INTRODUCTION

The amount of information that decision makers have to process has been increasing at a tremendous pace. A few years ago it was suggested that information in the world was doubling every 16 months. The very volume has prevented this information from being used effectively. Another problem that compounds the situation is the fact that the information is neither easily accessible nor available in an integrated manner. This has led to the oft-quoted comment that though computers have promised a fount of wisdom they have swamped us with a flood of data. Decision Support Systems (DSS) and related decision support tools like data warehousing and data mining have been used to glean actionable information and nuggets from this flood of data.

BACKGROUND

Dhar and Stein (1997) define Intelligence Density (ID) as the amount of useful “decision support information” that a decision maker gets from using a system for a certain amount of time. Alternately ID can be defined as the amount of time taken to get the essence of the underlying data from the output. This is done using the “utility” concept, initially developed in decision theory and game theory (Lapin & Whisler, 2002). Numerical utility values, referred to as utilities (sometimes called utiles) express the true worth of information. These values are obtained by constructing a special utility function. Thus intelligence density can be defined more formally as follows:

$$\text{Intelligence Density} = \frac{\text{Utilities of decision making power gleaned (quality)}}{\text{Units of analytic time spent by the decision maker}}$$

Increasing the intelligence density of its data enables an organization to be more effective, productive, and flexible. Key processes that allow one to increase the ID of data are illustrated in Figure 1. Mechanisms that will allow us to access different types of data need to be in place first. Once we have access to the data we need to have the ability to scrub or cleanse the data of errors. After scrubbing the data we need to have tools and technologies that will allow us to integrate data in a flexible manner. This integration should support not only data of different formats but also data that are not of the same type.

Enterprise Systems/Enterprise Resource Planning (ERP) systems with their integrated databases have provided clean and integrated view of a large amount of information within the organization thus supporting the lower levels of the intelligence density pyramid (Figure 2).

But even in the biggest and best organizations with massive investments in ERP systems we still find the need for data warehouses and OLAP even though they predominantly support the lower levels of the intelligence density pyramid. Once we have an integrated view of the data we can use data mining and other decision support tools to transform the data and discover patterns and nuggets of information from the data.

MAIN THRUST

Three key technologies that can be leveraged to overcome the problems associated with information of low