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Antoaneta Butuza, Ileana Hauer, Cornelia Muntean, Adina Popa

Increasing the Business Performances using Business Intelligence

Business intelligence is a concept that arose twenty years ago from decision support, which were designed for directors, managers and their supporting analysts. Since then, organizations have come to realize that decision-makers at all levels in all parts of the organization need access to timely, relevant and accurate information, whether in a call centre, sales office, shop floor, retail outlet or logistics department. The paper explores the concepts of BI, its components, emergence of BI, benefits of BI, factors influencing BI, technology requirements, and various BI techniques.

Keywords: *Business intelligence, decision-makers, business decisions*

1. Introduction

Business Intelligence (BI) is an umbrella term that combines architectures, tools, databases, analytical tools, applications, and methodology (Raisinghani, 2004). The term of Business Intelligence was introduced by Gartner Group in the middle '90s. However, the concept is much older; it has its roots in the MIS reporting system of the 1970s. During that period, the reporting systems were statically, bi-dimensional and having no analytical capabilities (Zaman, 2009). Development of Business Intelligence systems type was determined by requests of dynamic multidimensional systems able to support the intelligence decisional processes and having predictable abilities. These systems became more and more complex, performing multidimensional analyses of data, having statistical and predictive analyses capabilities in order to serve better for decisions analyses.

Stackowiak et al. (2007) define business intelligence as the process of taking large amounts of data, analyzing that data, and presenting a high-level set of reports that condense the essence of that data into the basis of business actions, enabling management to make fundamental daily business decisions. BI tools are seen as technology that enables the efficiency of business operation by providing

an increased value to the enterprise information and hence the way this information is utilized

Business Intelligence systems have an architecture composed from a collection of applications and integrated operational databases, and from decisions assisting systems that facilitates access to data.

The figure 1 illustrates the various tools and techniques that may be included in a BI system. Also, the figure 1 illustrates the evolution of BI.

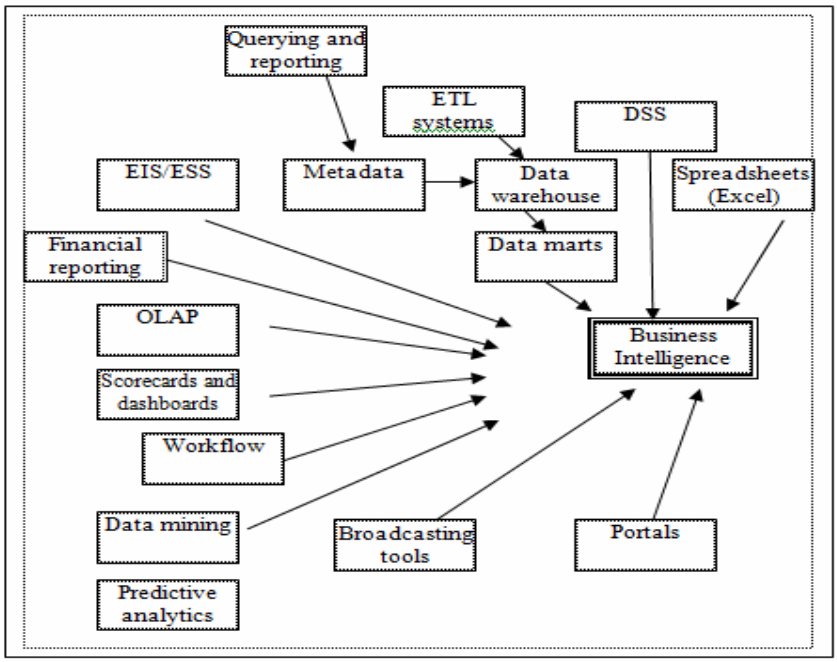

Figure 1. Evolution of BI (Source: Turban, et al., 2007)

2. Material and method

Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining.

The BI systems are integrated systems, which comprise in their architecture some of the most advanced information technologies: data warehouse, ETL (Extract, Transform, Load) and EAI (Enterprise Application Integration)

instruments, OLAP (On Line Analytical Processing) and data mining tools, are some examples of technologies capable to provide integration, storing, analyzing and reporting functions. They have to cover the whole process of turning data into information and knowledge: data gathering, cleansing, integration and storing, predictive analyses, querying and reporting.

The data warehouse concept represents a logical architectural approach for extracting the operational data and turning them into accurate historical information, in order to help the decision process. The data warehouse technology enables the integrating and the storing of large data volumes, both from internal and external sources. The fundamental criterion for data organization in a data warehouse is the subject (the business line). The purpose of such a system is to provide to the analysts an integrated and consistent view over the relevant data of the organization.

An *OLAP* instrument is a combination of analytical processing procedures and graphic presentation (the user's interface). OLAP instruments enable complex computations and provide users with the possibility to access and analyze large data volumes, the relations among them, and to present the data from various views (a multidimensional outlook of data).

Data mining is a technology that uses complex algorithms for data analyzing and discovering valuable information for the decision makers and analysts. Thus, special algorithms are used, such as fuzzy logic, neural networks, induction, clustering, that correlate the information from the data warehouse and support the analysis and decision process. By means of statistical analysis or artificial intelligence methods, the data mining techniques enable the users to identify patterns, rules and correlations among data and to create predictive models which can anticipate behaviors or events on the basis of the trends highlighted in the data.

