Decision Support Systems 46 (2008) 149–157

Contents lists available at ScienceDirect

Decision Support Systems

journal homepage: www.elsevier.com/locate/dss

The implementation factors that influence the ERP (enterprise resource planning) benefits

Shih-Wei Chou [a,*], Yu-Chieh Chang [b,1]

[a] Department of Information Management, National Kaohsiung First University of Science and Technology, 2 Juoyue Rd, Nantz District, Kaohsiung 811, Taiwan, ROC
[b] Department of Marketing Management, Shu-Te University, 59, Hun Shang Rd., Yen Chao, Kaohsiung County, 82442, Taiwan, ROC

ARTICLE INFO

Article history:
Received 30 January 2007
Received in revised form 4 June 2008
Accepted 19 June 2008
Available online 1 July 2008

Keywords:
ERP implementation
Customization
Organizational mechanisms
Intermediate ERP benefits
Overall ERP benefits

ABSTRACT

Improving the performance of ERP systems remains an important issue. This study examines ERP performance at the post-implementation stage, particularly from the perspective of managerial intervention. Specifically, we proposed that both customization and organizational mechanisms affect intermediate benefits (including coordination improvement and task efficiency), which in turn influence overall benefits. A firm-level survey was used to collect data. Our findings support the proposed hypotheses. We also provide implications for both managers and researchers.

1. Introduction

Quite a few companies use a powerful information system (IS) such as ERP (enterprise resource planning) for handling complicated business applications, e.g., a diverse range of customer services. The reason ERP is so popular is that it can improve operational efficiency and business efficacy [8,10,15,27]. ERP improves operational efficiency by integrating business processes and providing better access to integrated data across the entire enterprise, while to enhance efficacy, a company may redesign its business practices by using the templates (or best practices) embedded in the ERP [5,16]. Despite low cost and risk, and high system quality of ERP [9], the failure rate of ERP implementation ranged from 40 percentage to 60 percentage [15].

The high failure rate of ERP implementation might be attributed to the difference in interests between customer organizations that aim to provide the optimum solutions for business problems and ERP vendors who prefer a generic solution applicable to a broader market [9,21]. In other words, how to bring organizational processes and functions into closer alignment with the best practice of ERP becomes critical. As prior work failed to address this in a systematic way, this study focuses on the salient factors that affect alignment. To this end, we used organizational information processing theory (OIPT) [11], which serves as an analytical lens to understand how alignment can be handled appropriately. Alignment is defined as the activities that aim for reducing uncertainty. Applying this to ERP context, the reason ERP enhances organizational performance is that the uncertainty about statuses of tasks and the environment is suitably addressed [21]. Quite a few factors may hinder the end-to-end connectivity of data and process and in turn lead to the uncertainty, such as organizational misfit (i.e. data, process, use) [22], organizational resistance [4], adaptation problems (ERP adaptation, or process adaptation) [9], and differentiation among sub-units [8]. While prior work argued that uncertainty can be addressed, such as intra-organizational standardization, or inter-organizational homogenization [2], they failed to address the uncertainty from the perspective of organizational intervention, particularly in the post-implementation stage of ERP. This study aims to fill the foregoing gap.

This study focuses on a post-implementation phase (or the acceptance stage of IS implementation) of ERP [1,21] because many firms have used ERP over a period of several years and the

* Corresponding author. Tel.: +886 7 6011000x4114; fax: +886 7 6011042.
E-mail addresses: swchou@ccms.nkfust.edu.tw (S.-W. Chou), andy@mail.stu.edu.tw (Y.-C. Chang).
[1] Tel.: +886 7 6158000x6302.

0167-9236/$ – see front matter © 2008 Elsevier B.V. All rights reserved.
doi:10.1016/j.dss.2008.06.003

success of the initial stage (i.e. the ERP implementation phase) does not necessarily lead to the benefits for the post-implementation phase [15]. Following Gattiker and Goodhue [8], the performance of a post-implementation phase is measured by both intermediate benefits and overall benefits. While Gattiker and Goodhue [8] argued that ERP performance, in terms of reducing information uncertainty, is affected by the original features possessed by sub-units of an organization such as interdependence and differentiation among sub-units, this study contends that ERP performance is also influenced by two salient interventions—organizational mechanisms (OM) [18] and customization [8,9]. The latter refers to the modification of ERP software when an organization is confronted with the misalignment between the process options offered by the ERP and the business process that the organization desires [22]. On the other hand, OM represents a variety of structured and unstructured interactions between technology (e.g. ERP) users and technology providers. In our context, OM refers to those activities aimed at improving organizational acceptance of the system by bringing organizational processes into closer alignment with the best practices of ERP.

