



BENEFITS AND ADVANTAGES OF BUSINESS INTELLIGENCE IN CORPORATE MANAGEMENT

Peter Mesároš¹, Štefan Čarnický², Tomáš Mandičák³

^{1,3}Technical university of Košice, Faculty of Civil Engineering, Slovakia

²University of Economics in Bratislava, Slovakia

ABSTRACT

Paper solves issue of Business Intelligence in corporate management. The need to efficiently manage data and information grows as well as increasing the amount of data and information. With new technologies and tools are also increasing opportunities to efficiently manage business and corporate processes in every field. Business Intelligence (BI) is one of these tools. This paper describes BI as a tool for corporate management. The paper mapped solution that offers business intelligence. Further defined the scope of this tool. In the analytical part are handled benefits and advantages of using Business Intelligence. Similarly this part of the contribution deals with the impact of BI on the overall performance of the company.

Keywords: business intelligence, corporate management, benefits and advantages, information, data

INTRODUCTION

Nowadays every business addresses a number of business processes and operations. In view of their extent of is an absolute need to manage these processes and thus increasing the efficiency of projects and activities that the company must address. For effective management of business processes Exits multiple software solutions. Business Intelligence is increase eligibility for these.

Business Intelligence systems, which are designed to improve decision-making in enterprises, became an important part of management in recent years. BI system presents a complex task, technology and applications of information systems which strongly support analytical and planning activities of enterprises and organizations. They are built on the principle of multidimensionality by which are understood the opportunity to look at the reality from several possible perspectives. According to Gartner Group survey, BI is implemented in nearly 80% of companies in the U.S. and 50% of companies in Europe. These relatively high percentages of BI extensions are mainly based on their effects on business success and the company's performance.

The roles of Business Intelligence in Corporate Management

In an increasingly tougher competition, corporate managers and analysts have to decide under time pressure and with high responsibility. It means that these decisions must be supported by relevant and objective information available quickly, with minimal technical complexity of handling, while ensuring rapid formulation of new demands for additional information corresponding to the situation of the decision-making process.

Existing information systems for enterprise resource planning (ERP) are not capable to fulfil the requirements. Storing and manipulating data in transactional systems, especially ERP applications, is fully based on the use of relational database systems. This solution is in many ways very convenient. Data are clearly presented here, and, if properly designed, database allows quick implementation of individual transactions and to provide adequate response time to questions posed. In addition, ensure data integrity, security, data access and other necessary characteristics associated with the management on a tactical or operational level. ERP applications, however, according to [1], have some limitations in terms of analysis and planning activities of enterprises.

BI is an analytical process that is able transform isolated applications and data into a business focused knowledge and skills. To realize this process is essential to gather data from various sources (internal and public), perform the analysis, to identify their structure, calculate patterns and compile them as outputs, to allow company management to decide according to them adequately [2].

Business Intelligence is a set of processes, applications and technologies designed to effectively and efficiently support the decision processes in the company. These tools enhance analytical and planning activities of enterprises and

organizations. They are built on the principles of multidimensionality of business data. BI applications cover analytical and planning functions of most areas of business management, i.e. marketing, purchasing, sales, financial management, controlling, property, human resource management, manufacturing, IS/ICT, etc. Furthermore, using BI applications is possible in other areas, such as managing corporate performance (CPM – Corporate Performance Management), customer relationship management (CRM - Customer Relationship Management) and others [3].

BI represents a broad complex of tools and applications, which include:

- source and production systems,
- temporary data storage (DSA - Data Staging Area),
- operational data store (ODS - Operational Data Store),
- transformation tools (ETL - Extraction Transformation Loading),
- integration tools (EAI - Enterprise Application Integration),
- data warehousing (DW - Data Warehouses),
- data markets (DMA - Data Marts)
- OLAP database (OLAP - On Line Analytical Processing),
- reporting,
- management applications (EIS - Executive Information Systems)
- data mining (DM - Data Mining),
- tools to ensure data quality,
- tools for managing metadata, etc.

