APPLICATION OF THE BUSINESS INTELLIGENCE AND THE INTERNET IN FINANCE

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Abstract:
This paper looks at business intelligence and use of the Internet as an important factor in modern business. The architecture used is the sum of integrated tools, applications, and databases. This way of integrating business data ensures efficient organization, easy access to business data, reliable analysis and mutual sharing the same information. These are all the many reasons that influence the adoption of better, faster and more relevant decisions, thereby improving overall business efficiency. For this purpose, in the world to use neural networks for tracking financial data used as input to financial ratios. This process is carried out rationalizing the total financial coefficients by their number is reduced by 3-4 times. [5]

Key words:
business intelligence, internet, data mining, neural networks, logarithmic regression.

INTRODUCTION

Since the use of business intelligence showed significant and useful in practice and contributed to developing the cooperation of modern information technology and finance, our economic practice needs to undertake significant activity to introduce them. The use of business intelligence by the use of the Internet has enabled companies, in addition to creating and managing the business, to make it transparent to all stakeholders via the internet. Publicity display, on one hand provides efficient operations with the clients, but on the other hand may lead to unauthorized use, or in some cases, even the misuse of data. The most serious problems of abuse exist in financial institutions, and in other activities of unfair competition and alike. Information warfare on the other hand is regarded as knowingly spreading accurate or inaccurate information about a competitor or organisation, or preventing a competitor or organisation in spreading its information. The information itself is not important in this field, but what is more important is how the information is presented, where it is presented and who is presenting it. Before the Internet, it was easy to detect moves from competitors or organisations, and it was easy to trace the information back to the source.[8]

When we analyze the usefulness of business intelligence and business over the Internet for good business optimization we must ensure consistency of informa-tion structure on the basis of quality data, then create a platform for decision-making so the decision maker can make use of analytical data at the right time. The basis for the reliable operation of the harmonious relationship of information flow, information system and the business sector. [5]

THE APPLICATION OF NEURAL NETWORKS IN THE FRAMEWORK OF BUSINESS INTELLIGENCE

It is evident that there are certain advantages of modern technologies for more efficient and effective management of business systems. The achieved level of economic development of the economy is not high and it would certainly be good to use foreign experiences that have already shown good results in this field [5]. Developed economic countries, starting in the eighties of the last century, and especially during the nineties, have significantly improved the financial analysis of the application of neural networks suppressing classical (traditional) statistical methods. In the course of these changes in practice there was a need for separation of analytical methods in successful and unsuccessful companies. The analysis showed that the same economic indicator does not make a credible assessment of the economic situation or enterprises of different types of business success. Because these issues were observed separately, the results of the economic analysis classified the company as successful and unsuccessful. We know that

the indicators on the daily operations of neural networks are reliable, so that its application can contribute to the control of production of goods and services, which is an essential prerequisite for increasing the competitiveness of the economy and finance.

The application of neural networks in the framework of business intelligence, thus, gained a lot of confidence and has found wide application in the fields of economy, econometrics, finance and accounting. [1] The main problem at the beginning was how the application of business intelligence would recognize and understand the true meaning of financial data and stochastic relationships and create financial ratios (financial ratios) based on the different types of accounting entries and financial models of successful and unsuccessful companies. That was the main reason why the parallel comparison was made of the results of financial ratios to fit both the old traditional and new (neural networks). Considering that a large part of our economy is below the average business results in comparison with the world, we may need to apply logic and analytical tools that have been subject to detailed analysis of the world started more than twenty years.

The economic situation of economic performance of enterprises can be viewed through economic ratios, which are normally used as predictive variables. Each of economic ratio indicates the various financial aspects of the company that is viewed. [3] There are companies that are successful, less successful and struggling to survive, and those that have failed. Until the appearance of neural networks, different statistical methods have been used for predicting and providing answers to the simple questions: Will the company achieve good results ? With the introduction of neural networks, stochastic algorithmic support was implemented. A large number of scientists developed a number of analytical tools starting from Z-scores to discriminant analysis (DA), and the observation of various financial ratios or ratios.

It was noted that the logistic regression analysis based on a cumulative probability function, which does not require normal distribution or equal covariance, and can generally be solved using similar methods schedule. The first analysis showed very promising results,leading to a broad application of business intelligence in various risk assessment methods. Since a a significant breakthrough in development of the capital market has not yet happened in our environment, the study and application of these models has remained on a theoretical level. What is much more realistic and necessery in our economic practice is to use of business intelligence to estimate business performance of enterprises operating at a loss. This is our reality.

