An Exploratory Study of the Emergent Theory for Enterprise Resource Planning Upgrade Decision

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Abstract

This study finds that ERP upgrade decision is highly related to the type of incentives expected to be derived (or the type of business problems expected to be resolved by) from an ERP upgrade project. The incentives expected to be realized from an ERP upgrade appears to be a strong factor influencing ERP upgrade decision. Likewise, our empirical results here also suggest that the similarity between a firm and an ERP system business process has a strong impact on an ERP upgrade decision. However, symbols attached to an ERP system do not seem to be a strong differentiating- or salient-factor for an ERP upgrade decision. This is also the case for top management supports, which fail to prove to be a strong factor influencing ERP upgrade decision. However, we can argue that top management supports are necessary but not a sufficient factor to justify for an ERP upgrade.

Keywords

Enterprise resource planning, positivist case study, software upgrade, upgrade decision, theory-building.

INTRODUCTION

Enterprise Resource Planning (ERP) upgrade is one of the major activities in ERP maintenance 'iceberg' (Ng 2011). ERP upgrade, from the ERP-clients' perspectives, requires extensive attentions and efforts. But, on-going business improvement and benefit-realization are necessary for this kind of enterprise system (Seddon et al. 2010). This is in-line with the original reason organizations embarking on lengthy, expensive and stressful ERP projects, which is to receive substantial business benefits (Panorama 2014). However, according to the latest Panorama's 2014 ERP market survey, 66% of ERP client-organizations realize less than half of the anticipated business benefits (Panorama 2014).

ERP market is reaching maturity, therefore the vast majority of the installed base are typically in ERP upgrade cycles (Jimenez and Lee 2011). Even though a typical ERP upgrade cycle is between five to seven years (Acumatica 2010), to some organizations, in order to wait for the return on investment from previous investment, they will put off their ERP upgrade project (Paul 2008). This issue gets worsen considering the fact that conducting an ERP upgrade project is risky as it has a high possibility of duration overage, cost over-budget and operational disruptions.

In overall, prior researches in ERP upgrade can be broadly divided into practical-oriented and theory-oriented research outcomes. Practical-oriented studies, typically meant to prescribe what to do, focus on issues such as critical success factors (Nah and Delgado 2006; Olson and Zhao 2006) and best practices (Beaty and Williams 2006; Herschberg 2004; Paul 2009). On the other hand, theory-oriented output studies, which are more interested in explaining why an ERP upgrade phenomenon happened, can be further sub-divided into theory-building (Khoo and Robey 2007) and theory-testing (Ng 2006; Ng 2011). However, most of these theory-testing papers merely propose theoretical frameworks useful to understand this phenomenon but they have not provided sufficient empirical findings to support or refute the proposed research frameworks.

As a result, we know very little about ERP upgrade decision, and there is a paucity of empirical evidence and theory in the field of ERP upgrade decision (Dempsey et al. 2013; Law et al. 2010). An ERP upgrade decision is

defined as "a decision made which results in the installed old ERP version (partly or as a whole) being replaced by a newer version either from the same or different vendor's product" (Ng 2011). Thus, this study is meant to provide some empirical evidences: (1) to provide concrete data to support (or refute) the suitability of previously proposed theories for ERP upgrade decision, and (2) to provide more generalizability power and enhance prior ERP upgrade decision theory develop from case study researches. The research questions addressed here are: what is the nature of ERP upgrade decision, and how do firms justify their upgrade decisions in a competitive and dynamic business environment.

ERP UPGRADE THEORETICAL BACKGROUND

Similar to an ERP implementation project, an ERP upgrade decision has to be justified by its value, usefulness, and contribution to the business of client organizations (Ng 2011). Based on the critical review of trade press reports and academia research studies, Ng (2011) proposes an ERP upgrade decision conceptual model consisting of four basic concepts that have high impacts on the ERP upgrade decision. There are incentives or benefits for doing an upgrade (the extrinsic motivating factor), prior experiences and perceptions of an ERP system (the symbols attached to an ERP system), the fit (or similarity) between an ERP system and a firm's business processes, and the organizational issue of top management supports. This study is based on these four key ERP upgrade concepts.