There are different opinions concerning the tools which are part of the BI. Together with this broad understanding of BI content there is another view that sees BI as one of tools of data warehouses or marketplace. Below, we will continue to adhere to the first broad understanding of the BI content.

BI is focused on proper use of information in management and decision making and not only on data processing and implementation of current production, trade, financial and other transactions. Optimal utilization of BI, strongly affects the performance and quality of corporate governance and its overall success and competitiveness.

BI in enterprises is closely related to other applications of IS/ICT, which draws on the input data and more recently the data are returned into other applications. The quality of BI is largely dependent on the quality of other (transaction) applications, especially on the so-call

Business Intelligence and Its Basic Application Areas

BI represents the entire information system and applications that have very strong relations to other applications, projects and databases, such as ERP (Enterprise Resource Planning), CRM (Customer Relationship Management), SCM (Supply Chain Management), PRM (Partner Relationship Management), e-Business, specialized systems to support financial and other departments. These systems compared with BI applications are not designed for analytical tasks. Of all these systems is the architecture that supports storage and modification of data in real time.

BI is closely related to these other applications of IS / ICT, which draws on the input data and recent data and other applications, often in return. It follows that BI does not project or operationally isolated unit, but on the contrary, the solution must be permanently in accordance with state and development of other applications in the information system. In addition, this means that the quality of BI solutions is closely dependent on the quality of other transactional applications, especially the quality of source data, respectively, databases.

The BI application is the application software meeting the characteristics of BI and related equipment technology infrastructure (technical equipment, operating systems, database systems, and facilities management applications), data base and documentation. BI technology can be used in virtually all fields of human activity where it is necessary to monitor and analytically evaluate the values of certain parameters. At present, therefore, there is also a wide range of applications or BI solutions specialist for an area that their functionality in many cases overlaps.

The company or organization covers BI application analysis and planning functions in almost all areas of corporate governance, i.e. financial management, marketing, purchasing, sales, controlling, property, human resource management, manufacturing, IS / ICT, Corporate Performance Management, Customer Intelligence, Web Analytics and so on [1]. This includes the following:

- **Finance** - Finance is one of the most common application areas of BI in enterprises and organizations in the area of financial management. BI in this area allow for control of financial management company [4]. Data from completed financial and accounting operations are stored in the data warehouse. Based on these data BI applications offer the possibility to obtain the values of indicators of financial performance for the entire organization, for individual plants, cost centres, projects, product groups and like. The result of the working panels or outputs, which allow for the financial management indicators deviate from the planned values, immediately find a place where there is a problem and take appropriate corrective action.

Implementation of BI applications in the field of financial management usually entails (in view of the obligation to assign the costs of cost centres, projects, etc.). Introduction of high financial transparency, particularly in the area of cost management, is very important. BI systems are used in financial corporate management in the following areas:

