

WILL THE BIG DATA LEAD TO THE SAVINGS IN OVERHEAD COSTS?

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Abstract

In spite of the fact that companies are currently collecting the considerable volume of data, it is still very difficult to filter the data and use it for the purposes of financial management. It is clear that there will be an incredible increase of collected data in near future and the firms will have a competitive advantage if the data will be analysed and used actively, constantly and effectively. The production process will be rapidly changed and based on the cyber – physical systems in near future in accordance with the concept called Industry 4.0. These cyber – physical systems will allow producing the products as products of individualized mass production. It means that the products will be directly tailored on the request of the customers and will be ready on time. In order to carry out the individualized mass production, it is important to gather data and share it between machines, products, enterprise resource planning systems and other devices. The submitted paper is based on the analysis of Big Data from the view of savings in overhead costs with the main goal to characterize following possible increase of the financial performance of the company.

Key words: Big Data, changes in production system, financial accounting, management accounting, controlling

JEL Code: M11, O31, O33

Introduction

Industry 4.0 is the new phenomenon and many experts and scientists suppose it is the 4th industrial revolution. This revolution is based on the individualized mass production produced in the smart factories. These factories consist of interconnected machines that produce the production with the low share of labour work or independently on the human factor. It can bring many savings in wages, in the consumption of energies, and other operational costs. On the other hand, the companies will be forced to invest in the new technologies, machines that will be able to cooperate and share information. The production process will be much faster,

cheaper, effective, optimized in accordance with the requests of the customers. It is a big challenge for the companies, market, customers and the economy. Unfortunately, it is assumed that a lot of companies will not be able to adapt themselves to the new upcoming changes and conditions and they will go to the bankruptcy or they will be bought by their competitors because they will not be able to survive on the market.

The radical change of the production process will influence besides others the management and financial accounting very soon. The Big Data created by machines will be part of the information system and these data will be used for the processing of all accounting transactions. The new technologies allow to capture the data through special sensors, GPS or chips (e. g. RFID). It is predicted exponential growth of created data by machines in next few years. The network where the machines (smart objects) communicate and share information is called Internet of Things (IoT). As it is clear, the process of recording of the accounting transactions will be dramatically changed and mainly based on the machine processing. The corporate data will be transformed to the Big Data.

(McAfee et al., 2012) think that businesses are collecting more data than they know what to do with. To turn all this information into competitive gold, they'll need new skills and a new management style. Warren et al. (2015) and Yoon et al. (2015), suggest that the rising importance of Big Data will significantly impact accounting. This will be reflected in how data is accumulated and recorded, how management uses data to attain organizational goals, and how reporting elements are processed and assembled.

As it is clear, the importance of Big Data as a business tool is very high and companies will have to filter them effectively if they want to use the maximum of them. The authors of the submitted paper think that there is a big risk of loss of important data during their filtration in the case of the financial accounting. The company is responsible for the reported accounting information to its users. But who is responsible for collected Big Data? Is it the producer of the machine that collected and uploaded accounting information in the system or is it the owner of the machine, who bought it?

The paper tries to answer the question if the Big Data could lead to the savings in the overhead costs with focus on the administrative overheads.

1 Methodology

The submitted paper is based on the literature review and the analysis of accounting processes and collection of the Big Data in the selected companies in the automotive in the Czech

Republic that are focused on the concept Industry 4.0 and are preparing for the upcoming changes. All findings presented in the paper are the results of the unique primary research. The analysis is based on the brainstorming method with employees of the analysed companies operating in automotive industry. The next used methods were a deduction method and a comparative analysis. Due to the mentioned methods, it was possible to identify and analyse the impacts of the big data on the overhead costs as it is presented in the following text.

At first, the Big Data will be described with the focus on their functions and gaps secondly, the overhead cost will be defined. The discussion will be focused on the impact of Big Data on the overhead costs.

The amount of data has been exploding and their successful analysis is one of the main competition advantages. They are very important source of information for the production process and all business functions. Big Data can create a value if they make information transparent and usable for the purposes of the company. They are able to collect more accurate and detailed performance information and they allow to make better management decisions. It is possible to predict the future development on their basis. Due to the collected data, it is possible to prepare the product in accordance with the requests of the customers, the products could be more precisely tailored for them and consequently it can influence the financial performance of the company. (Čámská, 2014) The use of Big Data will underpin new waves of productivity growth and consumer surplus. (Manyika et al., 2011)

(McAfee et al., 2012) report that the volume of the Big Data is doubling every 40 months. It gives companies the opportunity to work with many petabytes of data. The second important function of the Big Data is their velocity. Real time information is very important for the company's purposes. That is why the velocity of the Big Data is more important than their volume. The third feature is variety. It means that the Big Data are obtained from the different sources such as GPS, sensors, chips, cell phones etc. It influences the ways of processing that information.

(Zhang et al., 2015) added the fourth feature – veracity. Every data and information are relevant only if they are true, correct and consistent. If the Big Data is incorrect the results of the analysis will not reflect the correct situation in the company, market etc. It is a big challenge for the continuous auditing to check the data sources and their consistency. Those four features characterized the principle of the Big Data.

