Chapter 15
Overview of Business Intelligence through Data Mining

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ABSTRACT

The advent of information technologies brought with it the availability of huge amounts of data to be utilized by enterprises. Data mining technologies are used to search vast amounts of data for vital insight regarding business. Data mining is used to acquire business intelligence and to acquire hidden knowledge in large databases or the Internet. Business intelligence can find hidden relations, predict future outcomes, and speculate and allocate resources. This uncovered knowledge helps in gaining competitive advantages, better customer relationships, and even fraud detection. In this chapter, the authors describe how data mining is used to achieve business intelligence. Furthermore, they look into some of the challenges in achieving business intelligence.

INTRODUCTION

The tremendous advancements made in data mining (DM) technologies have shifted thought from data collection to knowledge discovery and collection (Desikan et al., 2009). With today's powerful and relatively inexpensive hardware and network infrastructure, matched with advanced software, enterprises are adopting data mining as essential business processes. In addition, the Internet plays an integral part as networks and communications are ubiquitous today, and data mining is carried over the world through networked databases. The vast amount of knowledge is not only consumed at the top senior management level but at all the other levels of an enterprise as well. Current data mining software utilize complex algorithms to achieve pattern recognition and forecast complex stock market activity, as example of the many usages of data mining. Currently, IBM and Microsoft are competing to dominate the data mining software market; this is also influenced by security and

intelligence agencies such as the FBI and CIA. Beside business intelligence, data mining acquires security-related intelligence. Many surveyors, such as Gartner group, one of the main pioneers in business intelligence, predicted that more than 5 billion dollars of business will be the net worth of e-commerce in the coming years (MineIT, 2010).

Acquiring business-oriented information through data mining is referred to as *business intelligence* (BI). BI tools are now an integral part of most enterprises' decision making and risk management. Enterprise datasets are growing rapidly every day, thanks to the use of Information Systems (IS), and data warehousing technologies. On average, investment and credit card companies usually have millions of transactions logged per year (Dorronsoro, Ginel, Sanchez, & Cruz, 1997). Datasets generated by global telecommunications operators can collect up to 100 million users' data, each generating thousands of millions of data per year (Phua, Lee, Smith, & Gayler, 2010). As these numbers mount up annually, traditional analytical processing such as OLAP and manual comprehension seems ineffective or to some extent impossible. With BI, such tasks are within

reach; according to Gartner group, "data mining and artificial intelligence are at the top five key technology areas that will clearly have a major impact across a wide range of industries within the next three to five years." This was back in a 1997 report (Lee & Siau, 2001). BI has become the stable for decision support systems in large organizations. BI has dominated many industries including retail, banking, and insurance (Ramakrishnan et al., 2011). It's worth mentioning that BI software is aimed at knowledge workers, mainly executives, analysts, middle management, and to a lesser extent operational management. Figure 1 illustrates how data today is transformed to acquire BI.

This chapter will explore how DM is used to achieve BI. First, we shall explore the background and the many developments that led to the inception of BI. And then, we shall look into the basics behind DM. afterwards, we will discuss how to achieve BI. After that, the chapter will address the problem of gaining competitive advantages through the use of BI. How the impact of BI on modern business and its effects on the return on investment (ROI) will be discussed, and then,

Figure 1. Data transforming into business intelligence
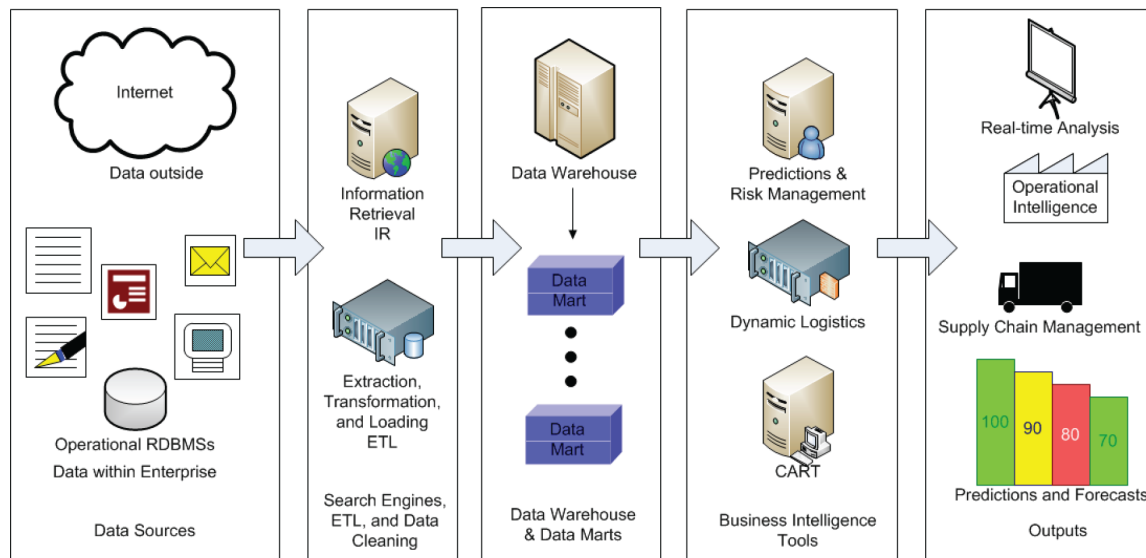
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