Incentives – Research conducted by marketing research groups such as Aberdeen Group (Aberdeen Group 2010) and AMR Research (Swanton et al. 2004) show that one of the top factors to consider in an ERP upgrade decision is whether there is any apparent value and immediate returns from an ERP upgrade. This is the motivating forces that drive an ERP upgrade decision (Khoo and Robey 2007). In general, the incentives or benefits that can be obtained from an ERP system can be grouped into two perspectives, i.e., the technology and business needs (Ng 2006; Rahim et al. 2011). The incentives possibly derived from an ERP upgrade, from the technology perspective, can be conformity to government regulation (such as financial and environmental compliance), the information technologies adopted by the supply chain and best practices (such as internal control and risk management) (Kumar 2008), better IT platform such as service-oriented architecture and better integration with other systems (Bjorlin 2008), and fewer hardware and software costs (Jimenez and Lee 2011). From the business perspective, the incentives for upgrading an ERP system for strategic and managerial business benefits may include enhancing competitiveness (Dempsey et al. 2013), creating a foundation for other business initiatives such as business intelligence and customer relationship management (Beaumont 2004), better business processes and decision-making (Seddon et al. 2010), and new and enhanced functionality in the new release (Columbus 2013). For operational business benefits, this will include business transactions cycle time reduction and operational cost reduction (Ng and Chang 2009), and process optimization and improved access to information (Seddon et al. 2010).

The presence of incentives for doing an ERP upgrade is considered as an important element for convincing and persuading others to keep their ERP systems up to date. However, in the absence of incentives for doing an ERP upgrade, there will be difficult to justify the decision and convince others to take up on this effort.

Symbols attached – according some researchers, information systems are used and introduced primarily for their symbolic value (Feldman and March 1981). However, this initial symbolic value(s) may change after it has been used and interacted with other people who use the system or have prior upgrade experience. This is because not all users experience positive impacts from the system use or software upgrade (Khoo et al. 2011). Empirical findings by Ng and Tan (2004) suggest that symbolism attached to an ERP system is another important component to be considered in examining ERP upgrade decision. Some of the symbols found to be attached to an ERP system are extravagance costs of an ERP upgrade project, the sense of uncontrollability with the new changes of a new ERP upgrade software system and reliance on vendor for supports (Ng and Tan 2004). Some companies perceive ERP upgrade as expensive and risky to business (Swanton 2004), and painful experience (Wailgum 2010). Others find frequent upgrade can be costly and disruptive (Kimberling 2010).

Positive symbols associated with an ERP system increase one's willingness to upgrade the system for continued use as it is perceived as a worthwhile effort. On the other hand, negative symbols attached to an ERP system will make one feels doubtful and unwilling to accept the challenges to upgrade the system.

Similarity in business process – Some ERP client-organizations prefer to delay an ERP upgrade because of the new version does not conform to their ways of doing business (Swanton et al. 2004). According to Columbus (2013), misfits in business processes will result in customizing an upgrade system, which costs tenfold in services to every dollar spent on the software upgrade itself. This is similar to the initial ERP implementation project, whereby business process fit between an ERP system and the implementing-firm has impacts on the upgrade decision as it can increase risks and uncertainties involved an upgrade project (Ng 2013; Wang et al. 2006). As a result, some ERP client-organizations may delay an ERP upgrade and keep an outdated or

unsupported version of an ERP system until they can justify the risks and costs of an ERP upgrade with its values. And, their systems are not up to the vendor's standard of state-of-the-art software or business processes. Thus, the similarity between a firm and an ERP system business process is a practical factor that has an impact on an ERP upgrade decision. The more similarities in the two business processes the more buy-ins and lesser resistances will be for the upgrade decision.

Top management supports – Some organizations find that ERP upgrade project is a good opportunity to consolidate various ERP software instances to obtain better business process efficiency (Bjorlin 2008). In contrast, other companies perceive that as long as the existing business operation is functioning properly then they do not have the urgent need to do upgrade (Aberdeen Group 2010). In this case, there will be low management supports for the upgrade decision. In overall, different organizations have different top management perceptions for when is the right time for conducting an ERP upgrade project. Prior literature on ERP implementation has proven that top management supports are critical for the success of the implementation project (Wang et al. 2008). Likewise, getting the supports and commitments from the top management are crucial as upgrade causes changes in an organization and these require strong leaderships for change management (Jimenez and Lee 2011). Having top management supports for an ERP upgrade suggests that, from the management perspectives regardless operationally, tactically or strategically, there is a need and benefit for doing so. As a result, there will be fewer obstacles and more supports for making this decision.

