July 2009

KNOWLEDGE MANAGEMENT FOR ENTERPRISE SYSTEMS: OBSERVATIONS FROM SMALL, MEDIUM AND LARGE ORGANIZATIONS

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ABSTRACT

Anecdotal evidence suggests that the lifecycle-wide management of Enterprise System (ES) related knowledge is critical for ES health and longevity. At a time where many ES-vendors now offering solutions to Small and Medium size organizations, this paper investigates the ability of Small and Medium size organizations to maintain a lifecycle-wide knowledge management strategy. The paper explores the alleged differences in the knowledge management practices across 27 small, medium and large organizations that had implemented a market-leading ES. Results suggest that: (1) despite similar knowledge creation efforts in all three organizational sizes, small organizations struggle with retaining, transferring and applying the knowledge. The study also reveals that, (2) the overall goodness of the knowledge management process in larger organizations remains higher than their small and medium counterparts.

Keywords: Organization Size, Knowledge Management, Enterprise System

1. INTRODUCTION

Enterprise Systems (ES) have emerged as possibly the most important and challenging development in the corporate use of information technology. Organizations have invested heavily in these large, integrated application software suites expecting improvements in - business processes, management of expenditure, customer service, and more generally, competitiveness (Laukkanen, Sarpola et al. 2007). Forrester survey data (Wang and Hamerman 2008) consistently shows that investment in ES and enterprise applications in general remains the top IT spending priority. The ES market, currently estimated at $38 billion, continues to grow at a steady rate of 6.9% and is predicted to reach $50 billion by 2012 (Wang and Hamerman 2008). Substantial resource requirements in ES implementation and lifecycle wide management have traditionally restricted these applications to large corporations, prompting some researchers and practitioners to claim that ES are best suited for large corporations (Hillegersberg and Kumar 2000). Recent changes in ES marketplace, wherein the demand for Enterprise Systems from large organizations has plateau, have prompted ES vendors to focus on Small and Medium organizations (commonly referred to as SMEs) with some-what scaled-down ES (Piturro 1999; Everdingen, Hillegersberg et al. 2000).

In this domain, there are many examples of SMEs implementing traditional ES, in consortia with other larger counterparts. Such examples of conglomerated ES-implementations are common in multi-national organizations and public sector organizations, where the small and medium organizations/departments implement ES as a part of a larger initiative. Our interest herein is not on the SMEs that have implemented a scaled-down ES that is designed specifically for the SMEs, instead the SMEs implementing a traditional

ES. Despite the organizational wide ES-implementations, it is widely rumored that large and SMEs face different types of issues and purportedly receive different benefits and impacts from ES compared to their smaller counterparts. In relation to ownership of Enterprise Systems, large companies in particular face a variety of challenges that drive up their ownership costs. It is pointed out that the SMEs are struggling with finding a solution that balances ease-of-use with the industry-specific requirements needed to effectively run the business (Wang and Hamerman 2008). Such discussions in the market place have renewed the debate over the suitability of conventionally large packaged Enterprise Systems for SMEs. It is argued that, since the costs and risks of these large technology investments can more than rival their potential payoffs, highly cost sensitive SMEs would heavily scrutinize their ES investments. There has been an on-going historical discussion of the implications of organizational size for Information Systems performance (Raymond 1985; DeLone 1988; Raymond 1992; Lai 1994).

Despite the contributions of prior research in understanding the impacts of IS in different organizational sizes, there is a dearth of studies investigating the impact of organizational size in relation to the *antecedents of Information Systems success*. This paper attempts to minimize this gap by focusing on an important antecedent: *lifecycle-wide knowledge management* in small, medium and large organizations. In parallel with the growing prominence of ES, over the past two decades, there has been increasing interest in the conception of knowledge as an important organizational asset. The management of ES-related knowledge has been identified as a critical factor of enterprise systems lifecycle wide success (Davenport 1996; Davenport 1998; Davenport 1998; Gable, Scott et al. 1998; Bingi, Sharma et al. 1999; Sumner 1999; Klaus and Gable 2000). The emphasis of knowledge management relates to the entire lifecycle (not limited as a critical success factor during implementation). Therefore, the selection knowledge Management as an antecedent of ES-success is highly appropriate to understand the impact of organizational size.