- financial planning and forecasting,
 - analysis of costs and profitability,
 - financial reporting and consolidation,
 - risk Management,
 - financial Optimization,
- **Human Resources** - This area is mainly in large enterprises supported by the specialized application of BI. These applications allow you to effectively create apply and monitor the organization's strategy in this area and in particular it decomposes to the level of specific organizational units or employees. Very often, this area is also associated with the type of applications of CPM (Corporate Performance Management). BI in support of human resources used in the following areas:
 - selection and motivation of staff,
 - analysis of working forces,
 - cost of labor,
 - **Management of relationship with suppliers** - BI allowed by the use of the information stored in the transactional enterprise system and the data sources provided by different suppliers (price lists, plans, vacancies, etc.) [5]. Effectively support all activities associated with managing relationships with suppliers. The precondition for effective BI using of BI applications is to create data warehouse components to purchase products and services from individual suppliers. Key issues in this area are the quality and standardization data provided by suppliers (comparison of conditions of purchase and delivery, discounts, allowances, freight, etc.). In order to use BI applications to reduce overall costs and improve purchasing efficiency and control over the entire process of purchasing the company. BI can be used in the following areas:
 - buying out a strategy,
 - evaluation and selection of suppliers,
 - purchase analysis,
 - **Marketing** - The aim of BI applications in marketing is primarily to assist in analyzing and planning marketing campaigns and for the analytical evaluation of their implementation. In recent times the area of marketing supported applications like CI (Customer Intelligence). Nevertheless, we can still meet with applications of BI intended only to support the marketing business. Possibilities of using BI applications to support marketing are in the following areas:
 - portfolio Analysis products and services,
 - customer segmentation and classification,
 - **Production** - A very important application area of application of BI is the production area in conjunction with quality control in manufacturing processes. Comprehensive overview of the history and current status of production including the structure of production facilities and associated quality control is now an essential part of effective management of the production process. To support the management of production BI applications are used in the following areas:
 - planning and monitoring of key indicators,
 - **Logistics** - Information about the handling of individual consignments is stored in a data warehouse. Based on this information may be officers, but also specific employees to monitor the effectiveness of the whole process of delivery of goods to customers, as well as the effectiveness of the various parts of the process. At present, the development of information and communication technologies spread throughout the delivery process records. BI is available so much more information than in the past, and therefore the range of their possible use is very large.
 - effectiveness analysis of carriers,
 - on the analysis of costs,
 - capacity Planning,
 - time delivery analysis,
 - analysis of the causes of problems and complaints.

The process of implementation and use of BI in enterprises is quite challenging and complex. It affects a number of problems and obstacles that hinder businesses to achieve the intended benefits.

To ensure the desired benefits is therefore necessary for enterprises to identify these BI success factors and parameters that are relevant for these enterprises. It is important also these BI success factors monitor during the phase of implementation and use. The BI success factors take into account the state of governance and levels of BI strategy and have the potential to achieve the desired result or expected benefits. Identification, ongoing monitoring and targeted management of key success factors in the process of BI implementation and use of BI are becoming essential assumption of the overall success of BI and achieving the desired benefits.

Successful use of BI allows getting multiple benefits. According to Gartner Group survey which has been conducted several years ago BI systems have been implemented in almost 80% corporations in the U.S. and in about 50% of companies in Europe. This relatively high percentage of extending BI is primarily due to the benefits or effects for the success and performance of business enterprises. We will try in this section to point out some of these benefits, whether quantitative or qualitative, which are not so obvious at first glance.

Implementation and use of BI solutions brings to the firm a number of benefits – there are positive economic and non-economic benefits or effects that businesses should gain if they successfully manage the BI implementation of solutions. Some benefits are quantitatively and objectively measurable, but many are qualitative and cannot be expressed by exact numbers.

Numerous authors have examined the benefits associated with the use of BI [6]. Results of a survey in 510 corporations, which aimed to determine the benefits of BI. Survey respondents identified the following benefits as the most important benefits of BI:

- time savings (61%),
- a single version of the truth (59%),
- improved strategies and plans (57%),
- improved tactical decisions (56%),
- streamlined processes (55%),
- cost savings (37%).
-

Another author who devoted himself to investigate the benefits of BI is O. Thompson (2004). The survey results led him to outline the following major benefits of BI:

- faster, more accurate reporting (81%),
- improved decision-making (78%),
- improved customer service (56%),
- increased revenue (49%).
-

C. Howson [7] considers the increase of overall corporate performance as the most significant effect resulting from the use of BI. The extent, to which BI contributes to enhance the performance of the organization, would be, according her opinion, a priority measure of the success of these solutions in practice. This argument relies on the results of research conducted in 2006 on a sample of 513 companies. Based on the responses of participating respondents, she could graphically illustrate the extent, to which BI was affecting the performance of surveyed companies. Figure 1 on the y-axis shows the number of respondents expressed in %, x-axis degree of influence to change the BI performance as perceived by addressed participants. In addition to increasing business performance author presents other major benefits that emerged from the survey. Specifically, it is relating to the following benefits associated with application of BI (Figure 2).

