

DIFFUSION OF ENTERPRISE RESOURCE PLANNING IN TAIWAN: INFLUENCE SOURCES AND MILLENNIUM EFFECT

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ABSTRACT

In this study, we try to investigate the influence sources of ERP adoption in Taiwan and to explore whether the millennium can be viewed as a critical point. The results demonstrate that the main influence source of ERP adoption is mixed influence sources for all adopters. Before millennium, the mixed model and the internal model show the same power of explanation. After millennium, the main influence is external influences sources. Different diffusion patterns between “pre-millennium” and “post-millennium”, the analysis results confirm the millennium is a critical point.

INTRODUCTION

The ERP market was one of the fastest growing and the most profitable areas of the software industry during the last three years of the 1990s. Most of this was clearly attributable to the Y2K effect [8]. Y2K rectify was a key driver in the decision to move to ERP software [7]. In Taiwan, according to the investigation of MIC (Market Intelligence Center), the market for ERP grew fast from 1997 to 2001. Also, MIC indicated that the CAGR of ERP market scale would reach 28% for three years after 2001, but the growth of ERP market will decrease below 5% after 2004 [5]. This study based on the researches of Loh and Venkatraman [1] and Mahajan et al. [3][4] applies the diffusion-of-innovation perspective to examine the impact of various forms of influence for the adoption of the ERP in Taiwan. Besides, we regard the millennium 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.

DIFFUSION-OF-INNOVATION

Since Rogers addressed the diffusion concept in 1962, the researches on the diffusion of innovations have resulted in a body of literature. According to Rogers’ definition [6, p.11], “An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption”. The perceived newness of the idea determines the individual’s action to it. “Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system” [6, p.5]. This definition reflects diffusion is a special type of communication, in which the messages are about a new idea [6].

Traditionally, in diffusion models, there are three basic models: internal influence (word-of-mouth or interpersonal communication), external influence (mass-media communication), and mixed influence [1][6][3]. We try to assess the influence type that captures the pattern of ERP diffusion. The first question of this research is: *What source of influence characterizes the diffusion of ERP best?*

The terms “Millennium effect” are used to signify the importance of the millennium critical point in driving the diffusion pattern of ERP. For this purpose, we consider the period— January 1997 to December 2000—as the first diffusion regime, and the period—January 2001 to December 2004—as the second diffusion regime. The second question is: *What source of influence characterizes the diffusion of ERP before and after millennium best?*

RESEARCH DESIGN

The sample comprises the companies of adopting ERP in Taiwan. The data are collected from the TTS (Transmission Text Retrieval System) Web Server. TTS is the products of Transmission Books and Microinfo Co., Ltd. (TBMC) . Table 1 showed these data (on 82 firms), and for year, provided the number of firms that adopted ERP system. Time-series adoption data are developed by the year function.

Table 1 Adoption data (Noncumulative).

Year	1997	1998	1999	2000	2001	2002	2003	2004
Number of adopters	1	1	11	24	15	13	11	6

Bass model assume that potential adopters of an innovation are influenced by two means of communication—mass media and word of mouth. In its development, it makes a further assumption that the adopters of an innovation comprise two groups. One group is influenced only by the mass-media communication (external influence) and the other group is influenced by the word-of-mouth communication (internal influence) [3]. Mahajan et al. [4] studied the adoption for the M-form organization structure; they used regression analogue equations to analyze for different models. The analytic method of study is based on Bass model and methods of Mahajan et al. [4].

Table 2. Parameter estimation of ERP diffusion.

Model	Coefficients*		
	β_2	β_3	r^2
White-noise	1.00	–	0.0623
external	0.8567	–	0.1232
mixed	1.00	-0.0055	0.1411
internal	1.1433	–	0.1122

RESULTS

Table 2 summarizes the parameter estimates and the fit statistics (r^2 values) for the three alternatives model and white noise model. The main source of the influence is mixed sources but no significant difference compared with internal and external model. Table 3 summarizes the parameter estimates and the fit statistics between pre-millennium (included) and post-millennium. The results show that mixed and internal resources have the same influence (equal r^2 value) before millennium. The main influence of post-millennium is the main influence source. It explains 64.3% variance.

Table 3. Parameter estimation of ERP diffusion before and after millennium

Model	Coefficients*(Before millennium)			Coefficients*(After millennium)		
	β_2	β_3	r^2	β_2	β_3	r^2
White-noise	1.00	–	0.2432	1.00	–	-1.5475
external	0.990	–	0.2346	0.7003	–	0.6429
mixed	2.2439	0	0.7766	1.00	-0.0001	-0.2397
internal	2.3529	0	0.7766	1.2997	-0.0157	-2.5343

DISCUSSION AND CONCLUSION

In this study, we view ERP as administrative innovation and explore the influence sources of the adoption of ERP in Taiwan by different diffusion models. From the results of analysis, the mixed model (Bass model) is fitter for total period. Before millennium, mixed model and internal model show the same power of explanation ($r^2=78\%$). The internal communication channel and the media reports about millennium have an important influence on ERP adoption before millennium. However, after millennium, the external influence sources are main influences ($r^2=64\%$). Media power and other external channels (such as consulting firms) have major influences on ERP adoption in this period. External diffusion model shows exponential distribution and slowly growing in later stage. Different diffusion patterns between pre-millennium and post-millennium, the analysis results confirm the millennium is a critical point.

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