

DASHBOARDS - EFFECTIVE INSTRUMENT OF DECISION IN SYNERGY WITH SOFTWARE SUPPORT

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Abstract: Controlling is a part of the management information and economic business systems and its use to improve the performance in the companies. This idea is a very important part of the strategy of the European Union in area development of information technologies and economic growth. The main goal of this contribution is to point out software support in praxis and the significance of dashboards for decision process in the companies, to analyse barriers and benefits of controlling implementation in Slovak companies. Experimental research was orientated on the base analyses of software products offering in Slovakia and view of dashboards of software systems -- JMP, SAS, EIS Dominant, ONIX, EPICOR I SCALA, SAP. Questionary research was realized in selected fifty companies in Slovakia in the area of engineering, mining, and building. The main results of analyses confirm the big barrier of implementation of controlling because it requires a change in the company's management system, a change in the organizational structure of the company, the creation of a controller's position and Slovak companies do not want to make changes. The total summary of analysing confirms real state that the companies have a problem to implementation of controlling but in the future is important to fill the main goal of European Union strategy in the area using information technologies for all processes in the companies and adapting to the digital economy. The primary part of controlling is dashboards that often provide views of key performance indicators in the companies and create a base for competitiveness.

Key words: controlling, dashboards, efficiency, managerial software, profit.

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Introduction

Significant advances in modern information technology are forcing companies to use Internet platforms for a successful business. The strategy of the European Union in area development of information technologies and economic growth is orientated to the digital economy and shared economy. The period of the COVID 19 pandemic is precisely the period when companies must use the principles of a shared economy and supported instrument in the form of an Internet platform. Improving business success means improving business processes and using

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process-oriented support tools to achieve key factors such as efficiency, the economy of resources and productivity. The main goal of this contribution is to point out the software support in praxis and the significance of dashboards for decision process in the companies, to analyse barriers and benefits of controlling implementation in Slovak companies. The essence of controlling approach is to achieve economic transparency in business and implementation of managerial control in all organizations, in public organizations, in multinational companies, in family firms, in the non-business sector (Deschams, 2019; Pagliarussi and Leme, 2020; Segeder et.al. 2019). It means transparency in business activities, business processes, non-business activities, planning, price calculating, budgeting, process decisions, orders, performance, care of customers, products, relationships with supplier and other (Kristani et.al. 2019; Kassay, 2002; Šatanová and Potkány, 2004, Stouthuysen et.al.2019). According to the European Commission, 60% of enterprises use shared economy by internet platform and 45% of customers used shared internet platform for buying services and products (Miharajdo, LWW et.al.2019).of controlling approach is to achieve economic transparency in business and implementation of managerial control in all organizations, in public organizations, in multinational companies, in family firms, in non-business sector (Deschams, 2019, Pagliarussi, Leme, 2020, Segeder et.al. 2019). It means transparency in business activities, business processes, non-business activities, planning, price calculating, budgeting, process decisions, orders, performance, care of customers, products, relationships with supplier and other (Kristani et.al. 2019, Kassay, 2002; Šatanová and Potkány, 2004, Stouthuysen et.al.2019). According European Commision 60% enterprises use shared economy by internet platform and 45% customers used shared internet platform for buying services and products (Miharajdo, LWW et.al.2019).

Literature review

Managerial control is a point to the base of the digital economy. Using management information systems and internet platforms is information support in a share economy (Dynnyk et.al., 2020). Very important part of information support is created by reports, that they are named dashboards (Figure 1 and Figure 2).

