performance with parameters such as corporate strategy, strategic decision making tools to support performance in the form of the Balanced Scorecard (BSC), system of key performance indicators (KPI), controlling and information support by Business Intelligence (Bisbe and Malagueño, 2012; Gimbert et al., 2010; Chenhall, 2005; Rajnoha et al., 2013), the effect of strategic performance measurement system of human resources and corporate results (Bento et al., 2014), the customer satisfaction in banking business

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and its importance for financial performance of commercial bank (Koraušet et al., 2015), the relationship between the distinctive capabilities and performance of food SMEs in a developing countries with an emphasis on the businesses considering strategic management concept (Mura et al., 2015).

SPMS allows enterprise to plan, measure and monitor its performance, such that making decisions, resources and activities can be better aligned with the business strategies to achieve the desired results and creating value for shareholders (Bento et al., 2014).

In our research we analyze the selected concepts of strategic business performance measurement and management. We focused on the use of selected methods of strategic performance measurement and management in various industries in Slovakia. The main aim was to find out key methods of strategic business performance measurement and management with positive effect in better overall business performance.

### **Literature Review**

According to Bento et al. (2014) the literature of performance management and measurement shows that SPMS can have a significant impact on overall business results. Recently, Bisbe and Malagueño (2012) found evidence that the effect of SPMS on organizational performance is reduced in situations where environmental dynamism is high. Petter et al. (2012) argued that information system success leads to improved company performance, while others have concluded that there is no relationship between information systems and performance measurement (Soudani, 2012). Van der Stede et al. (2006) provided intriguing evidence of the importance of including a diverse set of performance measures in the SPMS, finding that companies that used a higher number of performance measures actually achieved higher performance. According to the management control literature, the uses for which the SMPS are designed may have a significant influence in their outcomes (Chenhall, 2005) and Mouritsen (2005) has pointed out that the ability of management control systems to support change is influenced by system design. Non-financial indicators are considered as the drivers the future financial performance of the company. SPMS contributes to the achievement of strategic goals through three mechanisms: a better understanding of the links between different policy priorities, effective communication between the objectives and activities and the efficient allocation of resources and tasks (Dossi and Pateli, 2010; Štefko and Krajňák, 2013). Many other empirical studies realized around the world in recent years have also confirmed the relationship between strategic planning and business performance (Rudd et al., 2008).

In Slovakia or Czech Republic have been also addressed several research of this issue in the recent past, there may be mentioned e.g. research of the SPSM and BSC methodology application in business practice. Štefko et al. (2012) analyzed the prices as a key competitive factor in the steel industry in Slovakia and Poland

(Štefko et al., 2012). Similar study is dedicated to the issue of the process performance measurement in Czech companies (Tuček et al., 2013). The next survey realized in Czech Republic was focusing on the evaluation the impact of the use of BSC in order to achieve greater financial performance of businesses, depending on the size and business sector on a sample of micro, small, medium and large enterprises. The research results also did not confirm that the BSC use contributes to improved financial performance of the company. In the research was used a sample of 167 enterprises (Knápková et al., 2014).

Another important foreign research, however, says that if the BSC is used primarily for strategic management, then it will also bring higher financial performance (Braam and Nijssen, 2004). BSC use that complements corporate strategy positively influences company performance, while BSC use that is not related to the strategy may decrease it. On that basis, we can conclude that strategic planning has a positive impact on business performance regardless of the sector in which it operates. Interesting empirical studies have Spanish authors who recently analyzed SPMS and its impact on business performance in terms of strategic planning and strategic decision-making (Bisbe and Malagueño, 2012). Similar research was focused on the relation between the use of SPMS and the quality of the strategic planning process and confirmed the positive relationship between the use and dependence SPMS and quality of strategic plans and company decisions (Gimbert et al., 2010). Most authors in their scientific studies states that SPMS can help businesses to define and achieve its strategic objectives, align behaviors and attitudes, and ultimately can have a positive impact on business performance. However, SPMS also can be criticized for a number of reasons, such as the promotion of inappropriate behavior of managers, suppression of innovation and learning, and so on (Micheli and Manzoni, 2010). The authors emphasize that strategic planning has the potential to produce positive effects on business performance in a highly unstable environment and planning is such an important value added for the company in terms of its higher performance (Brews and Purohit, 2007). For these studies it can be concluded, that regular use of the SPMS in company may favor the more comprehensive and elaborate system of strategic planning, which is further reflected in higher business performance.