Based on the above extant literature and prior studies, this study composes four fundamental research propositions to be tested in this research. They are as shown in Table 1. The key concepts considered are the incentives factor (Khoo and Robey 2007), symbols attached to an ERP system (Khoo et al. 2011; Ng and Tan 2004), similarity between a firm and an ERP system business process (Ng 2013; Wang et al. 2006), supports from top management (Wang et al. 2008), and ERP upgrade decision.

Table 1: Propositions Tested in This Study, Adapted from Ng (2011)

	Description
Proposition-1:	Incentives have strong positive impacts on making an ERP upgrade decision willingly.
Proposition-2:	Positive symbols attached to an ERP system have strong positive impacts on making an ERP upgrade decision willingly.
Proposition-3:	The similarity between a firm and an ERP system business process has strong positive impacts on making an ERP upgrade decision willingly.
Proposition-4:	Supports from top management have strong positive impacts on making an ERP upgrade decision willingly.

RESEARCH METHODOLOGY

Case study research method is taken as it allows multiple forms of inquiry that is useful to understand and provide detailed explanations of the phenomenon studied here. Positivist case study typology is adopted as we intend to provide detailed empirical evidence to validate existing untested propositions for ERP upgrade decision (Paré and Elam 1997). According to Yin (2003), this type of case study is suitable for illustrating support or challenging theoretical assumptions held prior to the data collection.

The criteria set for choosing the right case study are limited to company from the same industry and located in the same country. For literal replication, two ERP client-organizations are required and they have previously made their ERP upgrade decisions willingly. On the other hand, for theoretical replication, two ERP client-organizations are chosen such that they have done their ERP upgrade unwillingly or by force.

The targets of respondents in this study are the top executives such as CEO, CIO, and/or CFO who are familiar and involved in making ERP upgrade decision. Information is gathered with the intent of analyzing and interpreting about the phenomenon. Data collection methods applied here are (1) structured and semi-structured interviews; (2) documentations such as reports, procedure and manuals; and (3) participant observations. Participant as observer role in this study, besides initially functioning as a key informant, serves to ensure construct validity in this study by providing chain of evidence and reviewing the interview transcripts. Prior to each interview, the interview questions are sent to the interviewees a week earlier in order to allow them to prepare or write down their responses for each question related to their prior and/or recent ERP upgrade decision. Whenever necessary, the researchers transcribe the interviews immediately after each interview. Then, the transcribed text is sent back to the interviewees to review the interview data to ensure the interpreted data is authentic and the same as its original intent and meaning, to ensure construct validity. Coding is then conducted in analyzing the interview transcripts by focusing on the core themes in the propositions as given in Table 1.

In order to test the propositions in this study, (1) case comparison analysis (Flick 2006; Yin 2003) is conducted to confirm and identify how the incentives factor, symbols attached to an ERP system, similarity between a firm and an ERP system business process and supports from top management differ between ERP client-organizations that are willingly and unwillingly decided to implement their ERP upgrade projects; (2) pattern-matching (Eisenhardt 1989; Yin 2003) is adopted to determine if the predicted key cause-effect patterns between independent and dependent variables defined before and after data collection are being matched; and (3) tabular displays and graphs (Leonard-Barton and Deschamps 1988) are used to visualize the key cause-effect patterns and core themes represented by each case.

FINDINGS AND DISCUSSIONS

Four case studies were conducted and the characteristics of each case study were illustrated in Table 2 below. These case companies are located in Taiwan and belong to the manufacturing industry. As shown, two of the cases (labelled as Company W and Company R, for anonymous purpose) had willingly upgraded their ERP systems, whereas the other two cases (named Company S and Company T) were forced to upgrade their ERP systems. The latter two cases were forced to upgrade meant that they would delay or would not have upgraded their systems if they had the choices. They upgraded their ERP systems unwilling because of vendor supports termination for their software version, conformity to the international financial reporting standard (IFRS), lack of the understandings of the needs for an upgrade and lack of budget for it. The data collection was started in late 2011 and completed in 2012. A total of 24 interview transcripts were produced from the four case studies.