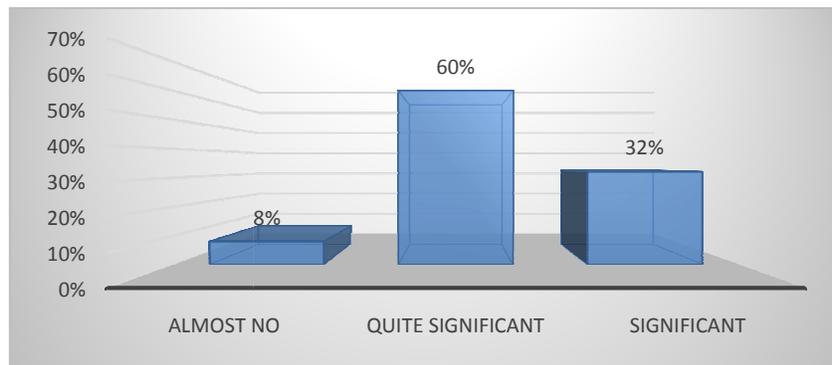


Fig. 1 Impact of BI to change the overall performance of the organization (after Howson [7])

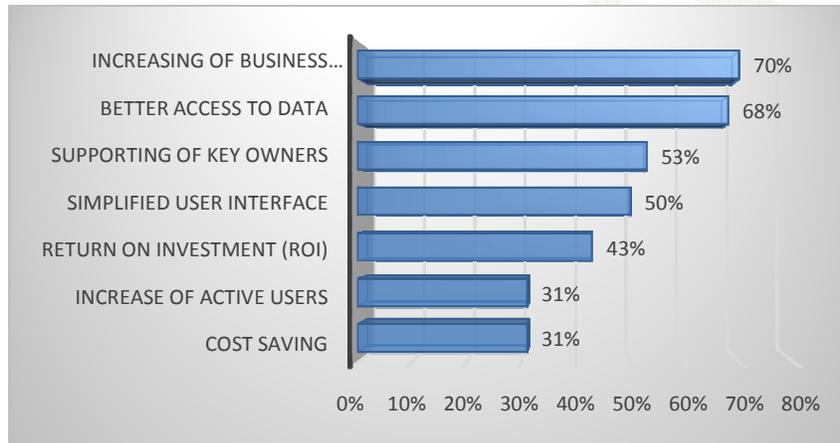


Fig. 2 The benefits associated with application of BI (after Howson [5])

Other authors [8] perceive the ability of BI systems as their most significant effect for the company to be able in the case of need to provide accurate information rapidly, including looking at the overall performance of the company and its individual components in real time. Such information is, according to them the need for all kinds of decisions for strategic planning and even the survival of the company.

BI provides users a number of benefits and improves internal processes. According to P. Jiruše [9] clients most often cited the following benefits:

- providing timely, transparent and comprehensive information in the user-friendly format,
- increasing the availability of information aimed at facilitating decision-making at all levels,
- automation of warning process and alerting the resulting anomalies including the possibility of immediate in-depth analysis,
- ease of customization of reports and tools for the specific user,
- reducing the amount of manual labor in the preparation of reports, thus getting more time on the actual analytical work,
- minimizing IT staff involvement in the process of creating, editing and publishing reports,
- shortening the process of creating reports and reports from a number of weeks or months to days or weeks,
- replacement of Microsoft Excel, if it is not sufficient.

J. Lachlan [10] identified on the basis of research following major benefits associated with the use of BI:

- providing in-depth, respectively close-up view of the data,
- improving access to data enabling better and faster decisions based on facts,
- improving responsiveness and reducing risk,
- linking achievements and set goals,
- facilitating the measurement and monitoring of the development of key indicators,
- a better understanding of customer behavior,
- reduction of costs,
- streamlining operations,
- streamlining the supply chain,

- increasing data protection,
- the possibility of predicting future results.

