Examining Multilevel Perspective on Enterprise Resource Planning

System Success

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Abstract

ERP success is of paramount important to almost all ERP client-organizations as it is a preacquisite for improved and continuous benefit-realization. This research-in-progress aims to provide more comprehensive and joint view of ERP success by measuring the multilevel perspective and conducting multilevel analysis of ERP success. Relevant theoretical background is drawn upon in building our research concepts at different levels in our research model. The purposes of this study are to understand the nature of ERP success in a complicated organizational context and to understand what influences and constitutes an ERP success from the multilevel perspective. Multiple case studies approach will be adopted. The expected outputs from this research-in-progress are to provide a natural, complete and joint view of ERP success; and to offer rich opportunities for theoretical and empirical insights and suggest a new foundation for in-depth research on the nature of ERP success and its usage.

Keywords: IS Success, Enterprise Resource Planning, Multilevel Perspective, Case Study

1. Introduction and Purpose

Enterprise resource planning (ERP) is a large, modulated, integrated, and cross-functional packaged software system catering for majority of the fundamental functional areas (if not all departments) in an organization. It has become a must-have information systems and IT infrastructure in most companies and a criterion to stay competitive for some industries [17, 19]. ERP application revenue in 2006 is $28.8 billion and AMR research estimates this to reach $47.7 billion in 2011, with an 11% compound annual growth rate (CAGR) for ERP market through 2011 [7].

According to the earlier studies, there are many reasons for ERP implementation, such as for more powerful technology, best business practice, and strategic and competitive advantage [16]. Recent statistics show that globalization, centralization, regulation compliance and meeting new customer requirements are the drivers for ERP implementation [7]. In general, these benefits can be categorized into operational, managerial, organizational and strategic benefits [22]. Although most of the enterprises believed that ERP implementation is able to upgrade their market competitiveness and provide other advantages, the differences in organization culture, organization structure and flow path of enterprise operations created many variations in the final outcomes, quality or degree of success and increased the risk taken by the enterprises [25].

While success or failure of an ERP implementation from project management perspective is straight forward, the success of the

delivered system in the post-implementation phase is more difficult to determine as it may depend on the timing after which the system is implemented [14], and the point of view in an organization [10]. ERP success in the post-implementation phase is important in order to realize business benefit from the system. A successful ERP implementation project does not guarantee automatic and subsequent business benefits realization in the post-implementation (PI) phase.

However, in order to achieve continuous business benefits realization in the PI phase, the ERP system has to be a "success" system. It is a pre-acquisite for more and continuous benefit-realization regardless individual benefits (e.g. individual productivity or better decision-making quality) or organizational benefits (such as better revenue generation and business process efficiency). Many literatures have cited that top-management support and commitment, clear understanding of strategic goals, and organizational commitment to change are important and influence ERP implementation [13, 23, 24] and post-implementation [14] success. Likewise, system users' involvement, acceptance and use of the ERP system also play a critical role in determining the system success [3].

Most of the previous studies on ERP success, e.g. [21] focus on single unit of analysis. According to Rousseau [20], multilevel analysis helps researchers to avoid significant fallacies, affecting construct, internal and external validities, that can occur in single-level studies. In addition, multilevel analysis opens up new opportunities for theory-building to understanding linkages between levels [1]. According to Gefen and Ragowsky [6],

"benefits gained by ERP systems will be better predicted by being measured separately at the level of activity areas within the organization, rather than at the broad level of the entire ERP system" (p. 20).Thus, in order to provide joint view of ERP success, measuring the multilevel perspective is warranted, see [1]. In this study, we are interested in understanding the nature of ERP success in a complicated organizational context and understanding what influences and constitutes an ERP success from the multilevel perspective involving individual, group and firm levels.

2. Literature Review

Adopting the definition given by DeLone and McLean [3], we define ERP success as a system that can provide good system quality and information quality which leads to the upgrade of information system usage, and the subsequent satisfaction of the user, bringing its net benefits (i.e. improvement in individual, group and organization performance) to organization. Nevertheless, these alone could be difficult to happen without proper education and training to the system users in the first place, reasonable fit between the ERP functionalities and organizational business tasks, and sufficient support and commitment from the top management.

According to Markus and Tanis [10], success can mean different things depending on who defines it. For instance, system users define a system as success if they are satisfied with the system [26], whereas managers are likely to define a system as success if it produces performance gains [18]. Markus and Robey [11] note that no single measure is better than the other, thus, the choice of

the success variable usually is a function of the objective of the study, organizational context, IS aspect, research method and level of analysis, as in an individual, an organization, or a society.

2.1 Multilevel Theory

Multilevel theory is a meta-theory for theorizing about organization [1]. This theory fundamentally assumes that "organizations are multilevel systems… [each multilevel system understudied] is sliced into organization, group, and individual levels" ([8], p. 3). Multilevel theory applies the general systems theory to describe the nature of organizations as: composition – comprising different parts with different characteristics interacting together; top-down approach – parts are constrained and enabled by properties of the whole; bottom-up emergence – properties of the whole emerge from interactions among the parts; equilibrium and change – equilibrium exists but can change over time; and pace – part can change more rapidly than emergent properties of the whole [1].