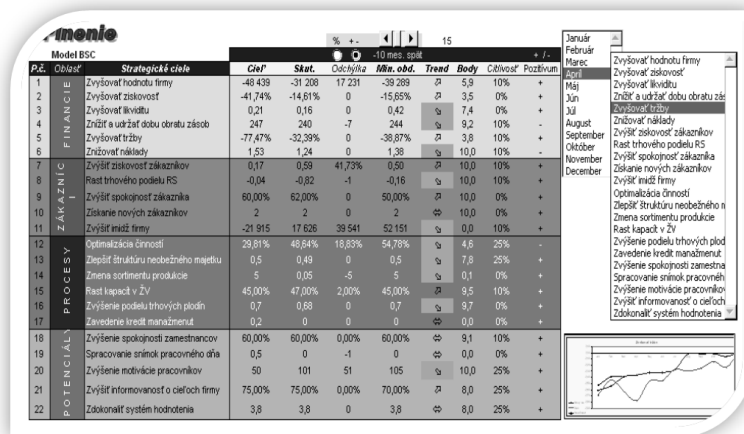


Figure 1: BSC perspectives as controlling report

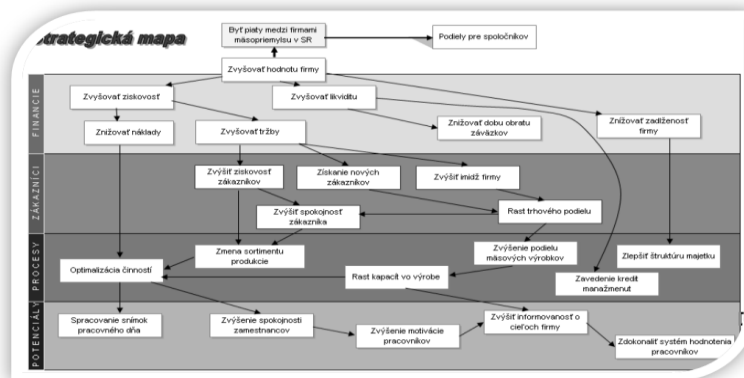


Figure 2: BSC dashboards strategic map of processes

Dashboards stand for a new instrument for performance management in the business sector. The development of sophisticated software products is often related to high uncertainty of the effect and a very big level of risk. Risks mean for security management of information systems very important data (Mayer et.al.2019). On the other hand, it is important to prepare, plan financial resources for information technologies and then to evaluate the use of information technology and information system in the companies (Borisová et.al.2019). It is important tasks are a proper assessment of the future financial value of the effect of using management information systems. A right method of calculating the value of the intellectual property (for information technologies and management information systems) is a crucial topic for decision in the companies (Cenková,

2017; Kossecki et al., 2017; Perháč et al., 2017). The design of a dashboard is more loosely defined. Dashboards are usually a series of graphics, charts, gauges and other visual indicators that can be monitored and interpreted. Quality factors based on management information system platforms are a very important indicator for the performance of the companies (Belas et al., 2019; Harlie et al., 2019). Digital dashboards projects involve business units and the information technology department (Nesterák and Bobáková, 2003) and they are used for management support in the financial area - to prepare a financial statement, to evaluate financial performance (Olah et al., 2019), in environmental area for simulation of waste, emissions, contract management for environment (Setamanit, 2019), in social, personal area -- corporate social responsibility (Tokarčíková, 2016), in the area of outsourcing, (Čerģić et al., 2019; Esslin et al., 2020). Dashboards are an output of controlling in a company. Benefits of using digital dashboards include a visual presentation of performance measures, ability to identify and correct negative trends, measure efficiencies and inefficiencies, ability to generate detailed reports showing new trends (Hitka and Potkány, 2005; Rajnoha et al., 2016). Furthermore, they provide an ability to make more informed decisions based on collected business intelligence, align strategies and organizational goals, saves time compared to running multiple reports, gain total visibility of all systems instantly and quick identification of data outliers and correlations.

Controlling is a very important part of the management information system and instrument for efficiency and competitiveness. Controlling was characterized in Refäuter (2004) as a specific form of work with information, and its role is not to direct real business processes, but the entire enterprise through information about real business processes. Moreover, controlling is defined as management approaches that allow for the setting of realistic goals that, once approved by management, become binding targets (Figure 3).

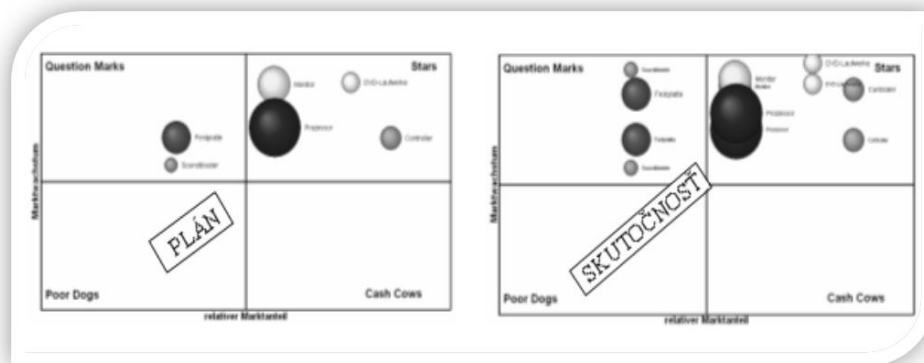


Figure 3: Planned and real goals

Controlling is defined by Petřík (2005) as a business management system based on comprehensive information and an organizational link between the planning and control process, which aims to improve business results. Petřík (2005) explains functional controlling as a business management subsystem focused on the planning and control process and on its information supports (Figure 4).

