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BUSINESS INTELLIGENCE: APPLICATIONS, TRENDS, AND STRATEGIES

LUMINIȚA HURBEAN*

Business Intelligence: aplicații, tendințe şi strategii

Abstract

Ever since mainframe computers began accumulating vast storehouses of data in the 1970s, managers and executives have sought ways to turn random facts and figures into useful information upon which to base reliable business decisions.

But it wasn't until the introduction of relational databases and client/server technology in the 1990s that companies took advantage of the market's need for decision support systems to create and define a new industry, which is now widely known as business intelligence (BI). Business intelligence allows organizations to extract useful, actionable information from a rapidly growing inventory of disparate data sources, including multiple database platforms, packaged applications, data warehouses, data marts and e-business systems.

The purpose of this paper is to point out the essentials of Business Intelligence in connection to the ERP system, the evolution of the concept and the benefits of its implementation in the enterprise information system. Finally, we will make some considerations on the adoption of business intelligence applications.

Key words: business intelligence, ERP, analytics, OLAP, Corporate Performance Management.

1 Introduction

The Enterprise Resource Planning (ERP) concept is an growing one. As we like to say, "ERP is a journey, not a destination" [Fotache, 2004, p. 14]. ERP revolutionized the enterprise applications market in the 90s, but no one could envisage the subsequent development.

The new millennium dawn brought a new generation of enterprise applications, intended to be more customer-focused and to extend beyond the enterprise through e-commerce interaction and collaboration with business partners. The key to the Internet-driven, dynamic trade environment is *agility*. Thus, early ERP adopters discovered that implementing these systems was only **the first step** toward creating a competitive IT infrastructure. They and new users alike are now looking for significantly more comprehensive functionality – from *advanced planning and scheduling* (APS) and *manufacturing execution systems* (MES), to *sales force automation* (SFA) and *customer relationship management* (CRM), to *business intelligence* (BI) and different *e-business* tools to name only some – and demanding that they be integrated into their ERP system.

* Conferențiar doctor, Catedra de Informatică şi Statistică Economică, Facultatea de Ştiințe Economice, Universitatea de Vest din Timişoara, e-mail: luminita.hurbean@fse.uvt.ro

The new generation of enterprise applications goes beyond traditional transactional business functions by enabling organizations to deliver real-time performance analysis directly on the desktops of all business managers, for they can become more knowledgeable and proactive [Fotache, 2004, pp. 96-98].

2 Business Intelligence: another step in the ERP evolution

At first, organizations realized that to maximize the value of the information stored in their ERP systems, it was necessary to extend the ERP architectures to include more advanced reporting, analytical and decision support capabilities.

While relational databases, presently used by ERP systems, are capable of retrieving a small number of records in short time, they are not good at retrieving a large number of records and summarizing them on demand. Most ERP products have a valuable database, but, translating the data stored to information useful for decision making process has proven difficult. With the availability of *analytic solutions*, several dozens of ERP providers can offer their customers a valuable tool for harvesting the business value out of their database. Thus, major ERP vendors have been increasingly embracing OLAP (*On-line Analytical Processing*) tools that provide a high-level aggregated view of data.

Various analytics and business intelligence solutions enable organizations to track, understand, and manage enterprise performance; they leverage the information that is stored in corporate databases or data warehouses, legacy systems, and other enterprise applications.

Contrary to traditional core ERP, business intelligence and analytics provide an environment in which business users receive information that is reliable, consistent, understandable and easily manipulated. Because executives and middle management have always had a need to understand their business' performance regardless of good or bad economic times - while the output from BI might change, the need is always there. The classical three level business intelligence pyramid shows the instruments frequently used by managers in different echelons – see figure 1.

