

# Chapter 4.10

## Diffusion of Enterprise Resource Planning Systems in Taiwan: Influence Sources and the Y2K Effect

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### ABSTRACT

ERP was one of the important developments in the use of information technology for organizations in the 1990s. Y2K rectification was a key driver in the decision to move to ERP software. Based on diffusion-of-innovation models, in this study, the sources of influence of ERP adoption in Taiwan are investigated and if the dawning Y2K can be viewed as a critical point is explored. The results demonstrate that the main influence source of ERP adoption is a mix of influence sources for all adopters. Before the millennium, the internal model shows the higher power of explanation. And after the millennium, the main influences

become external influence sources. With different diffusion patterns between, before, and after the millennium, the analysis results confirm that the millennium is a critical point. Besides contributing to the application of diffusion-of-innovation in Taiwan's ERP adoption, the results of this study can provide suggestions for ERP suppliers' marketing strategy.

### INTRODUCTION

In the age of the information and knowledge, organizations depend heavily on information systems to support regular operations, solve problems,

and make flexible responses to the competition around the world. In the early stages, organizations tended to develop stand-alone systems for a single functional area or business unit; maintaining many different systems led to enormous costs. Organizations faced many problems because of the lack of integration, especially at the global level (Ives & Jarvenpaa, 1993). Recently, enterprise resource planning systems (ERP) which incorporate commercial software packages, also known as integrated enterprise computing systems, attempt to integrate all departments and functions across a company, constitute one of the fastest growing segments in the software market and one of the most important developments in recent years (Sprott, 2000; Seethamraju, 2005). Most of this was clearly attributable to the Y2K effect (Sprott, 2000). Y2K rectification was a key driver in the decision to move to ERP software (Scott & Kaindl, 2000).

The market for ERP software grew a surprising 14% in 2004 to become a \$23.6 billion business (Woodie, 2005). And in Taiwan, according to the investigation of MIC, the market for ERP grew from 2.1 billion NT dollars in 1997, to 4.6 billion NT dollars in 1998. During the year 2000, the ERP market grew 26% and the market scale was up to 7.7 billion NT dollars. Nevertheless, the ERP market has generated 9.5 billion NT dollars in year 2003 and only up to 9.8 billion NT dollars in year 2004. MIC indicated that the CAGR (compound annual growth rate) of the ERP market scale would reach 28% for 3 years after 2001, but also that the growth of the ERP market would decrease below 5% after 2004 (MIC, 2004).

The ERP system is the most important development in information technology use in the 1990s (Davenport, 1998). ERP systems have developed for several years, and the number of adoption firms is growing. The diffusion of innovation model (DOI model) is usually applied to explore the spread of new technology. For example, Anat, Ravi, and David (2004) applied the DOI model to investigate adoption of Internet standard IPV6.

The DOI model has the potential to investigate ERP adoption. The imitation hypothesis has generally guided researches on the organizational adoption of administrative innovations. The hypothesis states that, within a relevant population of firms, such adoption results in a predictable diffusion pattern. Members of a social system have different propensities for relying on mass media or interpersonal channels when seeking information about an innovation (Mahajan, Sharma, & Bettis, 1988; Rogers, 1995; Rogers, 2003).

In this study, the diffusion-of-innovation perspective to examine the impact of various forms of influence in the adoption of ERP in Taiwan is applied. First, the sources of influence (internal, external, and mixed) that could explain the diffusion pattern of ERP by adopting ordinary least square (OLS) estimation methods and specification tests are examined. Second, because previous research showed that the Y2K effect is a key driver for the adoption of ERP; the millennium is treated as a 'critical point' in delineating two regimes: "pre-millennium" and "post-millennium," to assess the different impacts of the influence sources within each of the regimes.

## **THEORETICAL PERSPECTIVES**

The theoretical perspectives begin with the introduction of ERP system and diffusion of innovation in first two sections, and then why the study regards ERP as an administrative innovation is explained in next section. This is followed by a description of three diffusion models, namely influence sources. In the end, the theoretical perspectives highlight the crucial role that Y2K has had in driving the diffusion pattern of ERP.

### **Enterprise Resource Planning (ERP)**

The term "ERP" was addressed first by the Gartner Group in the early 1990s. It evolved from MRP, closed-loop MRP in the 1970s and MRP II in the

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