Table 2: Case Studies Characteristics

	Company W	Company S	Company T	Company R
Industry	Manufacturing industry (a leading global supplier of liquid crystal display)	Manufacturing industry (capacitors, transformers, consumer electronic products)	Manufacturing industry (optical storage media and CD packaging box, public listed company)	Manufacturing industry (top five Micro UPS manufacturers in the world, public listed company)
Num. of emp.	14,000	180	3,000	7,000
Enterprise size	Large (>200 employees)	SME (<200 employees)	Large (>200 employees)	Large (>200 employees)
Annual Revenue	NTD$2.18 billion	NTD$600 million	NTD$28.4 billion	NTD$20 billion
Initial ERP system	2005 – WorkflowERP	2002 – WorkflowERP (Local ERP)	2000 – SAP 4.6C	1996 – MFG/PRO ERP system, QAD
Cur. ERP System	SAP ECC 6.0	Workflow ERP GP (Local ERP)	SAP ECC 6.0	SAP ECC 6.0
Freq. of upgrade	Twice	Once – delay and forced upgrade	Once – delay and forced upgrade	Once
# of interviewees	Six	Five	Seven	Six

Proposition-1: Incentives have strong positive impacts on making an ERP upgrade decision willingly

Based on the results of the coding done in the interview transcripts, case-by-case, specific to the concept of "ERP upgrade incentive," we find that incentive can be broadly divided into three common theme categories, i.e. strategic, managerial and operational incentives. Examples of the descriptive code for each incentive category are shown in Table 3. After complete identifying the common themes in each case, cross-case analysis is conducted. This involves conducting the pattern-matching, and producing tabular displays and graphs of the key cause-effect patterns.

The data analysis in Table 3 shows that Company W that upgrade its ERP system willingly emphasizes more on the strategic incentives and managerial incentives in making its upgrade decision. This result is also consistent with the case of Company R. Conversely, Company S and Company T that upgrade their ERP systems unwillingly focus more on the managerial incentives and operational incentives rather than the strategic incentives (see Figure 1). This shows that constant cause-effect patterns present between the independent and dependent variables. Thus, proposition-1 is supported in this study.

Table 3: Case Comparisons for Proposition-1

	INCENTIVES OR BUSINESS BENEFITS		
	S=STRATEGIC (attract investor, future business expansion/growth, business profit, IT business strategies)	M=MANAGERIAL (better budgeting, planning, controlling, decision-making, compliance, maintenance supports)	O=OPERATIONAL (bug-free, operational efficiency, data integration, unsatisfied users, working efficiency)
Company W	4/10 (40%)	2/10 (20%)	4/10 (40%)
Company S (forced)	0/4 (0%)	1/4 (25%)	3/4 (75%)
Company T (forced)	1/10 (10%)	7/10 (70%)	2/10 (20%)
Company R	6/15 (40%)	7/15 (47%)	2/15 (13%)

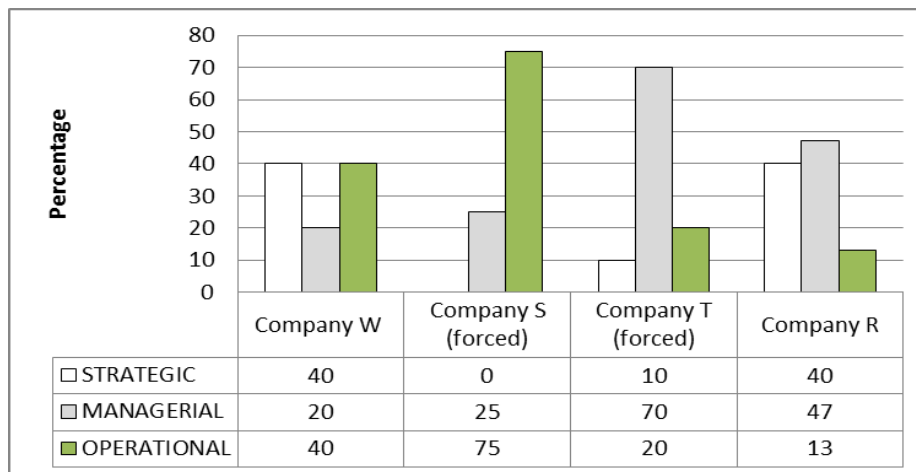|	STRATEGIC	MANAGERIAL	OPERATIONAL
Company W	40	20	40
Company S (forced)	0	25	75
Company T (forced)	10	70	20
Company R	40	47	13

