Acceptance of ERP Solutions in Maturity Use Phase: Key Influence Factors for SAP and Microsoft Dynamics NAV

Simona Sternad, Faculty of Economics and Business, University of Maribor, Maribor, Slovenia
Samo Bobek, Faculty of Economics and Business, University of Maribor, Maribor, Slovenia

ABSTRACT

Enterprise resource planning (ERP) solutions have been implemented in a lot of organizations in the past few years. Notwithstanding the fact that ERP solutions benefit organizations only to the extent that users accept and use them, most studies regarding ERP solutions today refer to selection and implementation process. The most widely used model in the area of investigating user acceptance is technology acceptance model (TAM) proposed by Davis (1989). In this paper, the TAM was extended to measure groups of extended factors (personal characteristics and information literacy, system and technological characteristics and organizational-process characteristics) that influence ERP acceptance. Because ERP solutions are implemented in different organization types and by different methodology, the authors also analyze external factors importance regarding user acceptance of two global solutions – SAP and Microsoft Dynamics.

Keywords: Enterprise Resource Planning (ERP), Lifecycle, Microsoft Dynamics Nest Asset Value (NAV), Partial Least Squares (PLS), Structural Equation Modeling (SEM), Systems Applications and Products in Data Processing (SAP), Technology Acceptance Model (TAM)

INTRODUCTION

Enterprise resource planning (ERP) solutions can be viewed as (1) a set of packaged application software modules, with an integrated architecture, that can be used by organizations as their primary engine for integrating data, processes, and IT in real time across internal and external value chains; (2) deep knowledge of business practices that vendors have accumulated and stored from implementations in a wide range of client organizations and that can exert considerable influence on the design of processes within new client organizations; and (3) a generic ‘semi-finished’ product with tables and parameters that client organizations and their implementation partners must configure, customize, and integrate with other computer-based IS to meet their business needs (Seddon, Shanks, & Willcocks, 2003). These solutions are “web enabled,” meaning they work using web clients; this makes them accessible to all of the organization’s employees, clients, partners, and vendors at anytime and from anyplace.

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thereby promoting the business units’ effectiveness (Motiwalla & Thompson, 2009). The ERP solution’s goal is to make information flow be both dynamic and immediate, thereby increasing the usefulness and value of the information. In addition, an ERP solution acts as central repository eliminating data redundancy and adding flexibility. In summary, ERP solutions are the mission-critical IS in today’s business organizations and solve the critical problem of integrating information from various sources both inside and outside the organization’s environment to make it available in real time to all employees and partners of the organization.

ERP solution adoption typically follows three lifecycle phases: selection, implementation, and operation, the latter of which can be divided into a stabilization stage and a routine stage. Most literature on ERP solutions is focused on either evaluating the appropriateness of the ERP solution vis-à-vis software, vendors, or consultants or identifying critical successful factors (CSF) affecting ERP selection and implementation (Yu, 2005); less effort has been given to identifying potential post-implementation impact (Gattiker & Goodhue, 2005; Sternad et al., 2011).

ERP solutions benefit organizations only to the extent that users accept and utilize them frequently and extensively. To improve the efficiency and effectiveness of ERP solutions in the operation phase, organizations need to research the factors that impact user satisfaction. In this area, the technological acceptance model (TAM) is widely used for explaining behavioral intent and usage; it can enhance understanding of the influences that increase the efficiency and effectiveness of ERP solution use (Shih & Huang, 2009). Several researchers have applied TAM to examine ERP solution use (e.g., Calisir, Gumussoy, & Bayram, 2009; Lee, Lee, Olson, & Chung, 2010; Shih & Huang, 2009; Sun, Bhattacherjee, & Ma, 2009; Youngberg, Olsen, & Hauser, 2009; Sternad et al., 2011), but few researchers have examined multiple external factors that influence intention to use an ERP solution or ERP solution usage in the stabilization stage. Although a small number of external factors have failed to illuminate user opinions about specific solutions (Agarwal & Prasad, 1999; Lu, Chun-Sheng, Liu, & Yao, 2003; Sun et al., 2009), most studies address only a small number of external factors.

The goal of this paper is to explore a large number of external factors that potentially influence attitudes and behavior related to ERP use in the operation phase of the ERP lifecycle and to investigate the importance of these factors for different ERP solutions (i.e., SAP solution and Microsoft Dynamics NAV solution). Because of the large sample size required to apply TAM to multiple individual variables, we combine external factors into three groups: personal characteristics and information literacy (PCIL); solution and technological characteristics (STC); and organizational-process characteristics (OPL). To test these factors, we collected survey data from 15 organizations where a SAP solution has been implemented and 29 organizations where Microsoft Dynamics NAV has been implemented. An ERP solution has been in operation for several years, and we employed partial least squares (PLS) to analyze the data. The rest of this paper is organized as follows: lifecycle of ERP solutions, literature review, ERP acceptance model, methodology, results and analysis, discussion, and conclusion.

**ERP SOLUTIONS LIFECYCLE**

Ross, Vitale, and Willcocks (2003) identified five stages ERP solutions lifecycle: (1) design, (2) implementation, (3) stabilization, (4) continuous improvement, and (5) transformation. In the ERP design stage, organizations make two important design decisions: one about process change and another about process standardization. In the implementation stage, organizations carefully plan implementation, deploying implementation teams to train users on the new solution and, to some extent, on new processes. Most found that “going live” tended to be highly disruptive as the new solution tended to be linked to new processes. However, it was not possible to implement the new solution and the new processes separately because
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