There are plenty of studies that describe the benefits of BI. Important factors for the overall success of the implementation of BI are the expectations of participants. Every BI implementation also brings expectations. Therefore, it is important to know the benefits that businesses expect after implementation. M. Hannula and V. Pirtimäki [11] conducted a survey of the expected benefits of the 50 largest Finnish companies, which introduced a BI system. The results of this survey are in Figure 3.

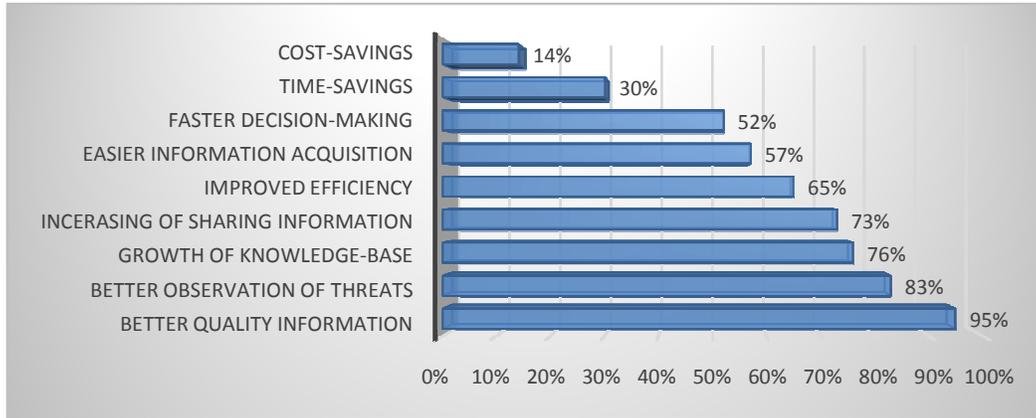


Fig. 3 Benefits expected from BI activities (after Hannula, Pirtimäki [11])

CONCLUSION

Current need to effectively manage business processes, data and information is indisputable. BI is one of the most frequently used tools for this activity. BI can be used for these purposes in almost all areas of business. In each sector has its justification to use it. In studies, the results of which are presented in this article can say the following.

Among the most anticipated benefits, it can includes better quality information, better observation of treats and opportunities, growth of knowledge-base, increasing sharing of information and improved efficiency. Cost saving is the less anticipated advantage, although it plays an essential role from business perspective.

This is the overview of benefits of BI based on the experiences and research of other authors, it is clear that the benefits of BI are indeed very important and with the ability to quickly, accurately and with minimal cost to process information BI systems enable businesses to improve their efficiency and competitiveness. Implementation of BI in enterprises (all departments and treating all data) then produces the maximum effect.