Figure 1: Respondents Expressing Their Perceived Type of Incentives Derivable from an ERP System

Proposition-2: Positive symbols attached to an ERP system have strong positive impacts on making an ERP upgrade decision willingly

Interview transcripts coding for the concept of "symbols attached to an ERP system" are conducted for each case-company. For each case, the descriptive codes can be grouped into positive and negative symbols (Table 4). Some examples of the descriptive codes for the positive symbols are: friendly-user interface, increase the work efficiency, well-designed system, centralized database, unified information platform, agile, and support multiple languages. On the other hand, the examples of the negative symbols attached to an ERP system are: customizations are required, more complicated, massive, lack of familiarity, and maintenance contract. Quantitative content analysis is conducted and the total number of positive symbol count and negative symbol count in each case-company is tabulated in Table 4, for cross-case comparison. As shown, both Company W and Company R have a higher percentage of positive symbols attached to an ERP system than the negative symbols. However, Company S and Company T, where their ERP upgrade decisions are forced, also have the same effects, i.e. having more positive symbols attached to their ERP systems than the negative ones.

A closer look at the case-by-case comparison, it is observed that although Company R has the highest negative symbols attached to their ERP system (compared to the other three cases), the company still makes the decision to upgrade their ERP system. In contrast, although Company S has the highest positive symbols attached to their ERP system, the company's ERP system upgrade decision is forced, after delaying for 9-year. As a result, there are mixed results for the observed relationship between an upgrade decision and positive/negative symbols attached to the ERP system (Table 4). Thus, proposition-2 is not supported in this study.

Table 4: Case Comparisons for Proposition-2

	SYMBOLS ATTACHED	
	P= POSITIVE	N= NEGATIVE
Company W	16/19 (84%)	3/19 (16%)
Company S (forced)	24/25 (96%)	1/25 (4%)
Company T (forced)	42/54 (78%)	12/54 (22%)
Company R	26/43 (60%)	17/43 (40%)

Proposition-3: The similarity between a firm and an ERP system business process has strong positive impacts on making an ERP upgrade decision willingly

The results of the coding performed on the interview transcripts, for the four case studies, for the core theme associated with the "similarity between a firm and an ERP system business process" produce 34 descriptive codes. Examples of these codes are: not the same, ERP system is able to satisfy the need of our company, there are some differences, it is the same, completely the same, not exactly the same, almost the same, and has a few differences. These 34 codes are then reduced to three common theme categories as shown in Table 5.

Following this, quantitative content analysis is conducted and the total number of codes belonging to each category is tallied and computed. The subsequent data analysis on Company W suggests that it has 91% of its descriptive codes belonging to "the same" and "almost the same" categories for "similarity between a firm and an ERP system business process." Company R, which implements its ERP upgrade willingly, also has the same result such that 80% of its descriptive codes for this theme falls into "the same" category. In comparison with the other two case companies, Company S and Company T, that prefer to delay their ERP upgrade (if they have the choice) have the highest percentage of descriptive codes for "not the same" for the "similarity between a firm and an ERP system business process." This indicates that there is a consistent pattern between the independent and dependent variables. Thus, there is a strong positive impact between the decision to upgrade an ERP system willingly and the similarity between a firm and an ERP system business process (see Figure 2). Based on this, the proposition-3 is supported by our empirical data here.