Business Intelligence is an iterative process: it starts from the operational medium from where the data are extracted and deposited in data warehouses; then the deciding person uses decision assisting systems to extract data from the data warehouse (Giovinazzo, 2002). Detaining this information, a deciding person can create action plans. The change of the operational information level induces to a new iteration of Business Intelligence cycle. We represent the cycle in figure 2.

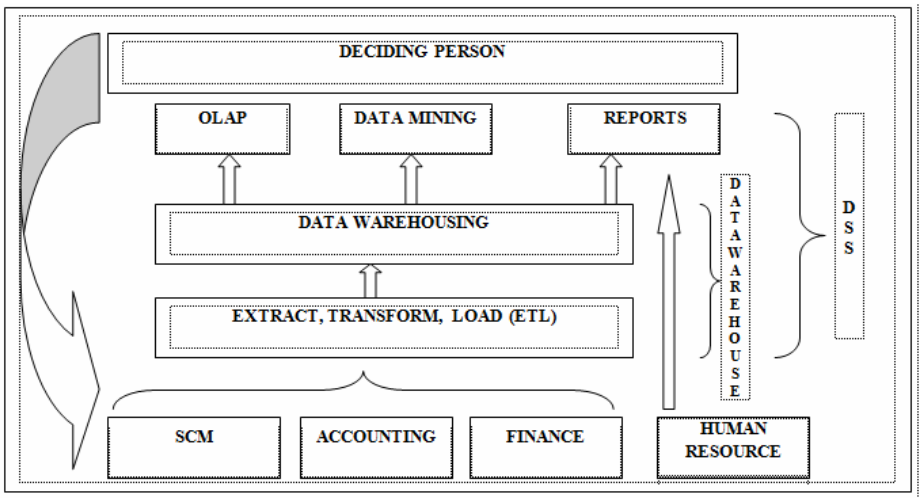

Figure 2. Business Intelligence Cycle (Source: Giovinazzo, 2002)

A BI system has four major components: *a data warehouse*, with its source data*; business analytics*, a collection of tools for manipulating, mining, and analyzing the data in the data warehouse; *business performance management* (BMP) for monitoring and analyzing performance; and a *user interface* (e.g. a dashboard). We underline that the data environment is mainly the responsibility of technical staff, while the analytical environment (also known as business analytics) is the realm of business users. Any user can connect to the system via the user interface, such as a browser, and top managers may the BPM component and also a dashboard.

Now we emphasize some benefits of BI. Thomson (2004) reported the following to be the major benefits of BI, based on the results of a survey:

- Alignment of an organization around a consistent set of Key Performance Indicators (KPIs) and Metrics
- Quicker, fact-based decision making.
- Simplified graphical presentation of KPIs and metrics.
- Reliable presentation of information ('One version of the truth').
- Combination of multiple data sources (ERP, CRM, Spreadsheets, Budgets...).Faster collection and dissemination of information.

3. Results and discussions

Business intelligence allows different data sources to be sliced, diced and mixed to produce real-time analysis of everything from different teams' productivity to different products' margins in colorful graphics with instant alerts on budget variances, late orders or critical ratios.

A Business Intelligence solution, optimal from the quality-price point of view, used in decision making is Microsoft SQL Server 2005 (or 2008), due to its performances in managing a large volume of data and to the facilities for reporting and multidimensional analyze, available using its components. Microsoft SQL Server 2008 offers to the users an extended set of tools that can be classified in the following categories, according to their functions:- support for client-server environment;- specific facilities for data storage in warehouses and multidimensional databases;- tools for OLAP and Data Mining multidimensional analysis;- tools to transform and import/export data;- integrated security, configurable and easy to use;- tools for data advanced presentation and reporting.

For the development of application for decision making, Microsoft offers Business Intelligence Development Studio, a development environment built on the productive framework of the development system Microsoft Visual Studio, which incorporates debugging facilities, together with a favorable environment for building cubs, reports, extracts, transformation and package load (ETL).

4. Conclusions

More and more organizations use Business Intelligence solutions and are aware of the utility of information, knowledge and models that can be obtained from data warehouses and used in the decision making process to increase the business performance. At the end of the paper we emphasized the main areas in which Business Intelligence solutions offered by Microsoft SQL Server 2005 are successfully used.

A key goal of the SQL Server 2005 Business Intelligence components is to support the development and use of business intelligence in enterprises of all sizes, and to all employees – not just management and analysts, but also operational and external constituents.

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Addresses:

- Lect.dr.Antoaneta Claudia Butuza, West University of Timisoara, Str. J.H.Pesrtalozzi, nr.16, 300115,Timisoara antoaneta.butuza@feaa.uvt.ro
- Asist.dr. Ileana Hauer, West University of Timisoara, Str. J.H.Pestalozzi, nr. 16, 300115, Timisoara, ileana.hauer@feaa.uvt.ro
- Conf.dr. Cornelia Muntean,West University of Timisoara, Str. J.H.Pesrtalozzi, nr.16, 300115,Timisoara cornelia.muntean@feaa.uvt.ro
- Lect. Dr. Adina Simona Popa, "Eftimie Murgu" University of Reşiţa, Piaţa Traian Vuia, nr. 1-4, 320085, Reşiţa, a.popa@uem.ro