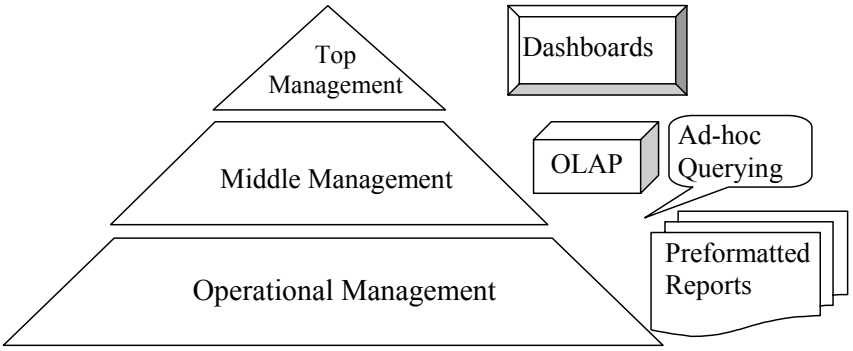

Fig. 1 Business Intelligence tools

Given that the BI tools have neither been terribly complex nor expensive to deploy, but have still been helpful in easing the decision-making process, in the recent years they have become considered necessary rather than as a luxury.

The latest evolutionary step introduces the concept of **corporate performance management** (CPM), also referred to as *enterprise performance management* (EPM) or *business performance management* (BPM), which is an emerging portfolio of applications and methodology with business intelligence architectures and technologies at its core.

Historically, BI applications have focused on measuring sales, profit, quality, costs and many other indicators within an enterprise, but CPM goes well beyond these by introducing the concepts of management and feedback, by embracing processes such as planning and forecasting as core tenets of a business strategy.

So, CPM is the evolutionary combination of technology and business philosophy, built on the basis of BI technology and applications that many enterprises have already implemented (see figure 2). The demand for these applications lies in the fact that they add value to previously installed enterprise applications, to a degree that the enterprise may finally see some long delayed benefits and feel better about implementing ERP systems and BI solutions.

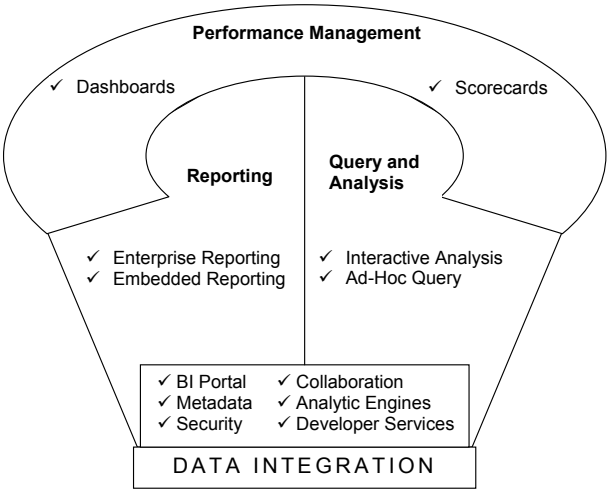

Fig. 2 Business Intelligence Tools and Technologies

CPM crosses traditional department boundaries to manage the full life cycle of business decision-making. It involves mapping a structured set of data against predefined reports, alerts, dashboards, analysis tools, key performance indicators (KPIs), etc., to monitor and improve business processes based on the upfront established corporate strategic objectives. Further, CPM creates a closed-loop process, starting with developing high-level corporate goals and subsequent predefined KPIs, through measuring actual results against the KPIs and representing this comparison in a scorecard, with the results reported to management through intuitive reporting tools, and ultimately delivering these results back into the business modeling process for corrections in the next planning cycle.

CPM augments BI applications, traditionally focused on measurement – mostly useless without the ability to act on it! CPM represents a renewed focus on quantitative management, a "management by numbers" method using insight gained from data analysis and performance reporting [Cowan, 2004].

3 Business Intelligence benefits and challenges

Whole pages can be written to answer the first question but a compressed answer shows that BI allows businesses:

- to leverage their information assets as a competitive advantage,
- to better understand the demand side of the business and manage customer relationships,

- and to monitor results of change – both positive and negative.

There are thousands of articles, white papers, books, vendors, and consultants dedicated to Business Intelligence. BI is listed among the top 10 technologies in 2005. Motive? Because businesses today are moving "at the speed of information" as analysts like to say. And because the economy demands it – companies are struggling to survive the economic storm, by reducing costs or increasing revenues.

BI solutions enable decision-makers to launch queries against the various data sets that are captured during the course of everyday business transactions: financial transactions, customer records, inventories, sales, production, etc. By analyzing these data in various ways, managers can discover trends, compare results, spot anomalies, and experiment with „what if" scenarios. BI has thus become the quintessential enabling technology for effective business management.