To be able to apply the techniques of business intelligence in the first place, it would be mandatory to make a classification of successful and unsuccessful companies. The classification could be done by observing the business results, for example in the last five years. This is a period long enough for one production cycle by which we can determine the reality of results.

Introducing analytics business intelligence application model showed that, except Altman's Z" score" practical utility is at a high level. In these models, for our economy, it would be important to make a classification of two sample companies according to sectors: successful and unsuccessful. Division by failure can be done on the basis of indicators according to the legal regulations that show if these companies have the elements of bankruptcy, liquidation or receivership. The division by success is evident by the actual indicators.

The importance of the implementation of the new models would indicate a potential failure and thus enable us to undertake measures for recovery. For each a case study, we would have to introduce additional analytical elements in order to ensure the credibility of the analysis. [3] The application of neural networks reduces the number of statistical ratios, and increases the possibility of comparing the economic position of the company within the economic system.

A typical neural network is generally composed of a group of three elements: the input, hidden and output data. The input data are the financial radios (quotients) and they need to be adept to neural networks. This process usually requires a decrease in the total number of ratios which really reflect the economic situation. In this test the process of increasing the number of quotients is reduced two to three times, thus making it easier to do a better analysis. Hidden data are those that are essential for economic analysis, but can not be directly expressed through financial ratios. They are directly introduced through a neural network in the output data analytics, for example. prediction whether the loss occurs or not in the company. [2]

For neural network essential elements of the data are presented in the financial, accounting and statistical reports. Analytical study of neural networks, in our case, would have an important role in companies whose business results suggest long-term losses and could be" mature" for bankruptcy. As a basic problem in this analysis, a lac of flexible accounting data occurrs, because they are always presented according to the given regulations and carry with them an element of static. Observations of the accounting data is of mostly static character. The biggest problem with the researchers of this model was the translation of the financial ratios that had a high percentage of random statistical errors.

The choice of applying stochastic approximate algorithm always depends on at least three elements: type of industry that the company belongs to, the size and location of its operations. Financial data is still, according to the rule, because of the reliability, using the sample data from the balance sheets of operations in the period of at least five years of complete data of all transactions of the company in the capital market. Now we see a problem that can occur in our practice because we have diversified and efficient operation of capital markets. Our capital market by volume of transactions is small and with underdeveloped financial instruments for trading.

Also, the overall size of the financial assets of our individual observations of the company is small and so far almost no one is listed on one of the world's stock exchanges. Of course this should not be a problem, however, goes to the improvement of analytical instruments such as different models of business intelligence. The gradual introduction

would lead to the application of modern information technology and would directly affect the conduct of an effective, profitable business.

ECONOMIC ANALYSIS AND DATA MINING

Data from administrative, logistical and commercial enterprises and public administration are, by nature, heterogeneous. Although collected in a systematic and structured way, these data cannot be used directly in decision-making processes. We need to organize and process data using appropriate tools to transform them into information and knowledge applicable by decision makers.[4]

An example of the analysis that was conducted in the eighties in England on a sample of 46 successful and 46 unsuccessful companies in the industrial sector, has shown its full economic justification. In the first phase carried out by comparing each calculated financial ratios (indicators). Some of the indicators were not comparable, simply because failing companies did not have some degree of measurability of certain economic categories. Thus, at this stage it was observed that the comparison can be performed, Reduction of the total number of indica-

tors. The analysis was conducted based on the results 28 financial ratios.

The empirical results obtained were formed as a product of two lines of research that were created by reducing the number of observed indicators and monitoring forms of graphic curves that had to maintain the same direction, and were comparable, although there has been some reduction indicators. So get a more efficient method of observation of a small number of economic indicators, but credible, that portrayed the true state of the economic situation.

The first direction is the reduction observed 28 financial ratios, grouped by autonomous - organized folders indicators (Self - Organization Feature Maps - SOFM) to 10 financial ratios, while the other direction observing the basic components analysis (Principal Component Analysis - PAC) was the reduction of these same 28 financial indicators at the 9th In both cases, the results showed the scientific validity where the SOFM unquestionably accepted as good of valuation of financial ratios. Further analysis was performed by the the adjustments of financial ratios according to the equation where the reduced base value for the value of the standard error.

