SUCCESSFUL IMPLEMENTATION OF BUSINESS INTELLIGENCE AS A TOOL FOR COMPANY MANAGEMENT

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INTRODUCTION

Nowadays, situation on the markets is not easy for companies. The openness of economies brings more competitive environment. To succeed on the market, companies need to make right decisions in the right time within business strategies. For the right decisions, relevant information are necessary. In the knowledge age or in the digital age data, the value of data and information is very high. With the growth of importance of the information, there is a strong impact on their value, range, quality and quantity in different forms. The quality of information is the basis for decision making at the strategic or operational level. Their processing within the required decisions must be made quickly, often in real time and usually requires some automated support. This task is carried out by Business Intelligence (BI), which becomes an important support tool for decision and an integral part of the daily work of managers, analysts and executives across the enterprise.

1 WHAT IS BUSINESS INTELLIGENCE (BI)

Business Intelligence (BI) becomes an important part of effective business management. They are designed to improve decision of managers in enterprises. BI system is a complex task, technology and applications of information systems, which are strongly supported by analysis and planning activities of enterprises and organizations and are based on the principle of multidimensionality, which means the ability to look at the reality of several possible perspectives [2].

The need for the implementation and use of Business Intelligence currently derives mainly from the high demands placed on managers of enterprises. In an environment of increasingly fierce competition where business managers and analysts need to make decisions under time pressure and at the same time with high responsibility. For relevant decisions, they need to be given relevant and objective information that would be available quickly, with minimal technical complexity of handling and taking with rapidly formulate new demands for further information corresponding to the current situation of the business [5].

BI represents the processes, technology and tools needed to transform data into information, information into knowledge and knowledge into plans of action to promote profitable business. BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex and competitive information to planners and decision makers. Implicit in this term, the primary objective of BI systems is to improve the timeliness and quality of the input to the decision making process [10]. Data is treated as a corporate resource, and transformed from quantity to quality [6]. Hence, actionable information could be delivered at the right time, at the right location, and in the right form to assist individual decision makers, groups, departments, divisions or even larger units [6].

Business intelligence (BI) presents a collection of decision support technologies for the enterprise aimed at enabling knowledge workers such as executives, managers, and analysts to make better and faster decisions [3]. For the financial management professionals, BI success means to have a precise understanding of the relationship between operational performance and financial results, better tools for performance management, high-quality, easily accessible historical facts for planning, forecasting, and budgeting; and better information and analytical tools for managing working capital [2].

From the business (organizational) perspective, BI systems mean specific philosophy and methodology that refer to working with information and knowledge, open communication, and knowledge sharing along with the holistic and analytic approach to business processes in organizations. Business Intelligence systems are assumed to bring solutions that are responsible for transformation of data into information and knowledge, and they also create some environment for effective decision-making, strategic thinking, and acting in organizations [11].

Business Intelligence is a set of processes, applications and technologies designed to support the decision-making processes in the enterprise efficiently. Key support of the analysis and planning activities of enterprises and organizations is built on the principles of multidimensional views of business data. BI applications cover analysis and planning functions of most areas of corporate
governance; marketing, sales, purchasing, financial management, controlling, human resource management, assets, production, information system (IS) or information-communication technology (ICT) and so on. In addition, BI applications are used in other areas such as supply chain management (SCM), customer relationship management (CRM), corporate performance management (CPM) and others [2].

BI systems are important in terms of their top position in the information systems business decisions pyramid. BI represents an extension of the term Information Systems (ISP) type of enterprise resource planning (ERP), including SCM and CRM, which are located on the lower level of corporate governance (fig 1).

Fig. 1: Location of BI in the pyramid of enterprise information system

Source: Čarnický, Mesároš, 2009 [2].

Correct identification of success factors of BI solutions should be based on a thorough knowledge of approaches to BI and from process of creating of BI in enterprises. In this process occurs in a variety of businesses obstacles, problems and risks that companies have to deal when setting up and using of BI. On the basis of profound knowledge these issues is then possible to identify the key success factors that directly affect on BI solutions [2].