Nowadays, Information systems knowledge is essential for creating successful, competitive firms, managing global corporations, adding business value and providing useful products and service to customers (Laudon and Laudon, 2007). Information technology and systems have tremendous impact on the productivity of both manufacturing and service organizations. Implementing the Balanced Scorecard, however, cannot be successful without the support of a high-quality business information system as, especially within a larger business, this concept will not function if not working with large amounts of data and information (Pivnička, 2011). Implementing a new information system is not always to the benefit of a company. The success of system implementation is dependent on many

factors (Ferenčíková, 2011). Higher-quality, lower-cost information is a key to unlocking more sources of finance for companies (Belás et al., 2016).

Constantly changing environment significantly affects the overall efficiency and so also the competitiveness of enterprises. One of the conditions to maintain the competitiveness and performance of the company is the ability to work properly and timely with information not only about past and present but especially about the future. ERP information system is a powerful tool that influences awareness, flexibility and performance of the company. Management of "today's" company is constantly forced to look for additional useful information especially about the future development. This task is currently being performed by ERP systems of II. development type (Basl and Blažiček, 2008).

The business impact of SPMS is affected by information technology variables (Internet usage, ERPs, informational technology tools) (Bento et al., 2014). Especially ERP II – BI (Business Intelligence) represents the system that provides the ability to analyze business information in order to support and improve management decision making (Elbashir et al., 2008). An effective BI system not only reduces the time used for decision-making by improving the various information processes and information quality, but at the same time aids in increasing the quality of strategic and operative planning (Singh and Samalia, 2014). BI systems have the potential to maximize the use of information by improving the company's capacity to structure a large volume of information and make it accessible, thereby creating a competitive advantage (Petrini and Pozzebon, 2009).

Organizations attempt to use knowledge in order to strengthen their competitiveness for both customers and employees (Singh and Samalia, 2014). BI is a system that turns data into information and then into knowledge thereby adding substantial value to firm's decision making processes because each manager has to deal with efficiency in decision making process (Tutunea and Rus, 2012; Singh and Samalia, 2014). The present tendencies are expanding worldwide due to three main directions: the globalization which implies increased international competitiveness, technological changes, organizational behaviour, ICT, knowledge, innovation are considered priorities (Szabo et al., 2013). Many organizations continue to increase their investment in implementing various types of information systems, such as Enterprise Resource Planning (ERP) and Customer Relationship Management (CRM), primarily because of the belief that these investments will lead to employees' increased productivity (Hou, 2012). Most businesses already have a solid market research capability that helps them understand their customers' needs and expectations.

### **Research Objectives**

To identify the relationship between selected strategic management tools and measuring overall corporate performance, we formulated the following research hypothesis:

- **H1:** It is expressed a presumption that overall business performance (ROE) will be affected by the use of certain methods of strategic business performance management.
- **H2:** We assume, that if industry companies use some management methods and tools to support strategic performance management, they achieve higher overall business performance ROE.
- **H3:** We assume, that if industry companies only use the basic IS ERP, they achieve lower performance compared to enterprises using a managerial IS.

### Data Collection and Methodology

There was created on-line questionnaire through internet application to build data collection of companies in Slovakia. In total 1.457 chosen businesses were asked to participate in the survey, representing selected industry segments in Slovakia.

Data about the primary database of 1.457 enterprises from selected industries of the Slovak Republic we received from information of various industrial associations and those we have subsequently supplemented by other companies on the basis of extensive online survey.

The initial data set consisted of all the surveyed firms (164 enterprises), out of which we created sets specifically aimed at firms from the industries of wood processing, engineering and automotive industry. Gradual growth of FDI inflows in the last two decades has led to the emergence and expansion of new industries. A good example is the automotive industry, which belongs today in Central Europe to the principal industries (Dudáš and Lukáč, 2015). A separate set containing all the enterprises from the three industries was also studied. The final two sets are defined by their core business (focus) – manufacturing, the last set also includes enterprises of trade and services.

To identify and analyze parameters for measuring and management corporate performance, a key indicator was the size of ROE. Based on this, we have incorporated the companies to the performance categories (6 intervals of scale), which are influenced by the lower frequency reduced to 3 respectively 2 performance enterprise categories. We realized that more appropriate indicator would be the indicator EVA, but for its determination it is necessary to know the costs of the own capital, which is in our conditions rather unrealistic. Therefore, we have used more accessible indicator ROE. In view of the sensitivity of the data we have scale a value of 0 % to over 10 %. Moreover we considered 6 % of ROE as the moderate value reached in surveyed enterprises.

The results obtained by questionnaire survey were processed by statistical methods, whereby we except of selected variables of descriptive statistics for one variable (frequency, relative proportions) used mainly Chi-square test of independence. If the value corresponds to the chi-square probability  $p > 0.05$  this means that the relationship between variables is not statistically significant, and vice versa, if  $p \leq 0.05$ , it is possible strength of the relationship between two variables tested using one of the contingency factors. The hypothesis was verified at the 5% significance

level ( $\alpha = 0.05$ ). For clear interpretation and relevant comparisons of the contingency coefficients of several analyzes we calculated adjusted contingency coefficient (Adj. CC).

