



## **Chapter VI**

# **The Value of Managerial Flexibility in Strategic IT Investment: Identify the Real Options of Resource Allocation**

Xiaotong Li

University of Alabama in Huntsville, USA

John D. Johnson

University of Mississippi, USA

## **ABSTRACT**

*In this chapter, we discuss the real options theory and its applications in IT investment evaluation. We provide a framework within which the appropriateness of using real options theory in strategic IT investment evaluation is systematically justified. In our framework, IT investment opportunities are classified into four categories based on two criteria: the technology switching costs and the nature of competition. We point out that different real options models should be adopted for each category. The*

*electronic brokerage's investment decision in wireless technology is discussed as a real-world case within the framework. Our study also provides some insights about the relationship between technology standardization and IT investment decisions.*

## INTRODUCTION

Many information resource managers have learned to be proactive in today's highly competitive business environment. However, limited financial resources and many uncertainties require them to maximize their shareholders' equity while controlling the risks incurred at an acceptable level. As the unprecedented development in information technology continuously produces great opportunities that are usually associated with significant uncertainties, technology adoption and planning become more and more crucial to companies in the information era. Karahama et al. (1999) point out that the value-adding potential of the new technology in question is a critical factor in IT adoption. Raghunathan and Madey (1999) develop a firm-level framework for electronic commerce information systems (ECIS) infrastructure planning.

In this study, we attempt to evaluate IT investment opportunities from a new perspective, namely, the real options theory. Unlike the standard corporate resource allocation approaches, the real options approach acknowledges the importance of managerial flexibility and strategic adaptability. Its advantage over other capital budgeting methods like static discounted cash flow analysis has been widely recognized in analyzing the strategic investment decision under uncertainties (Amram & Kulatilaka, 1999; Luehrman 1998a, 1998b). Smith and McCardle (1998, 1999) further show that an option pricing approach can be integrated into a standard decision analysis framework to get the best of the both worlds. In fact, some previous IS researches have recognized the fact that many IT investment projects in the uncertain world possess some option-like characteristics (Clemsons, 1991; Dos Santos, 1991; Kumar 1996). Recently, Benaroth and Kauffman (1999, 2000) and Taudes, Feurstein and Mild (2000) applied the real options theory to real-world business cases and evaluated this approach's merits as a tool for IT investment planning. For a general discussion of the link between real options theory and IT investment planning, readers are referred to Campbell (2002) and Amram, Kulatilaka and Henderson (1999).

As all real options models inevitably depend on some specific assumptions, their appropriateness should be scrutinized under different scenarios. This study aims to provide a framework that will help IS researchers to better understand the real options models and to apply them more rigorously in IT investment evaluation.

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