Table 5: Case Comparisons for Proposition-3

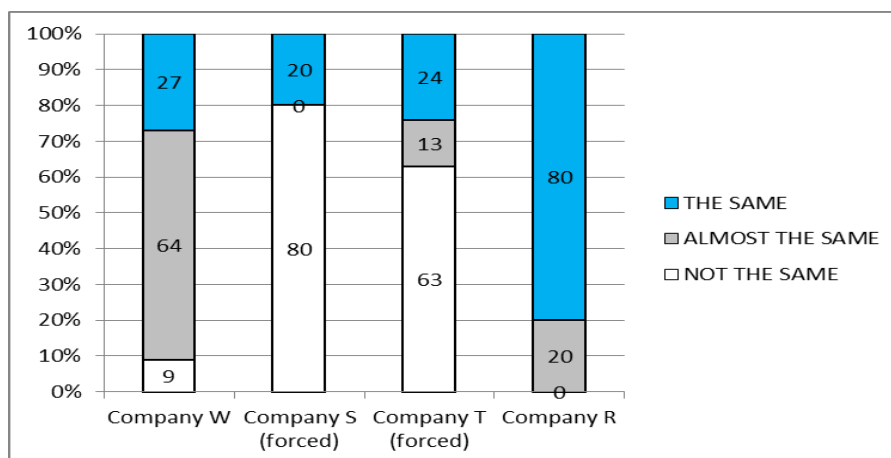|	Similarity between a firm and an ERP system business process		
	1= NOT THE SAME	2= ALMOST THE SAME	3= THE SAME
Company W	1/11 (9%)	7/11 (64%)	3/11 (27%)
Company S (forced)	4/5 (80%)	0/5 (0%)	1/5 (20%)
Company T (forced)	5/8 (63%)	1/8 (13%)	2/8 (24%)
Company R	0/10 (0%)	2/10 (20%)	8/10 (80%)

Figure 2: Respondents Expressing Their Perceived Degree of Similarity between Their Company and an ERP System Business Process

Proposition-4: Supports from top management have strong positive impacts on making an ERP upgrade decision willingly

The core concept focused in this proposition is "top management supports." In this case, we concentrate the analysis of the interview transcripts, in each case study, on the interview questions that are particularly related to this concept. The descriptive quotes related to this core theme are found to be: interested in, surely interested, definitely provide the required supports, strongly supported, not interested, was not keen in supporting the upgrade, and did not really want to support the ERP system upgrade. These are categorized into two common themes, "not supporting" and "fully supporting."

In making the cross-case comparisons, it is found that the two cases, i.e. Company W and Company R in this study, that upgrade their ERP systems willingly do obtain full supports from their top management. Surprisingly, the other two case companies, where their upgrade decisions are not made willingly also have more than 50% of their descriptive codes indicating the top management supports for their ERP upgrade decisions. Therefore, there

is no stable pattern of cause-effect relationship between the ERP decision and top management supports. Thus, the empirical data in this study does not fully support our proposition-4.

Table 6: Case Comparisons for Proposition-4

	Top Management	
	1= NOT SUPPORTING	2= FULLY SUPPORTING
Company W	0/6 (0%)	6/6 (100%)
Company S (forced)	0/6 (0%)	6/6 (100%)
Company T (forced)	3/8 (40%)	5/8 (60%)
Company R	0/10 (0%)	10/10 (100%)

IMPLICATION AND CONCLUSION

This study finds that ERP upgrade decision is highly related to the type of business benefits expected to be derived (or the type of business problems expected to be resolved by) from an ERP upgrade project. In general, it is observed that strategic business benefit has a relatively highest impact on the upgrade decision than the managerial and operational business benefits. The incentives or business benefits expected to be realized from an ERP upgrade does appear to be a strong factor influencing ERP upgrade decision (proposition-1). This finding is in line with prior studies conducted by Khoo and Robey (2007), and Dempsey et al. (2013). Likewise, our empirical results here also suggest that the similarity between a firm and an ERP system business processes has a strong impact on an ERP upgrade decision (proposition-2). This is consistent with the prior studies related to ERP system implementation success (Wang et al. 2008) and post-implementation system use success (Ng 2013). However, symbols attached to an ERP system do not seem to be a strong differentiating- or salient-factor for the ERP upgrade decision (proposition-3). This finding is not consistent with Ng and Tan (2004). This is also the case for top management supports, which fail to prove to be a strong factor influencing ERP upgrade decision (proposition-4). However, we can argue that top management supports are necessary but not a sufficient factor to justify for an ERP upgrade.

This study attempts to follow the rigor of positivist case study suggested by Dubé and Paré (2003) as far as possible in order to ensure validity and reliability of this study. It is noted that the quality of this study can be further improved by adding sufficient quotes collected during the interviews with the respondents. However, due to the page limits for this conference paper, this is not provided here. The potential research implications from the contributions of this study are that they can function as a basis where one can build a stronger theory for ERP upgrade decision. This can be done by further improving the research propositions tested here, testing the propositions using survey research method, and examining if the existing theory can be used or extended to explain the ERP upgrade decision.