### Research Results

Examination of the statistical relationships for each of the business researched are presented in Table 1, where we focused on statistically significant dependence resulting from the chi-square test (p-value <0.05). Table 2 shows, that we have found a statistically significant dependence on the use of Managerial Information System.

**Table 1. Managerial Information System - strategic tools with impact on overall business performance ROE**

Managerial Information System - Strategic Variable of Business Performance Management System	P	Adj. CC	Business Performance Categories - ROE					
			Group 0	Group 1	Group 2	Group 3	Group 4	Group 5
			ROE < 0%	ROE 0-2 %	ROE 2-4 %	ROE 4-7 %	ROE 7-10 %	ROE >10 %
All industries (164 firms)								
Managerial IS	0,02644	0,31	No	No	Yes	Yes	Yes	Yes

The Relationship between the use of Managerial Information System (MIS) and overall Business Performance ROE is a strong statistically significant. Residue levels (Table 2) showed that the use of the Managerial information System achieved business performance in groups of ROE 2-5, so the value of ROE is between 2-10%. The use of MIS significantly positive influence the overall business performance. Companies they use MIS, achieved above-average business performance ROE.

**Table 2. Pivot: The use of MIS x Performance – Frequency – All industries**

The use of MIS	Group 0 ROE < 0%	Group 1 ROE 0-2 %	Group 2 ROE 2-4 %	Group 3 ROE 4-7 %	Group 4 ROE 7-10 %	Group 5 ROE >10 %	Row total
<b>The observed frequency</b>							
MIS is not used	20	44	25	17	8	14	128
MIS is used	5	3	10	9	4	5	36
Total	25	47	35	26	12	19	164
<b>Expected frequency</b>							
MIS is not used	19,51220	36,68293	27,31707	20,29268	9,36585	14,82927	128,000
MIS is used	5,48780	10,31707	7,68293	5,70732	2,63415	4,17073	36,000
Total	25,00000	47,00000	35,00000	26,00000	12,00000	19,00000	164,000
<b>Observed minus the expected frequencies (residue)</b>							
MIS is not used	<b>0,487805</b>	<b>7,31707</b>	-2,31707	-3,29268	-1,36585	-0,829268	0,00
MIS is used	-0,487805	-7,31707	<b>2,31707</b>	<b>3,29268</b>	<b>1,36585</b>	<b>0,829268</b>	0,00
Total	0,000000	0,00000	0,00000	0,00000	0,00000	0,000000	0,00

As also resulted from our research, using the basic ERP Information System affects the overall business performance ROE. Residue levels (Table 3), however, leads to the conclusion, that companies that use only basic ERP Information System

reach under-average business performance most often with negative or very low ROE to maximum 2%.

**Table 3. Pivot: The use of ERP x Performance – Frequency – All industries**

The use of ERP	Group 1 ROE < 0%, 0-2 %	Group 2 ROE 2-4 %, 4-7 %	Group 3 ROE 7-10 %, >10 %	Row total
<b>The observed frequency</b>				
ERP is not used	39	48	21	108
ERP is used	33	13	10	56
Total	72	61	31	164
<b>Expected frequency</b>				
ERP is not used	47,41463	40,17073	20,41463	108,0000
ERP is used	24,58537	20,82927	10,58537	56,0000
Total	72,00000	61,00000	31,00000	164,0000
<b>Observed minus the expected frequencies (residue)</b>				
ERP is not used	-8,41463	<b>7,82927</b>	<b>0,585366</b>	0,00
ERP is used	<b>8,41463</b>	-7,82927	-0,585366	0,00
Total	0,00000	0,00000	0,00000	0,00

### Summary

Many of them are devoted mutually to the cohesion of business performance with parameters such as corporate strategy, strategic decision making information tools to support performance in the form of the Balanced Scorecard (BSC), system of key performance indicators (KPI), controlling and information support by MIS and Business Intelligence (Bisbe and Malagueño, 2012; Bento et al., 2014; Gimbert and Bisbe, Mendoza, 2010; Belás et al., 2016; Rajnoha et al., 2013; Van der Stede et al., 2006; Chenhall, 2005, Elbashir et al., 2008, Rajnoha et al., 2016). Most authors in their scientific studies states that SPMS can help businesses to define and achieve its strategic objectives, align behaviors and attitudes, and ultimately can have a positive impact on business performance. Petter et al. (2012), Bisbe and Malagueño (2012), Petrini and Pozzebón (2009), Rudd et al. (2008), Bento et al. (2014), Ranjan (2009) and other argued that SPMS and information system success leads to improved company performance, while others have concluded that there is no relationship between information systems and performance measurement systems (Soudani, 2012). Bisbe and Malagueño (2012) found evidence that the effect of SPMS on organizational performance is reduced in situations where environmental dynamism is high. SPMS also can be criticized for a number of reasons, such as the promotion of inappropriate behavior of managers, suppression of innovation and learning, and so on (Michelia and Manzoni, 2010). The authors emphasize that strategic planning has the potential to produce positive effects on business performance only in a highly unstable environment and planning is such an important value added for the company in terms of its higher performance (Brews and Purohit, 2007; Micheli and Manzoni, 2010).