To test the proposed model, we adopted a survey method of collecting data and assessing the hypotheses. The contributions of this study are two-fold. First, this study simultaneously identified two salient antecedents, customization and OM in terms of both strategic alignment and operational alignment, from which ERP performance can be improved. Second, following Gattiker and Goodhue [8], this study conceptualized ERP performance as intermediate benefits and overall benefits. We further delineated the relationships among customization, OM, and the foregoing benefits, including the mediating role of the intermediate benefits between the salient antecedents (i.e. customization and OM) and the overall ERP benefits. This is the first empirical study (to the best of our knowledge) exploring how post-implementation performance of ERP was affected by both customization and OM.

2. Research model and hypothesis development

2.1. Enterprise resource planning (ERP) systems

ERP refers to those ISs that aim for both standardization and integration of the business operations, from order capturing to accounting and procurement to warehousing [13]. The main role of standardization is to enforce the data consistency and the connections of activities related to certain business processes that occur simultaneously in various functions [8]. On the other hand, integration aims to connect information and processes of distinct sub-units of the organization [23]. With the help of the above features, business can achieve an "end-to-end" connectivity, thus, bringing various diverse functions and divisions together, which in turn improve performance.

2.2. Intermediate and overall ERP benefits in a post-implementation phase of ERP

Following Gattiker and Goodhue [8], this study measured ERP performance in terms of a two-stage model—i.e. intermediate ERP benefits and overall ERP benefits, because understanding the intermediate benefits helps us explain why certain overall effects do or do not occur. Several intermediate ERP benefits may affect the final firm-level ERP performance, such as coordination improvements, task efficiency [8], and operational performance [15]. Although the aggregate-level (or firm-level) trends and benefits can be observed and speculated about, quantitative empirical research has yet to offer a well-accepted explanation regarding the intermediate benefits that in turn affect the overall performance following ERP implementation. Specifically, ERP intermediate benefits were measured in terms of coordination improvement and task efficiency in this study [8].

Our research model is based on the premise that the salient antecedents that affect the standardization and integration should be carefully addressed, because they denote the main focus of ERP. Quite a few antecedents have been identified by prior work, including institutional isomorphism [2,15], organizational misfit/fit (data, process, use) [22], adaptation mechanisms (ERP or process adaptation) [9], characteristics of sub-units (e.g. interdependence and differentiation) [8], ongoing learning effects [21], and so on. In this study, customization and OM were chosen as the variables that may influence ERP benefits, because they may affect standardization and integration. In addition, in the post-implementation stage of ERP, organizations may rely on the intervention (such as customization and OM) that brings business processes into alignment with the best practices of ERP. Fig. 1 lists our research model.

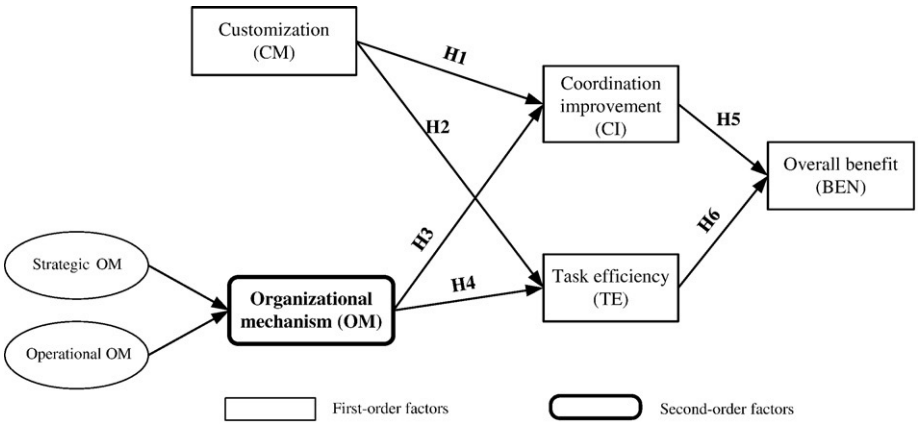

Fig. 1. Research model.