REFERENCES

Aberdeen Group. 2010. "SaaS ERP: Trends & Observations 2010." Retrieved Mar 6, 2011, from http://www.aberdeen.com/aberdeen-library/6890/RA-enterprise-resource-planning.aspx

Acumatica. 2010. "The Importance of ERP Deployment Options." Retrieved 13 Dec, 2010, from http://erpcloudnews.com/2010/08/the-importance-of-erp-deployment-options/

Beaty, R.C., and Williams, C.D. 2006. "ERP Ii: Best Practices for Succesfully Implementing an ERP Upgrade," *Communications of the ACM* (49:3), March 2006, pp. 105-109.

Beaumont, J. 2004. "Upgrading Your ERP System: Cognizant's Top 10 List," Cognizant Technology Solutions, Teaneck, NJ, p. 9,

Bjorlin, C. 2008. "Customers Upgrade to SAP ERP 6.0 for Support, Software Consolidation." Retrieved 01 Sep, 2010, from http://searchmanufacturingerp.techtarget.com/news/1326125/Customers-upgrade-to-SAP-ERP-60-for-support-software-consolidation

Columbus, L. 2013. "Deciding If Upgrading Your Enterprise Software Is Worth It or Not." from http://www.forbes.com/sites/louiscolumbus/2013/11/25/deciding-if-upgrading-your-enterprise-software-is-worth-it-or-not/

Dempsey, S., Vance, R., and Sheehan, L. 2013. "Justification of an Upgrade of an Enterprise Resource Planning (ERP) System – the Accountant's Role," *Global Journal of Human Social Science Research* (13:1), pp. 1-9.

Dubé, L., and Paré, G. 2003. "Rigor in Information Systems Positivist Case Research: Current Practices, Trends, and Recommendations," *MIS Quarterly* (27:4), December, pp. 597-635.

Eisenhardt, K.M. 1989. "Building Theories from Case Study Research," *Academy of Management Review* (14:4), pp. 532-550.

Feldman, M.B., and March, J.G. 1981. "Information in Organizations as Signal and Symbol," *Administrative Science Quarterly* (26:2), Jun, pp. 171-186.

Flick, U. 2006. *An Introduction to Qualitative Research*, (Third ed.). London: Sage Publications.

Herschberg, R. 2004. "Best Practices for Developing Your R/3 Upgrade Roadmap," in: *Managing SAP Projects 2004*. Las Vegas: Wellesley Information Services.

Jimenez, D.-Z., and Lee, W. 2011. "Buyer Conversations: Coca-Cola Bottling Co. Consolidated's ERP Upgrade Journey - Apej View," in: *Asia/Pacific Business Applications and Information Management: Buyer Case Study*. Singapore: IDC.

Khoo, H.M., and Robey, D. 2007. "Deciding to Upgrade Packaged Software: A Comparative Case Study of Motives, Contingencies and Dependencies," *European Journal of Information Systems* (16), 1 October, pp. 555-567.

Khoo, H.M., Robey, D., and Rao, S.V. 2011. "An Exploratory Study of the Impacts of Upgrading Packaged Software: A Stakeholder Perspective," *Journal of Information Technology* (26), pp. 153-169.

Kimberling, E. 2010. "Tips for Avoiding Common Pitfalls of ERP Upgrades."   Retrieved Dec 09, 2010, from http://searchmanufacturingerp.techtarget.com/news/2240020512/Tips-for-avoiding-common-pitfalls-of-ERP-upgrades

Kumar, S. 2008. "Grc Is a Key Business Driver for SAP Upgrade."   Retrieved 20 Dec, 2010, from http://www.free-press-release.com/news/200806/1212568140.html

Law, C., Chen, C., and Wu, B. 2010. "Managing the Full ERP Life-Cycle: Considerations of Maintenance and Support Requirements and It Governance Practice as Integral Elements of the Formula for Successful ERP Adoption," *Computers in Industry* (61:3), April 2010, pp. 297–308.

Leonard-Barton, D., and Deschamps, I. 1988. "Managerial Influence in the Implementation of New Technology," *Management Science* (34:10), pp. 1252-1265.

Nah, F.F., and Delgado, S. 2006. "Critical Success Factors for Enterprise Resource Planning Implementation and Upgrade," *Journal of Computer Information Systems* (46:5), pp. 99-114.