As ERP is an organizational-wide management information system, and is utilized by different departments for various purposes to accomplish various tasks, we believe its impacts at different departments and at different organizational levels may not be the same [5, 17]. Therefore, we expect its impact to organization's success could be different and should be examined from multilevel perspective rather than single-level research. Based on multilevel theory, we define ERP multilevel perspective on success as involving individual (see [3]), group (see [4]) and firm (see [12, 15]) levels. The conceptual model for this three interlinked level of perspectives in this research-in-progress is as shown in Figure 1. The individual-level model is based on the IS success model [3], group-level model is founded on the fit-appropriation model [4], and the organization-level model is rooted in the institutional theory [15].
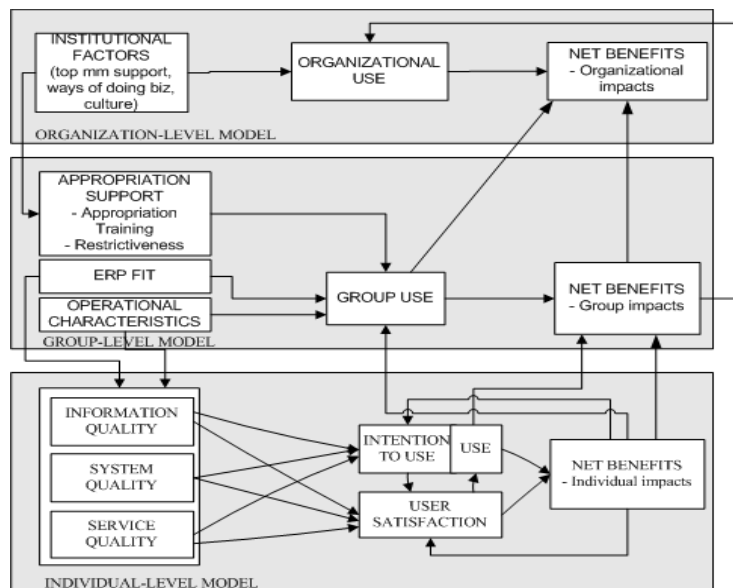

Fig. 1: Conceptual Model of Multilevel Perspective on ERP Success (adapted from [3, 4, 12, 15])

The research questions that we are intending to address in this research-in-progress (refer to Figure 1) are as follows. (1) How individual-level benefits of ERP system influence group-level use of the ERP system and group-level benefits? Similarly, how group-level benefits of ERP system influence organization-level use of the ERP system and organization-level benefits? (2) How organization-level institutional factors influence group-level appropriation support? (3) How group-level ERP fit and operational characteristics influence individual-level system, information and service quality? (4) How individual-level use of ERP system influence group-level benefits? Likewise, how group-level use of ERP system influence organization-level benefits?

(Due to the space limit, the full description of each level's model as in Figure 1 is not provided here. However, it is available based upon request. Sorry for the inconvenience.)

3. Research Method

Multiple case studies approach will be adopted. This research is an exploratory, descriptive, and collaborative case study. Case study method is chosen as: it can cover several forms of inquiry that help to understand and explain the meaning of social phenomenon with as little disruption of the natural setting as possible, see [27]. The data sources (i.e. the data collection methods) are survey, documentation, archival records (computerized records), and participant observations. This allows the author to do data triangulation and the contextual background of the case better.

Also, as there is very little guiding theory available, Yin [27] suggests that under these circumstances the case study is the most appropriate research method. Multiple case studies are suitable for multilevel (especially the inter firm) perspective investigation as they allow cross-case comparison analysis to be conducted at the firm level. The use of case study based method to conduct multilevel analysis is not a new approach as it has been applied in studying resilience in IT adoption [2], and resistance to IT implementation [9] in the healthcare field. The criteria set in choosing the right case study are: it has implemented and is using an ERP system internally for some time for example, for more than two years (see [14]); and all cases are in the same industry such as manufacturing, and the ERP system is from the same vendor.

3.1 Data Collection Method

This study is expected to involve at least three case-organizations. The multilevel constructs involve individual, group (i.e. differentiate by department, such as marketing, R&D and manufacturing departments in this example), and firm. Survey and interview are the main sources of data collection in this study. On the other hand, other data sources such as documentation, archival records (computerized records), and participant observations are meant to support and explain the results produced from the surveys and interviews. The references used in developing the survey items are shown in Table 1. The returned survey forms will be analyzed using the SPSS statistical package. Basic descriptive data and regression analysis will be conducted to identify the factors affecting ERP success and to understand the joint view of ERP success and usage.

3.2 Expected Outcomes and Presentations

The expected outcomes and potential contributions from this study are aiming to: (1) provide a natural, complete and joint view of ERP success and usage in practice; and (2) offer rich opportunities for theoretical and empirical insights and suggest a new foundation for in-depth research on the nature of ERP success and its usage. This research-in-progress is currently at the data collection stage. We expect to be able to provide more complete research results and insights from this study during the conference presentation.

4. Acknowledgement

5. References

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