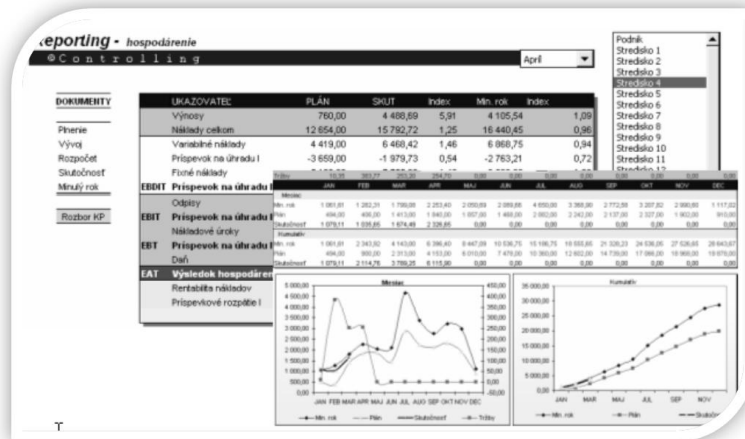


Figure 4: Reporting for control process

According to (Eschenbach, 2004), controlling is profit-oriented management and supervision. Furthermore, according to (Eschenbach, 2004) controlling is characterized as a kind of corporate governance. It is profitable management. In (Váryová and Látečková, 2011), controlling is defined as an integrative management tool that supports corporate decision-making and management. According to (Foltínová and Kalafutová, 1998), controlling is a continuous process focused on economic control of a business through economic information. Petřík (2005) defines controlling as a management subsystem focused on the planning and control process and on its coordination and information support (presented in Figure 5).

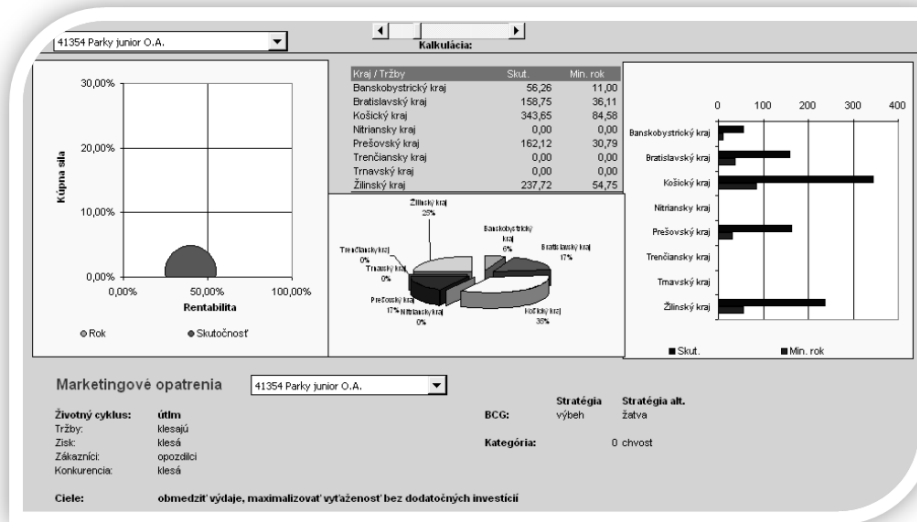


Figure 5: Reporting for control process

Methodology

In this paper, the following four-step methodological procedure was realized.

1. In the first step of the research, data collection about management information systems and their offer at the Slovak market were used. The technical parameters of MIS, price of MIS, outputs - reports of MIS for needs of companies were analyzed. Then, the advantages and disadvantages of MIS that we described in the analysis were evaluated.
2. The following software JMP SAS software, EIS Dominant, SAP, EPICORE, ONIX was used and the reports of MIS as a sample for the management of the companies were prepared.
3. In the third step of the research, barriers of implementation of controlling in selected fifty companies in Slovakia in the area of engineering, mining, and building were analyzed. This was done by the questionnaire research.
4. In the four-step of the research, benefits of implementation of controlling in selected fifty companies in Slovakia in the area of engineering, mining, and building were analyzed. This was again done by the questionnaire research.

Results and Discussion

All businesses are looking for optimal solutions for implementing controlling in the management information systems in companies. The large companies are interested in to ensure that their processes and practices are sustainable because this can enhance their image and maximize their profit (Tokarčíková et al., 2016). For the

implementation of controlling, the use of Microsoft Office, MS Access, MS Excel, and a specialized controlling system (CIS), presents the minimum financial demands. Currently, there are several companies offering controlling information systems like SAP, CUNT-KUD, EPICOR iSCALA, EVIS/400, GIST Controlling, ONIX, EIS Dominant, MRP, CROS (Čuchranová, 2001). The programming languages are a very important instrument for the creation of correct controlling software and controlling applications (Steingartner et al., 2017). Using management information systems, information technologies and platforms is the base of a portfolio of products of the digital and sharing economy. Every technological change brings with it a certain negative impact. It is therefore important to respond proactively to the growth of the sharing economy and to create the necessary systemic measures to support the positive and reduce the possible negative impacts for companies.