1.1 APPROACHES TO BUSINESS INTELLIGENCE

At present, we can encounter three main approaches to solving BI. These approaches are largely dependent on the chosen and used BI architecture [12]. In examining approaches to BI and its treatment follows the definition and elaboration of approaches. There are three basic approaches to dealing BI:

- **approach of gradual building data marts, based on the architecture independent data marts** - is the oldest approach to dealing with BI. The principle of the solution is independent the creation of data marts for individual units (such as divisions, branches, etc.),
- **approach of single building an overall solution, based on consolidated data warehouse architecture** - it’s a gradual approach of building data marts and is associated with the architecture of a consolidated data warehouse. Being the most complex solution, but it is also a solution, which is the most time consuming and financial resources,
- **incremental approach based on consolidated data warehouse architecture** - the youngest, first create the basic concept of BI across the enterprise, which is the basis of the whole system and then, if desired, the system expands. Now one of the most popular ways of the implementation BI in enterprises.
1.2 ARCHITECTURE OF BUSINESS INTELLIGENCE

In connection with the components and tools that are included in BI, there are different opinions. In addition to a broad understanding of BI content there is another view which sees BI as just one of the tools of data warehouses or marketplaces. In another part of the lecture, I will stick to the first broad understanding of BI content.

- source, production systems,
- Data Staging Area – DSA,
- Operational Data Store (ODS),
- Extraction Transformation Loading (ETL),
- Enterprise Application Integration (EAI),
- Data Warehouses (DW),
- Data Marts (DMA),
- reporting,
- On Line Analytical Processing (OLAP),
- Data Mining (DM),
- Executive Information Systems (EIS),
- managerial applications,
- tools for metadata management
- tools to ensure data quality,
- other.

Fig. 2: Typical business intelligence architecture

![Typical business intelligence architecture](Source: Chaudhuri et al, 2009 [12])

2 FACTORS AFFECTING THE SUCCESSFUL IMPLEMENTATION OF BUSINESS INTELLIGENCE

A successful implementation of BI system provides these organizations with a new and unified insight across its entire engineering asset management functions [13]. Critical information from many different sources of an asset management enterprise can be integrated into a coherent body for strategic planning and effective allocation of assets and resources. Hence, the various business functions and activities are analyzed collectively to generate more comprehensive information in support of management’s decision-making process.

The implementation of business intelligence and the corresponding data warehouses is a complex process, which differs from case to case. According to Atre, every planned business intelligence solution must be justified by the potential benefits (for example: greater efficiency) it can bring to the organisation. This author defined four components that affect to success implementation of BI or affect to make a decision for implementation of BI. It is business factors, requirements of business analyses, cost and benefit analysisi and risk assesment [1].

In the Standish Group report, following critical success factors were defined [8].
- management support,
• users’ involvement,
• solution base,
• experience of a project manager,
• formal methodology,
• clearly defined business objectives,
• standardization of application infrastructure,
• minimized the scope of the project,
• stable,
• reliable estimate.

Another author who has tried to define or locate their critical success factors defined as follows[14]:
• the involvement and support of senior management,
• compliance BI strategy with the strategic goals of the organization,
• selection of a strong sponzor,
• existence of a vision for the area of BI,
• creation of a single language (BI unambiguous definition of terms),
• involvement of key staff all business units,
• the existence of data business model,
• creating an organizational structure for the management of BI (BI Competency Center),
• suitable and flexible architecture of BI solutions.

This review provides only overview of the key success factors for BI, which are presented by recognized authors in their work. These results are generalized and it was not was not possible to determine the severity of each success factor. Of course, in reality, these factors affect the success of BI implementation in a different way. If we consider the issue of the so-called critical factors, it is necessary to quantify the impact of individual factors. Factors and their impact on the success of implementation also partially related or vary with the industry in which it operates, therefore the detailed quantification of the impact of individual factors may vary depending on the sector.

In the case study by Dawsin, that was in the South African financial services sector, critical success factors were set as follows: user involvement, data quality, business champion, business case, top management support, business unit strategy, literacy, data classifications, financial resources, time restrictions and other. Survey involved 26 participants who participated in the implementation of BI in the enterprise. It was the Information or Business intelligence managers, BI professionals, project managers and other information technology staff. The total sample was 26 respondents who had to choose 5 key factors. In this study, as importantly, it appeared as follows (Fig. 3).

Fig. 3: Critical success factors of BI

![Critical success factors of BI](source: Dawson, L., Van Belle, 2013 [4])
Another point of the survey was on a scale from 1 to 5 rate the importance of selected factors that affect the most, while 1 means hardly important and 5 is very important. It was made the average mark. In figure 4 can also be seen denominations of participants that gave that value. It follows that the most important factor is the quality of information, IT influence on business strategy and user involvement.