Table 1. Self-classified data and principal components analysis

Self-classified data (SOFM)	
PAT/TA PAT/CE NI/TA NI/TCE PBT/TCE RP/TA PBT/TA	Return on Equity
NI/S NP/S PBT/S CF/S	Profitability
NI/TL PBT/CL PAT/CL	Risk
NP/TA CF/TA CF/TCE	Cash flow assets
QA/TL QA/CL	Short-term liquidity
CA/CL (QA-OD)/CR	Liquidity-risk
NW/TA EQ/TA	Transfer rate of capital
CF/CL CF/TL	Cash flow Risk
WC/TCE WC/TA	Capital Employed
CL/TA	Level of debt

Principal components analysis (PCA)	
PAT/TA PAT/TCE NI/TA NI/TCE NP/TA PBT/CA CF/TA CF/TCE NI/TL	Return on Equity
NI/S NP/S PBT/S CF/S	Profitability
WC/TCE WC/TA CA/CL	Capital Employed
CF/CL CF/TL	Cash flow assets
QA/TA QA/CL	Short-term liquidity
PBT/CL PAT/CL	Risk
NW/TA EQ/TA	Transfer rate of capital
CL/TA	Level of debt
(QA-OD/CR)	Coverage of loans

CA: *Current Assets* CL: *Current Liabilities* TA: *Total Assets* QA: *Quick Assets* TCE: *Total Capital Employed*, OD: *Overdrafts*, CR: *Creditors*, NW: *Net Worth*, WC: *Working Capital*, EQ: *Equity*, CF: *Cash-flow*, PAT: *Profit After Tax*, PBT: *Profit Before Tax*, NI: *Net Profit*, RP: *Retained Profit*, S: *Sales*.

Following the analysis performed in several iterations assigned to Model 4 financial ratios (ratio), which has emerged as the most trusted economic representative economic status. [2] It includes the following categories:

1. Profit before tax to total capital employed,
2. Liquid assets to current liabilities (liabilities)
3. Working capital (assets) to total assets (assets) and
4. Shareholders' equity to total assets (assets).

The four ratios gave the most accurate results to a logarithmic regression (logistic regression - LR) and discriminant analysis (discriminant analysis - DA). Total percentage deviations due to disparate types of errors, was around 30-34%, which is within the limits of acceptability.

CLOSING THOUGHTS

The main advantage of business intelligence techniques is that they allow the data itself to adapt to the model to the specific case in practice, specifically to the theory that supports them. What is also important in the application of analytical techniques of business intelligence is to take longer time than the calculation of financial ratios. All results are obtained in the shortest period of time and have no prerequisites or restrictions that are characteristic of the model SOFM. In addition it is much safer and more reliable because it provides a completely objective comparison of actual performance of companies in relation to the sector to which it belongs. After harmonizing regulations in the recording of accounting data (application of international accounting standards), the reports generated are a solid foundation to start with applying the techniques of business intelligence.

The introduction could first be done in the financial sector of the economy, followed by the industrial and other. Existing equipment of information technology in the biggest part of the financial sector and part of the industry is satisfactory. The next step would be to use a higher level of connectivity and multi-disciplinary teams, with the aim to speed up the modernization of monitoring business performance.

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PRIMENA POSLOVNE INTELIGENCIJE I INTERNETA U FINANSIJAMA

Abstract:

U ovom radu se posmatra poslovna inteligencija i korišćenje interneta kao bitan faktor u savremenom poslovanju. Arhitektura koja se koristi predstavlja zbir integrisanih alata, aplikacija i baza podataka. Ovakav način integrisanja poslovnih podataka obezbeđuje efikasnost organizaciji, lak pristup poslovnim podacima, pouzdanu analizu i međusobno deljenje istih informacija. To su sve brojni razlozi koji utiču na donošenje kvalitetnijih, bržih i relevantnijih odluka, čime se poboljšava sveukupna poslovna efektivnost. U te svrhe, u svetu se koriste neuronske mreže za praćenje finansijskih pokazatelja koje koriste kao ulazne podatke finansijske koeficijente. U tom procesu vrši se racionalizacija ukupnog broja finansijskih koeficijenata tako što se njihov broj smanjuje za 3 – 4 puta.

Key words:
poslovna inteligencija,
internet,
data mining,
neuronske mreže,
logaritamska regresija.