SOLUTION OF THE FIRST STEP OF RESEARCH:

We analyzed software support on Slovak market - technical parameters of MIS, price of MIS, outputs - reports of MIS for needs of companies. We evaluated the advantages and disadvantages of MIS.

SAP software has the largest share in the Slovak market in the provision of software products (Figure 6). The Controlling (CO) module has a significant position within the SAP system. It represents an important tool for strategic planning and management, allowing it to constantly monitor and manage costs, revenues, results, resources, deadlines, and deviations. The CO module is integrated with other system modules. The CO model allows us to perform various controlling processes:

- to plan the economic result and costs, create cost centers, create a sales plan, create orders, plan calculations, create profit center plans up to the overall plan of the organization, debit real costs and revenues;
- a possibility to analyze the causes of their occurrence, to compare the centers with each other and to monitor the internal business outcome, closing of the accounting period;
- furthermore, the state of completion and analysis of production costs, the calculation of the overheads of overheads are included.

A whole set of output reports that are the basis for analyzing and evaluating planned and actual data and helping to generate forecasts and proposals for measures for the future are included in the CO model.

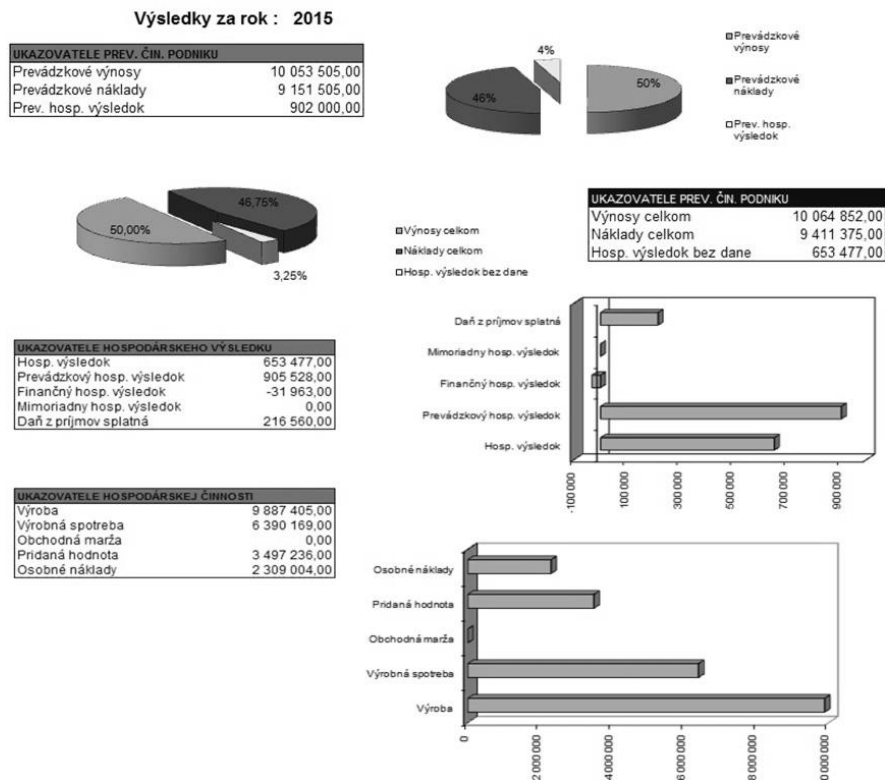


Figure 6: Results of firm for year by SAP software

CUNT-KUD

This system belongs to the Czech company, which represents the management tool for management to decide on the production and business strategy of a company. It allows reducing costs, increasing productivity and controlling the management of the centers. By introducing data into the controlling system and then comparing them with actual accounting and operational-technical evidence, deviations will be made based on which the realities of the objectives will be assessed and the direction of the development will be determined.

EPICOR iSCALA

The iSCALA Enterprise Information System is the product of an international information company, which is also represented in Slovakia and one of the most important providers of enterprise information systems (presents Figure 7).