Howard Dresner, father of the Business Intelligence concept, explains why enterprises must make business intelligence an imperative: "Doing business is information-intensive. Enterprises are being pushed to share information with increasingly more audiences. The business intelligence imperative insists we elevate BI to a strategic initiative now, or risk disaster!" [Dresner, 2001]. He stresses the immense risk of not knowing and the worst of incomplete information compared to no information. BI attempts to eliminate guessing and ignorance in enterprises by leveraging the huge volume of quantitative data gathered every day in a variety of corporate applications.

Nowadays, popular uses of BI include management dashboards and scorecards, collaborative applications, workflow, analytics, enterprise reporting, financial reporting, and both customer and supplier extranets. These solutions enable companies to gain visibility into their business, acquire and retain profitable customers, reduce costs, detect patterns, optimize the supply chain, analyze product portfolio, increase productivity and improve financial performance.

4 Some aspects about Business Intelligence implementation

An enterprise should go through **two phases** before it is ready for BI. The first phase refers to the implementation of a solid transaction system; an integrated system like ERP, if possible. Its major aim is to create an OLTP system for collecting, storing, and updating transactional data in relational databases. Initially, these systems were reduced to the finance and accounting area – the market offered lots of financial accounting applications. Then, other types of applications were added: sales, procurement, inventory management, human resources management, and so on. Sometimes companies used different solutions from different vendors, or they combined it with domestic software, so they faced the problem of multiple data sources. The second phase is meant to solve the problem of asynchronous master data. The upgrade to integrated systems became crucial as the number of modules significantly increased.

There are two types of BI implementations:

- Implementing BI applications with the standard functionality, for creating simple, multidimensional OLAP cubes. It often reduces to an OLAP module which includes a set of predefined multidimensional models for analysis of different types of data. The data are available in the OLTP system. Oracle, Microsoft, or Business Objects (recently entered Romania) offer the most popular tools for creating OLAP modules.
- Development of more sophisticated analytical models, in order to reflect the unique mix of the company's targets and factors of influence. Developing a

"home-grown solution" is a good choice when functional criteria are not met by standard applications and there is a wish for total integration within the existing planning and control and/or knowledge management procedures, methodologies, and tools within the enterprise.

Recommendations for BI applications should be based on a company's functional requirements, budget, technical architecture, and overall user need. Selecting and implementing the right BI is a challenging job. Implementing BI is a costly and time consuming venture. If the wrong BI is implemented without good research and planning it could be a failure initiative. One very important point to be considered for selecting BI is there should be a close match between company's requirements and vendors provided solutions.

5 Conclusions

Today's organizations are relying on Business Intelligence applications to provide them with hard facts that help them make better, more informed decisions to obtain unforeseen rewards.

We can conclude that their success in business depend on the implementation of BI systems. The vast amounts of data, growing at 30-50 percent a year [Baxter, 2005], the increasing burden of government regulation and compliance obligations, competition and customer demands are focusing attention on the need for timely – and often real-time – information, and in plenty of detail. The issues that should be addressed in order to *successfully integrate BI into the enterprise* are:

- prepare a *solid foundation with the ERP system in the core*, so as to take care of the purity of the data sources (data quality),
- identify *where, who, and when BI is needed* in harmony with the established business objectives, in an attempt to prevent the "shelfware" – unused or underused software, sitting around in enterprise,
- keep in mind the necessity for set up *a common BI platform of integrated tools*, with the intention of avoiding the "BI islands" – different applications that can't communicate with each other,
- *integrate BI into enterprise portals* or keep this option open for the near future, as users have different roles across the enterprise, and use different applications – they should have the BI they needed, integrated to fit their job function.

Last, but not least, large enterprises should tackle BI *strategically*, because they have valuable data that can tell them about performance, customer behavior, process efficiency, and important trends. There are a lot of companies with a tactical view of BI: specific BI/analytical applications implemented in some departments or as part of some other application. For many of them it is difficult to implement BI strategically, as this approach forces the enterprise to reflect upon itself and how it actually work. Another reason that can be mentioned here is the cultural profile of the organizations – the resistance to change and the fear of what they might learn are serious challenges for BI strategic projects.

Final conclusion: businesses can create intelligence from their data and provide timely, accurate access to their end users. Business Intelligence is the latest buzzword working its way through the business and technology worlds. Much like ERP, SFA, and CRM before it, *the hype is now shifting toward Business Intelligence*.

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