**Fig. 4: Importance ratings for each critical success factor by average and detailed breakdown**

![Importance ratings for each critical success factor by average and detailed breakdown](image_url)

**Source: Dawson, L., Van Belle, 2013 [17]**

Yeoh et al. in its publications devoted to a similar survey, which sought to identify key factors in the successful implementation of BI. For this study, a Delphi panel composed of fifteen experts in BI systems EAMOs was established. All participants have been substantially involved in the implementation of BI systems within EAMOs in Australia and the United States. In the study were evaluated similarly as in the previous case, a sign of the importance of individual factors on a scale from 1 to 5, where 1 is hard important and 5 is very important (fig. 5) [13].

**Fig. 5: Ratings of critical success factors by Delphi participants**

![Ratings of critical success factors by Delphi participants](image_url)

**Source: Yeoh et al, 2008 [13]**
The most important criterion is committed management support and sponsorship. BI implementation process is difficult and requires resources that are necessary for implementing the system. Similarly, the management support is essential in this process. Another key factor is business user-oriented change management and clear business vision and well-established case [13].

Having a clear vision and measurable goal is the foundation of any changes. Even before the introduction of BI, business needs to know what to expect and in what should be a new system of benefits. Similarly, persons who are directly or indirectly involved in the implementation must know the tasks that await them and the same benefits that their new system will bring. The disadvantage of this survey is the fact that it was a variety of businesses that operate in different sectors.

Every BI implementation also brings some expectations. An important success factor was the clear business strategy and vision. Therefore, it is important to know the benefits that businesses expect after implementation. M. Hannula and V. Pirtimäki 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 6.

**Fig. 6: Benefits expected from BI activities**

<table>
<thead>
<tr>
<th>Benefit</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Better Quality Information</td>
<td>95%</td>
</tr>
<tr>
<td>Better Observation of Threats and Opportunities</td>
<td>83%</td>
</tr>
<tr>
<td>Growth of Knowledge base</td>
<td>76%</td>
</tr>
<tr>
<td>Increasing of Sharing Information</td>
<td>73%</td>
</tr>
<tr>
<td>Improved Efficiency</td>
<td>65%</td>
</tr>
<tr>
<td>Easier Information Acquisition and Analyses</td>
<td>57%</td>
</tr>
<tr>
<td>Faster Decision-making</td>
<td>52%</td>
</tr>
<tr>
<td>Time-saving</td>
<td>30%</td>
</tr>
<tr>
<td>Cost-saving</td>
<td>14%</td>
</tr>
</tbody>
</table>

*Source: Hannula, M. Pirtimäki, 2003 [7]*

Among the most anticipated benefits, we can include 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.

**CONCLUSION**

Benefits brought by using information and communication technologies for business management are significant. Innovative approaches, which inherently includes the BI as a tool for effective management, are very beneficial for the future performance and success of enterprises. It is necessary to identify the key success factors of implementation of BI solutions. The studies, which were approximated in this paper, identified several critical success factors of the implementation of BI. For instance, the support of top management, user involvement, business strategy and vision is essential when implementing the BI solution. This survey consisted of the data from various sectors, therefore it represents the different approaches in focusing on key areas and success factors when implementing BI. Data from different sectors and thus the results may reflect the need of identification of critical factors for successful implementation of BI for company itself. For a deeper analysis, it is necessary to obtain data and conduct the detailed research focused on a specific industry, the market in which the companies operate. In another case, these factors may be the same or very similar, but may vary in their influence on the success of implementation. Ultimately, the use of BI as a tool for effective management of enterprises is beneficial and brings the profit and competitive advantages.

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Abstract

The paper discusses the current issue of the implementation of Business Intelligence in companies as an innovative tool for working with information and supporting the decision making. For successful implementation of Business Intelligence, critical success factors need to be identified. It is not enough only to identify the success factor, but it is necessary to quantify their impact. Based on data from different studies, we have identified general success factors of the implementation of BI, which can vary from the sector in which the company operates. In general, Business intelligence was shown clearly beneficial for business management and efficient use of enterprise resources in several industries.

Key words

Business Intelligence (BI), implementation, critical success factor

JEL Classification

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