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Chapter 4

Justifying Data Warehousing Investments

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Organizations are increasingly recognizing the importance of information technology. Many large IT projects in the area of data warehousing and data mining have been taken up in the last few years. While many data warehousing and data mining projects have resulted in interesting business benefits, there are also many examples of cost and schedule overruns and dissatisfaction regarding the results from these projects. A recent issue of Information Week *(May 24, 1999) reported that organizations are carefully scrutinizing the returns from large data warehousing projects. This makes it increasingly important for information systems professionals to understand the payoff from data warehousing investments. It is also extremely important for information systems professionals to articulate the business benefits of data warehousing and other big ticket information technology projects in terms that senior managers in general and finance executives in particular can relate to. This article outlines an approach to justifying data warehousing investments that is based on the concept of options in finance. This approach to justifying investments is being increasingly recognized as being superior to traditional methods by finance professionals (*Business Week, *June 7, 1999).*

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OPTIONS

This section briefly describes a financial call option, which is one type of a financial option. A financial call option is a right, but not an obligation to buy a financial asset (such as a share). For example, one could acquire an option to buy 1,000 shares of AMAZON.COM stock at $150 on 3/1/2000 by paying a certain amount of money (say $10,000) since financial options are traded. The value of this option depends on the expected price of AMAZON.COM on 3/1/2000. Some people might be willing to pay $10,000 for this option if they expect the price of AMAZON.COM on 3/1/2000 to be high enough (higher than $160). They can then buy 1,000 shares of AMAZON.COM at $150 per share, sell them at a price higher than $160 and still make a profit that exceeds their initial payment of $10,000. It is important to realize that if on 3/1/2000 AMAZON.COM shares trade at less than $150, then the person who bought the option (the option holder) need not buy the 1000 shares of AMAZON.COM. The option holder would then lose $10,000 (the amount originally paid to acquire the option). Thus the person who buys the option stands to gain an indeterminate (potentially large) amount of money if the value of the underlying asset (AMAZON.COM stock) increases. However, losses are limited to $10,000 even if the value of the underlying asset drops significantly.

Techniques for valuing financial call options exist. The value of a financial call option thus depends on the expected value of the asset (stock) at the time of exercising the option. In addition, the value of call option is greater when there is more uncertainty surrounding the future value of the stock.

It is being increasingly recognized that the logic and techniques of financial option pricing are increasingly relevant to "real" investment projects or investment in non-financial assets such as information technology projects. The next section discusses the similarity between data warehousing investments and financial options.

THE DATA WAREHOUSING PROJECT AS AN OPTION

Investment in data warehousing projects can be considered similar to buying financial call options. The cost of the project is analogous to the cost of buying the option or the value of the option. In other words, an organization acquires an option by investing in a data warehousing project. This investment results in the option to get the business benefits of data warehousing on the date of completion of the project by using sophisticated OLAP and /or data mining techniques. The value of this option can be calculated (approximately) using techniques based on financial