The results of our empirical scientific study provide interesting and valuable findings that the overall performance of industrial companies in Slovakia. We have found a statistically significant dependence of Business Performance Management and Measurement System on the use of Managerial Information System. The Relationship between the use of MIS and overall business performance ROE is a strong statistically significant. The use of the MIS achieved business performance of ROE between 2-10%. On the other side, companies that use only basic ERP Information System reach under-average business performance most often with negative or very low ROE to maximum 2%.

So we recommend for enterprises to apply selected methods and models of strategic business performance management in different industries of Slovakia. By application of selected strategic methods and models such as managerial information systems it can be achieved a higher performance of companies.

Our research has been processed with the limitation in research sample size. Due to the lower return it was not possible to reach a larger number of enterprises, so research sample was 164 enterprises. We are also aware that assessing the overall business performance according the ROE indicator can be distorting. In our further research we will consider also using the indicator Earnings before interests, taxes (EBIT) and Earnings before interests, taxes, depreciation and amortization (EBITDA).

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**WSPARCIE INFORMACJI MENEDŻERSKIEJ W ZARZĄDZANIU  
WYDAJNOŚCIĄ STRATEGICZNEGO BIZNESU W PRZEDSIĘBIORSTWACH  
PRZEMYSŁOWYCH NA SŁOWACJI**

**Streszczenie:** W kwestii wydajności biznesu i systemu pomiaru wydajności strategicznej przeprowadzono liczne badania, które identyfikują główne czynniki wpływające na wydajność samej firmy. Świat środowisk biznesowych we współczesnych gospodarkach zmienił zdecydowanie sposób prowadzenia działalności gospodarczej i zależy obecnie w dużym stopniu od wydajności w generowaniu i wykorzystywaniu nowej wiedzy, systemów informacyjnych, innowacji i technik zarządzania oraz narzędzi umożliwiających osiągnięcie wyższej wydajności biznesu. Z przeprowadzonych badań dotyczących zarządzania i pomiaru wydajności wynika, że na wydajność ma wpływ wiele czynników. Czynniki te są ważne dla poprawy wyników biznesowych. Celem niniejszego artykułu była analiza wybranych metod i narzędzi zarządzania, które potencjalnie mogą mieć wpływ na wydajność. Wyniki naszych empirycznych badań naukowych dostarczają interesujących i cennych wniosków, dotyczących ogólnej wydajności przedsiębiorstw przemysłowych na Słowacji. Związek pomiędzy korzystaniem z SIZ a ogólną wydajnością biznesową ROE ma silne znaczenie statystyczne. Wykorzystanie SIZ osiągnęło wydajność biznesową na poziomie 2-10%. Przedsiębiorstwa, które korzystają tylko z podstawowego systemu informatycznego ERP osiągają wyniki biznesowe poniżej przeciętnej, najczęściej z ujemnym lub bardzo niskim ROE (do maksimum 2%).

**Słowa kluczowe:** zarządzanie wydajnością, wydajność firmy, system informacyjny, Słowacja

**管理信息支持戰略業務績效管理在斯洛伐克的工業企業**

**摘要：**在業務績效和戰略績效考核體系領域，已經實現了許多研究，確定了影響公司業績的主要因素。現代經濟中的商業環境世界已經大大改變了追求業務的方式，並且在很大程度上取決於生成和利用新知識，信息系統，創新和管理技術以及創造更高業務績效的工具的表現。從管理和測量績效問題的幾項研究中可以看出，績效受到很多因素的影響。這些因素對於提高業務績效很重要。本文的目的是分析可能對性能產生影響的所選管理方法和工具。我們實證科學研究的結果為斯洛伐克工業企業的整體績效提供了有趣而有價值的發現。使用管理信息系統與整體業務績效之間的關係ROE具有統計顯著性。使用MIS實現了ROE的業務表現在2-10%之間。僅使用基本ERP信息系統的企業的平均業務績效最低，ROE最高為負或極低，最高為2%。

**關鍵詞：**績效管理，業務績效，信息系統，斯洛伐克