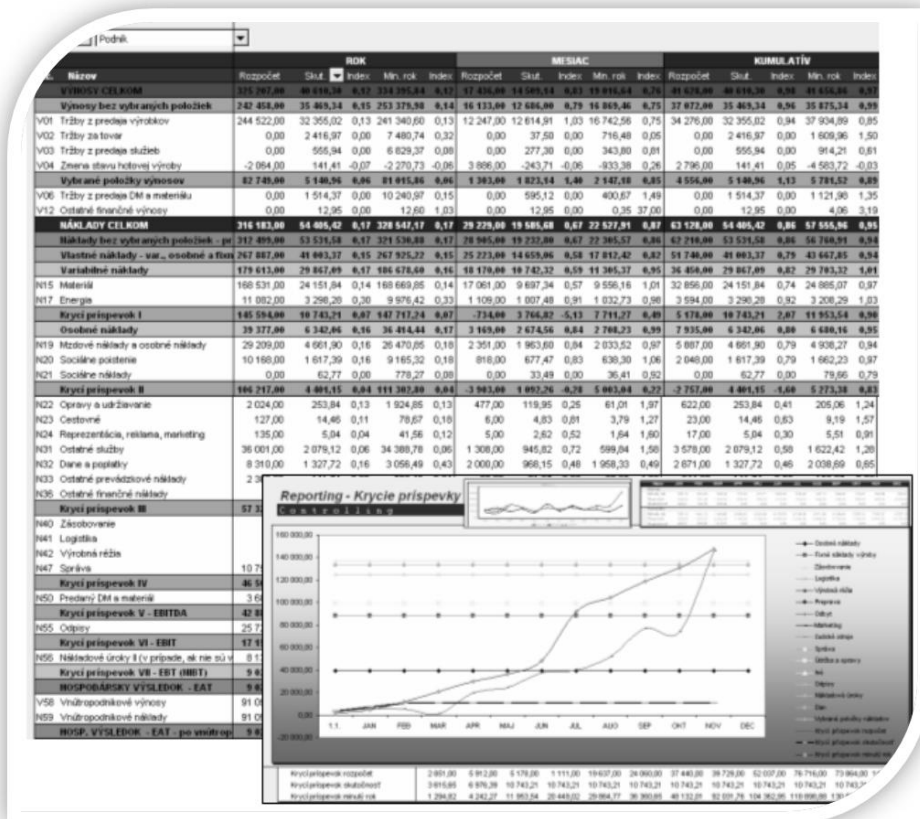


Figure 7: Results of financial indicator EPICOR iSCALA software

Controlling software support created under the Controlling module is the primary analytical and reporting tool of the iSCALA enterprise information system for organizing information sets, improving accessibility, and clarifying information. The specified parameters can be integrated into the iSCALA system or act as a standalone application. The Controlling Module is a versatile and powerful tool for accessing information and it provides several unique features: a transparent application with a graphically displayed data organization provides easy usage, organizing tree information menus in a structured tree provides users with quick and easy access to information, and it can also be used as inputs in other assemblies. In this way, the transfer of results for the further processing of the information can take place without the information leaving the security of the software. Each user has only the own data available without another user entering

them. The outputs can be created in formats: XML, Microsoft Excel, Crystal Reports graphical output, viewing table, eventual analysis and data change.

EVIS/400

EVIS/400 is a modular system in which the Controlling Module can perform all planned and actual overhead and unit costs for individual cost centers and workplaces and from them to production and commercial contracts. After every monthly ending period, when all cost information is available then calculations are made. From the accounting module and the production planning and control module, the necessary data are automatically downloaded. Calculated data can be checked during and after the computation process. This controlling module is particularly applicable to manufacturing plants

GIST controlling

Software product is operated in Slovak and Czech Republics in almost all business sectors. GIST Controlling is from the Czech company GIST it is a controlling and superstructure management system, which is composed of individual functional areas focused on a particular area. These areas include marketing and sales, profitability, purchasing, inventory, production, investment, deviation analysis, payment calendar, and reporting.

ONIX

Developed by KROS, a. s. It is enterprise software for middle sales and purchasing management. The goal of ONIX is to simplify the life of the business, to streamline and improve internal processes and save time and money. The system is designed for business and engagement companies that help not only to handle orders, invoice and inventory but also evaluate profitability in clear and comprehensible graphs. The advantage of this software is more efficient company management, clear purchasing and sales analysis, as well as a perfect overview of the contract, sophisticated warehouse management, software tailored to the needs of the professionals, and a simple and user-friendly environment. Some results of ONIX are presented in Figure 8.