The main aim of the financial accounting is to inform its users (internal and external) about the assets, liabilities, equity, expenses, revenues, profit/loss, incomes and expenditures

of the accounting entity. Mentioned information is reported in the financial statements in accordance with International Financial Reporting Standards (IFRS), US GAAP or other national legislation of the relevant country. The financial accounting is one of the areas that has been influenced by the Big Data. The Big Data's sources are internal and external. The internal source of Big Data represents the number of the internal transactions that are recorded automatically by the machines. External sources of Big Data are data obtained from other entities. Due to the technical development and research, a lot of new methods of capturing and recording of accounting transactions will be soon available. All those devices will be able to share information with Enterprise Resource Planning Systems (ERP) and transform the data into the information.

The Big Data will be transferred to the management accounting and used for the allocation of overhead costs. This situation will lead to the considerable increase of data ready to be analysed from the view of savings in production and overhead costs.

Although changes in accounting practices and standards in response to Big Data have yet to happen, Big Data has the potential to cause a paradigm shift allowing economic activities to be traced and measured earlier and deeper. (Vasarhelyi et al., 2015) Big Data consists of datasets so voluminous and that is why they can not be effectively analysed by traditional accounting software products. Unfortunately, the Big Data consists 10 % of structured data and 90 % of unstructured data such as phone calls, e-mails, website traffic etc. and the company will have to analyse and effectively filter them if it can use the Big Data maximally. (Syed et al., 2013)

Overhead costs are defined as expenditures which are not able to trace to or identified with the outputs produced or provided by the company such as products or services. They do not generate profit directly. On the other hand, they provide the support for activities providing the profit of the company. It is possible to describe them as important cost element along with direct materials, direct wages and other direct costs. (Fibírová, 2015) The overhead costs are divided into two main parts: manufacturing overhead costs and administrative overhead cost. Due to the scope of the submitted paper, the next text will deal with the administrative overhead costs connected with the management accounting, controlling and financial accounting.

2 Results

The problems connected with the influence of Big Data on the total amount of overhead costs were discussed during brainstorming. Consequently, the authors used the deduction method and the comparative analysis to identify the impact of big data on the overhead cost. The results are presented in the Tab. 1.

Tab. 1: Impact of Big Data on the overhead costs

Impact of Big Data on the overhead costs	Positive	Neutral	Negative
The need to filter data from Big Data			X
Radical decrease amount of employees specialized on controlling, financial and management accounting	X		
Online monitoring of the financial performance of the company	X		
Termination of paper accounting documents	X		
Reporting period could be shorter than 1 year		X	
Absolute computerization of the financial and management accounting	X		
Risk of incorrectly configured IT systems			X
Misuse of the data by external entities or unauthorized personnel			X
Interconnection between products, machines, IT systems	X		
Online communication with auditors	X		
Enormous increase of data mining			X

Source: own elaboration

We found that the need to filter data and relevant information from Big Data will negatively influence the total amount of overhead costs because due to the structure of Big Data the company will have to invest in new technologies and machines that are able to recognize relevant data from irrelevant. The system will have to be very sensitive because there could be the risk of lost important data during the filtration process. The company will face the risks connected with the incorrectly configured IT systems or misuse of unauthorized personnel or other external entities and will have to spend overhead costs on its control and protection. It is clear the Big Data will be very important for the company and that is why the company will have to increase the data mining due need to own the relevant and important data and information.

On the other hand, many employees who are specialised on the controlling, financial and management accounting will lose their jobs and they will be replaced by machines in near

future. The company will obtain savings in overhead cost. The specialist will only control if the process of controlling, financial and management accounting are set correctly. All documents will be available only in the electronic form due to the total computerization of the accounting (management, financial). The total computerization will allow online processing of the audit without the personal participation of the auditor in the company. (Griffin et al., 2015), (Alles, 2015). The products will be interconnected with the machines, production line, material, work in progress, semi-finished products, IT systems and other parts of the company. The share of human work on the production process will be minimized. This situation will positively influence the efficiency, quality, and speed of the production process and save the overhead costs from the view of wages of service personnel. (Pavelka et al., 2014)

We suppose that the reporting period in financial accounting will be shortened from 1 year period to the monthly or quarterly period. It will be the same situation as it is in the case of the consumption tax and Value Added Tax. The impact of Big Data on the overhead costs will be neutral because all information will be in the electronic form available 24 hours per day during the whole year.

Conclusion

The analysis and usage of the Big Data are very important for the company if the company would like to stay competitive in the market. This process brings many investment expenditures that are connected with the purchase of special machines, software products, staff training, improvement, changes of production processes in the company and establishment of sophisticated business co-operations with its suppliers and customers. We can say that these investments and operational expenses will negatively influence the manufacturing and administrative overhead costs and consequently the cash flow and profit of the company. On the other hand, we can see the savings mainly in administrative overhead costs such as wages of financial accounting staff, controlling staff, management accounting staff. The company will need only high skilled experts controlling all the preset processes. The most actions will be realized by machines with the low share of human work. The analytic process will be faster, cheaper and more effective if the company is able to ensure the right information system tailored to the requests and needs of the company.

The mentioned savings in administrative overhead costs will positively influence the profit of the company, its financial performance and increase its competitiveness in the

market in case that the analysis and use of Big Data will bring more benefits than overhead costs to the company.

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