Ng, C.S.-P. 2006. "A Resource-Based Perspective on Enterprise Resource Planning (ERP) Capabilities and Upgrade Decision," *Pacific Asia Conference on Information Systems (PACIS)*, Kuala Lumpur, Malaysia, pp. CD-ROM.

Ng, C.S.-P. 2011. "Enterprise Resource Planning (ERP) Upgrade Decision: Toward a Unified View," *The 15th Pacific Asia Conference on Information systems (PACIS)*, Brisbane, Australia: Queensland University of Technology, pp. 1-10 (Online Publication, URL: http://aisel.aisnet.org/pacis2011/).

Ng, C.S.-P. 2013. "A Case Study on the Impact of Customization, Fitness, and Operational Characteristics on Enterprise-Wide System Success, User Satisfaction and System Use," *Journal of Global Information Management* (21:1), January-March, pp. 19-41.

Ng, C.S.-P., and Chang, P.C. 2009. "Exploring the Links between Competitive Advantage and Enterprise Resource Planning (ERP) Upgrade Decision: A Case Study Approach," *16th ISPE International Conference on Concurrent Engineering*, Taipei: Springer, pp. 179-191.

Ng, M.M.T., and Tan, M.T.K. 2004. "Symbolic Processes on ERP Versus "Legacy" System Support," School of Computing, National University of Singapore, Singapore, pp. 1-12,

Olson, D.L., and Zhao, F. 2006. "Critical Success Factors in ERP Upgrade Projects," in *Research and Practical Issues of Enterprise Information Systems,* A. Tjoa, M., L. Xu and S. Chaudhry (eds.). Boston: Springer, pp. 569-578.

Panorama. 2014. "2014 ERP Report," Boston, p. 18, from http://go.panorama-consulting.com/rs/panoramaconsulting/images/2014-ERP-Report.pdf.

Paré, G., and Elam, J.J. 1997. "Using Case Study Research to Build Theories of It Implementation," in *Information Systems and Qualitative Research,* A.S. Lee, J. Liebenau and J.I. DeGross (eds.). London: Chapman & Hall, pp. 542-568.

Paul, L.G. 2008. "How to Avoid Mistakes During ERP Upgrades."   Retrieved 13 Dec, 2010, from http://searchmanufacturingerp.techtarget.com/news/1325046/How-to-avoid-mistakes-during-ERP-upgrades

Paul, L.G. 2009. "ERP Upgrade Planning Best Practices Demystified."   Retrieved 09 Dec, 2010, from http://searchmanufacturingerp.techtarget.com/news/1345398/ERP-upgrade-planning-best-practices-demystified

Rahim, M.M., Shanks, G., and Johnston, R.B. 2011. "A Cross Industry Comparison of Inter-Organisational Systems Implementation Activities," *Journal Electronic Commerce Research* (11:2), pp. 215-243.

Seddon, P.B., Calvert, C., and Yang, S. 2010. "A Multi-Project Model of Key Factors Affecting Organizational Benefits from Enterprise Systems," *MIS Quarterly* (34:2), pp. 305-328.

Swanton, B. 2004. "Build ERP Upgrade Costs into the Business Change Programme - Not the It Budget." Retrieved December 3, 2004, from http://www.computerweekly.com/

Swanton, B., Samaraweera, D., and Klein, E. 2004. "Minimizing ERP Upgrade Costs Requires Synchronizing with Business Improvement Projects," AMR Research, Boston, p. 14,

Wailgum, T. 2010. "Why ERP Upgrade Fears Affect on-Premise Versus SaaS Decisions."   Retrieved Mar 6, 2011,   from

http://www.cio.com/article/637874/Why_ERP_Upgrade_Fears_Affect_On_Premise_versus_SaaS_Decisions

Wang, E.T.G., Klein, G., and Jiang, J.J. 2006. "ERP Misfit: Country of Origin and Organizational Factors," *Journal of Management Information Systems;* (23:1), pp. 263-292.

Wang, E.T.G., Shih, S.-P., Jiang, J.J., and Klein, G. 2008. "The Consistency among Facilitating Factors and ERP Implementation Success: A Holistic View of Fit," *Journal of Systems and Software* (81:9), pp. 1609–1621.

Yin, R.K. 2003. *Case Study Research: Design and Methods*, (3rd ed.). Thousand Oaks, California: Sage Publications.

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