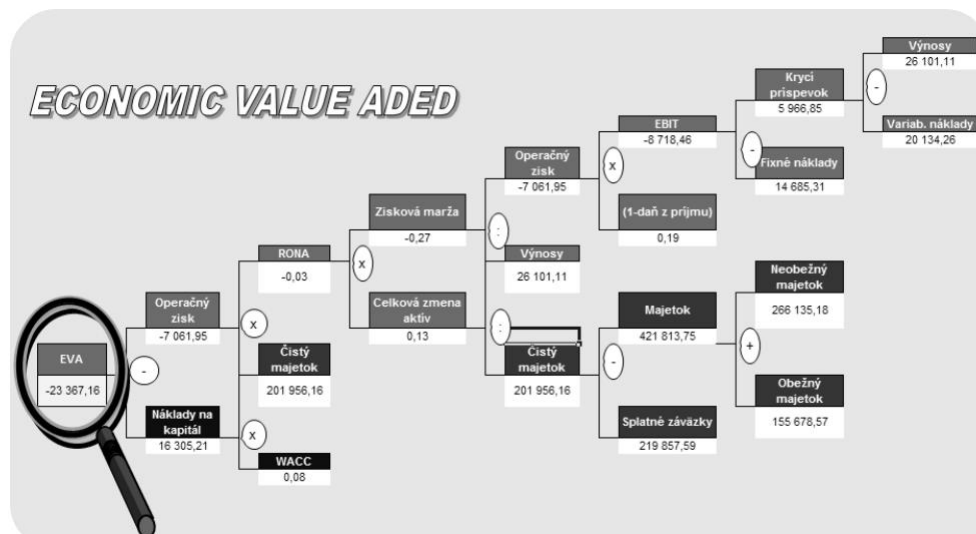


Figure 8: Economic value added by ONIX software

SOLUTION OF THE SECOND STEP OF RESEARCH:

Here, JMP SAS software, EIS Dominant, SAP, EPICORE, and ONIX were used. Then, the reports of MIS as a sample for the management of the companies were prepared.

Software support is a very effective and important instrument for processes in the company and their evaluation. Controlling is an instrument for every economic indicator and for creating a performance database (Kádárová and Durkáčová, 2012). Usage of new technologies with the support of relevant data, and increase the effectiveness of various management activities and decision-making process of managers is a base of proactive management in companies for filling new strategic aims of the digital economy (Malichová et al., 2017). In this part of the research, we would like to present a sample of financial, economic analysis, budgeting, decision tree with synergy to accounting report of management information system with controlling module - EIS DOMINANT. A very important instrument for the improvement of a managerial decision in the companies is presented here. Controlling is a management tool that can efficiently keep businesses and avoid existing problems that are often a matter of "survival" for businesses (Refäuter, 1990). Controlling emphasizes to business managers on how to achieve more effective management and business goals. Controlling expresses the complex function of economic management in enterprises (Baran, 2008) and we can understand all the activities related to the entrepreneurial activity of the enterprise. The reason for poor implementation of controlling in enterprises is insufficiently trained controlling personnel (Foltínová and Kalafutová, 1998).

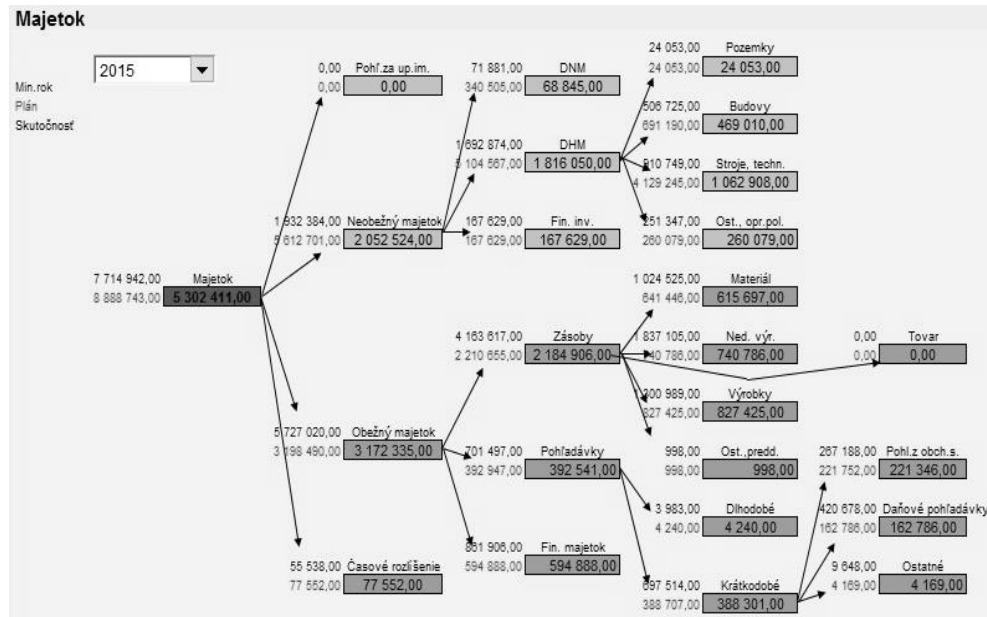


Figure 9: Report of controlling

In Figure 9, a report of assets of the firm, information of asset plan, the actual state of asset and time period was one the year 2015 were described. This report contented economic analysis of various kind of assets, budgeting for various type of asset, a form of asset - long time period, short time period, a decision tree for invest to the asset, financial page of products, payables, receivables.