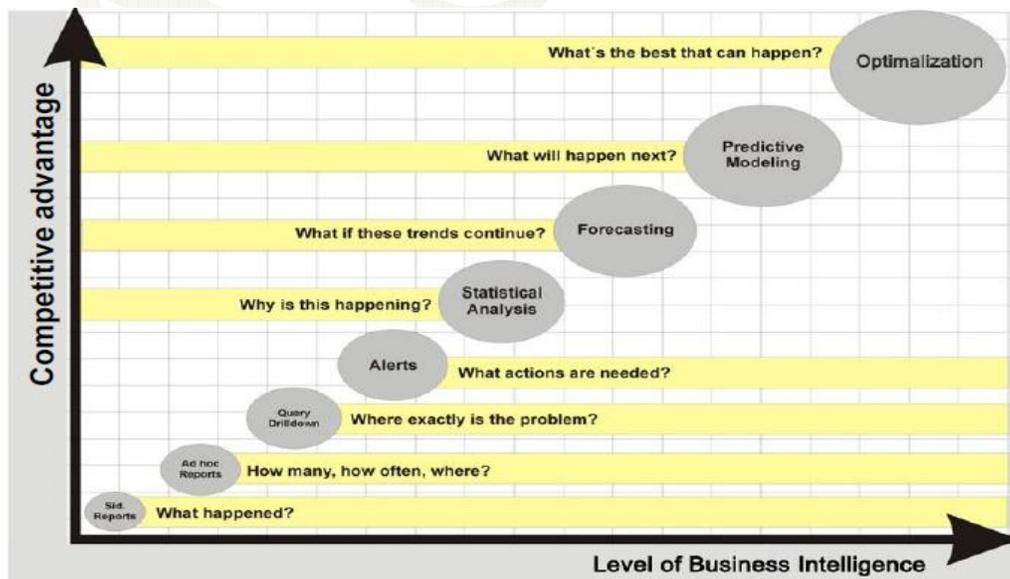


Fig. 4 Levels of Business Intelligence (after Sahoo [12])

BI benefits largely depend on the level achieved using BI in enterprises. Fig. 4 shows the relationship between different levels of BI and the size of the competitive advantages that correspond to these levels of BI. The higher level of use of BI businesses reach, the higher will be their competitive advantage. In parallel to achieve higher competitive advantage it will be able to obtain higher economic and non-economic benefits. Achieving higher levels of use of BI will allow enterprises significantly improve their efficiency and ultimately their competitiveness.

ACKNOWLEDGEMENT

The paper presents partial results of the research project VEGA No. 1/0562/14 „The impact of Business Intelligence tools on corporate performance“.

The article presents a partial research result of project VEGA - 1/0677/14 „Research of construction efficiency improvement through MMC technologies“.

The paper presents the results of the project “Identification of key competencies of university students for the needs of knowledge society development in Slovakia”, which is supported by the Ministry of Education, Science, Research and Sport of the Slovak Republic in supplying incentives for research and development from the state budget in accordance with Act no. 185/2009 Z. z. on incentives for research and development and on supplementing Act. 595/2003 Z. z. Income Tax, as amended, by Act no. 40/2011 Z. z.

REFERENCES

1. O. Novotný, O., J. Pour and D. Slánský (2005) *Business Intelligence. Jak využít bohatství ve vašich datech*. Praha : Grada Publishing, ISBN 80-247-1094-3
2. G. B. Davis (1997) *Blackwell Encyclopedic Dictionary of Management Information. Systems*. Oxford Blackwell Publishers Ltd. ISBN 155-7869-480
3. Czech Society for Systems Integration, [online]. 2014. Available online: www.cssi.cz
4. S. Scheps, (2008) *Business Intelligence for Dummies*. Indianapolis” Wiley Publishing. ISBN 978-0-470-12723-0.
5. E. H. Schein, (1994) *Organizational and Managerial Culture as a Facilitator or Inhibitor Organizational Learning*. MIT Sloan School of Management.
6. Š. Čarnický and P. Mesároš. (2009) *Informačné systémy podnikov*. Bratislava: Vydavateľstvo EKONÓM, 265 s. ISBN 978-80225-2676-0.
7. C. Howson, (2007) *Successful Business Intelligence: Secrets to Making BI the Killer App.*” New York: McGraw-Hill Companies. ISBN 978-0-07-149851-7.
8. E. Turban and et al. (2010) *Decision Support and Business Intelligence Systems*. New Jersey : Prentice Hall. ISBN 978-0-13-610729-3.
9. P. Jiruše (2010) Analýzy pro podporu rozhodování. *IT Systems*, vol. 11, n. 6, s. 34-35. ISSN 1212-4567.
10. J. Lachlan (2011) *Top 14 Benefits of Business Intelligence.*” [online]. 2011. Available online: <http://smartdatacollective.com/yellowfin/42423/yellowfin-top-14-benefitsbusiness-intelligence-part-one>
11. M. Hannula and V. Pirtimäki (2003) Business intelligence empirical study on the top 50 Finnish companies. *Journal of American Academy of Business*.
12. Sahoo et al. (2008) An ontology-driven semantic mash-up of gene and biological pathway information: Application to the domain of nicotine dependence. *Journal of Biomedical Informatics Special Issue: Semantic Biomedical Mashups*.