SOLUTION OF THE THIRD STEP OF RESEARCH:

In the third step of the research, barriers of implementation of controlling in selected fifty companies in Slovakia in the area of engineering, mining, and building were analyzed. This was done by a questionnaire research.

The application of controlling requires a change in the company's management system, a change in the organizational structure of the company, the creation of a controller's position. With controlling implementation all barriers in Slovak companies are connected (Váryová and Látečková, 2011). The management information system and its connection to the economic and accounting system of the company, the lack of personnel competent to carry out the control function, the poor organizational structure of the company, insufficient registration system, shortcomings in the interconnection of economic analyzes, unprocessed management accounting, unfinished planning and budgeting in the enterprise, no building controlling, undefined strategic goals of the business are the reasons for

bad management system in companies. These reasons can also lead companies to bankruptcy.

We can summarize the following barriers of controlling implementation in Slovak companies according to the areas:

- Management - Problems in changing mentality and work habits with regard to increased activity and effective behavior. Leaders' orientation towards short-term goals, which is not rational in terms of strategic goals. Conflict of the process of evaluating the results, in the insufficient differentiation of factors acting on the efficiency of independent economic centers.
- Personal - Small and overloaded controlling staff, occupied by a number of tasks (three to five people). Lack of staff capable of performing the role of controller and responsible for the implementation and operation of controlling. Difficulties in selecting the staff suitable for the function of the controller. Relatively low level of training for the controlling workers. Lack of knowledge about the use of controlling tools.
- Organization structure - Problems associated with changing the organizational structure of the business. Inappropriate inclusion of the controller in the organizational structure of the enterprise and improper definition of its competencies. Management decentralization issues related to increased decision-making autonomy. Limited time to adapt verified practices and management concepts to specific business conditions.
- Evidence and analyses - Weaknesses in the detailed and systematic control of total costs, in a large enterprise are the verification of the regularity of order management in a written form very administratively demanding and difficult. Fixed and variable costs are considered to be unambiguously variable and unambiguously variable. Problems with a rigorous restructuring of the material and value planning system as well as the information system. Difficulties in the operational planning of substantive tasks in service activities. Absence of standards and indicators of the degree of wear of the production facility. Difficulties in terms of term tasks, accounting for budgeting of material and value objectives. Inappropriate way to convert inputs to outputs. An inadequate reporting system, which does not draw any specific conclusions, does not get the lead of the company.
- Information - Current state of the enterprise equipment by computer technology and lack of special programs supporting the implementation of controlling. Lack of open new networking computer network modules for business needs, while registration is often done manually.
- Finance - Lack of funding for the employment of qualified business professionals in small businesses. Lack of funds to buy the necessary computing. Few opportunities for adequate financial incentives to meet the objectives set by middle management.

SOLUTION OF THE FOUR STEP OF RESEARCH:

In the four step of the research, benefits of implementation of controlling in selected fifty companies in Slovakia in area of engineering, mining, and building were analyzed. This was done by questionnaire research.

On the other hand, also the benefits of controlling implementation in Slovak companies according to the following areas can be summarized:

- Planning, motivation - Improvement of the structure of plans, extension of plans containing external parameters, assets and liabilities, financial flows and selected indicator values. Improve the accuracy and quality of planning by identifying them by senior staff of those departments that require increased attention. Improving the effectiveness of the enterprise's management activity by deepening the knowledge of the weaknesses and strengths of the business, its bottlenecks. Increasing the motivation of executives at lower levels of management by linking tasks to the motivation system of their assessment.
- Efficiency - Improving control activity. Possibility of monitoring, measurement of indicators. Higher quality of processed analyzes.
- Strategic Goal - Greater credibility of the data. The precise formulation of tasks, business objectives. Decentralization of decision making. Improving the flow of information. Improved knowledge of middle-level managers.
- Evidence and information system - Enhancement of evidence. Extension of the recording area. Acceleration of information flow. Improving business communication across centers and between centers and economic departments.
- Budgeting - Unification of cost budget. Implementation of the calculation of contributions to be paid. Adaptation of systems for the differentiation of economic centers.

Conclusion

European Commission solves rules of the digital and sharing economy. Sharing economy can produce blackwork, tax escape and non-fair business. The use of management information systems with module controlling is a very effective and necessary instrument for decision process and innovation of digital economy approach. Experimental research was orientated on software products offering in Slovakia - JMP, SAS, EIS Dominant, ONIX, EPICOR I SCALA, SAP. Those products are the best used in the Slovak market. Questionary research in selected fifty companies in Slovakia in the area of engineering, mining, and building pointed on barriers and benefits of controlling implementation in Slovak companies. The lack of personnel competent to carry out the control function and old organization structure are the worst barriers. These reasons can also lead companies to bankruptcy. The best benefit of controlling implementation is effective planning, control, budgeting. Those benefits are an instrument for

competitiveness and to obtain a place in the industry market. Controlling report create a complex instrument for decision processes. This report contents information of assets of the firm, information of asset plan, the actual state of the asset, period, economic analysis of various indicators, budgeting for various type of asset, a form of asset - long period, short period, a decision tree for invest to an asset, financial page of products, payables, receivables. Controlling is a very effective instrument for various companies. Business processes cannot be managed without changes and improvements as new information systems, internet platforms, information technologies which can ultimately affect the price of products, demand and meet customer requirements, increased revenue from product sales, lower total costs, and profit growth. In addition to financial benefits, it is also necessary to perceive another aspect of this approach, namely to improve the information transfer system at individual management levels, to provide feedback in synergy with the customer, to eliminate ineffective activities in the chain of business processes, improve communication in the companies, educate all employees. Through controlling, key business processes can be successfully managed and enable the enterprise as a whole to build a concept of continuous improvement that is the base for the digital economy and knowledge management.

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DESKI ROZDZIELCZE - SKUTECZNY INSTRUMENT DECYZJI W SYNERGII Z WSPARCIEM OPROGRAMOWANIA

Streszczenie: Controlling jest częścią systemu informacji zarządczej i ekonomicznych systemów biznesowych oraz jego wykorzystania do poprawy wyników w przedsiębiorstwach. Idea ta jest bardzo ważną częścią strategii Unii Europejskiej w obszarze rozwoju technologii informacyjnych i wzrostu gospodarczego. Głównym celem tego artykułu jest wskazanie wsparcia oprogramowania w praktyce oraz znaczenia dashboardów w procesie decyzyjnym w firmach, analiza barier i korzyści z wdrożenia kontrolingu w słowackich spółkach. Badania eksperymentalne ukierunkowane były na analizy bazowe produktów programistycznych oferowanych na Słowacji oraz widok dashboardów systemów oprogramowania - JMP, SAS, EIS Dominant, ONIX, EPICOR I SCALA, SAP. Badania ankietowe zostały zrealizowane w wybranych pięćdziesięciu firmach na Słowacji z obszaru inżynierii, górnictwa i budownictwa. Główne wyniki analiz potwierdzają dużą barierę wdrożenia kontrolingu, ponieważ wymaga on zmiany systemu zarządzania firmą, zmiany struktury organizacyjnej firmy, utworzenia stanowiska

kontrolera, a słowackie firmy nie chcą wprowadzać zmian. Sumaryczne podsumowanie analiz potwierdza rzeczywisty stan, że firmy mają problem z wdrożeniem kontrolingu, ale w przyszłości jest ważne, aby wypełnić główny cel strategii Unii Europejskiej w obszarze wykorzystania technologii informatycznych do wszystkich procesów w firmach i dostosowania się do technologii cyfrowych. gospodarka. Podstawową częścią kontrolingu są kokpity, które często zapewniają widoki kluczowych wskaźników wydajności w firmach i tworzą podstawę konkurencyjności.

Słowa kluczowe: kontroling, dashboardy, efektywność, oprogramowanie zarządcze, zysk.

仪表盘-通过软件支持协同有效地做出决策

摘要:控制是管理信息和经济业务系统的一部分,控制用于改善公司的绩效。这个想法是欧洲联盟在信息技术领域发展和经济增长战略中非常重要的一部分。该贡献的主要目的是指出实践中的软件支持以及仪表盘对于公司决策过程的重要性,以分析斯洛伐克公司控制实施的障碍和收益。实验研究的重点是对斯洛伐克提供的软件产品进行基础分析,并查看软件系统的仪表盘-JMP, SAS, EIS Dominant, ONIX, EPICOR I SCALA和SAP。在斯洛伐克选定的五十家公司的工程,采矿和建筑领域进行了问卷调查。分析的主要结果证实了实施控制的巨大障碍,因为它需要更改公司的管理体系,更改公司的组织结构,创建控制人职位,并且斯洛伐克公司不希望进行更改。分析的总摘要证实了公司在实施控制方面存在问题的真实状态,但是将来对于使用该公司所有过程的信息技术并适应数字化来实现该地区欧盟战略的主要目标很重要。经济。控制的主要部分是仪表盘,这些仪表盘通常提供公司关键绩效指标的视图并为竞争力奠定基础。

关键词:控制,仪表盘,效率,管理软件,利润。