With this primary objective of demonstrating the lifecycle-wide knowledge management requirements, this study gathers data from 310 respondents representing a group of 27 small, medium and large organizations that had implemented a market leading Enterprise System. This was an appropriate system and context, being relatively simple and homogenous: all organizations were implementing the same ES; all organizations implemented around the same time and had been operational for approximately five years at the start of the data collection and, thus, were at a similar point in the ES lifecycle.

The paper begins with a literature review which includes two topic areas: (1) organizational size and (2) knowledge management. The review of literature on organizational size provides a broad contextual overview of characteristics of the small, medium, and large organizations, while demonstrating the possible impact of organizational size on ES impacts. The summary of knowledge management literature is aimed at deriving the knowledge management process. The phases of the knowledge management process are then utilized in the survey instrument herein for data collection purposes. The research methodology and the data collection instrument are introduced next, followed by discussions of the research context. The subsequent data analysis explores the abilities of the small, medium and large organizations in relation to lifecycle-wide knowledge management. The paper concludes with a summary of research findings citing practical and research contributions.

2. LITERATURE REVIEW ON INFORMATION SYSTEMS AND ORGANIZATIONAL SIZE

The number of employees has been employed as a common tool of classify organizations. However, the classification guidelines and benchmarks employed to categorize organizations into “small”, “medium”

and “large” groupings remain highly context specific. The number of employees for a small organization ranges from 90 in Belgium, 100 in the USA and extends to 250 employees in Germany. According to the European Union guidelines, organizations with less than 50 employees are classified as small, and mid-sized is often referred to as organizations with less than 500 employees (European Union 2003). In the context of ES, the classifications of ‘large’, ‘medium’ and ‘small’ is similarly unclear. However, given that some ES vendors now providing SME solutions to organizations below 200, provides an implicit guideline for the context.

Prior research on organizational size has discussed the distinctive and unique needs of organizations based on its size (Raymond 1985; DeLone 1988; Lai 1994). Schultz and Slevin (1975) and Ein-Dor and Segev (1978) were among the very first researchers to point out the importance of organizational factors in managing an Information System. In their early work, Ein-Dor and Segev (1978) proposed a framework after studying Management Information System (MIS) in which they identified organization size as a critical variable. They found that the organization size had special importance because of its influence on resource availability, requirements necessary for integration of professional units within an organization, degree of formalization of organizational systems, and lead time for planning and implementation. Furthermore, Ein-Dor and Segev (1978) recognized organization size as an uncontrollable variable and stating that [CB] IS projects are less likely to succeed in smaller organizations compared to larger counterparts. Similarly, Whisler (1970) studied nineteen insurance companies and reputed that firm size was directly related to performance of IS. Bilili and Raymond (1993) described SME decision making process as reactive, informal, and intuitive. Moreover, researchers (Doukidis, Lybereas et al. 1996; Proudlock, Phelps et al. 1999) have asserted that small to mid-sized organizations tend to have an opportunistic, day-to-day focus in relation to Information Systems management and benefits and seldom plan for long-term benefits. Cheney (1983) investigated various factors affecting small businesses in using information systems and found that small business are prone to: (1) software, (2) hardware and (3) implementation problems in Information Systems. Similarly, DeLone (1981) studied the relationship between the size of manufacturing firms and IS usage. He concluded that firm size is: (1) directly related to the age of the firm’s computer operations, (2) inversely related to the amount of external programming that are being used, (3) directly related to the portion of revenues allocated to Electronic Data Processing (EDP), and (4) inversely related to the percentage of EDP costs that are used for purchasing computer hardware. Addressing technical needs for organizations, Farhoomand and Hrycyk (1985) reported that small to mid-sized companies lack adequate technical staff for IS endeavors.

Considering application types, Melone (1985) found small to mid-sized organizations place a greater emphasis on accounting and inventory control, but identified that inventory controlling software is highly problematic in such organizations. Nickel and Seado (1986) concur aforementioned findings using 121 small businesses stating that budgeting and inventory control were the primary uses of IS in small organizations. A study by Cooley et al. (1987) of mid-sized organizations identified user-friendly interfaces as a key factor for end users’ satisfaction, while lower implementation costs were the most important for management of SMEs. Montazemi (1988), investigating the aforementioned preposition, confirmed the impact of organization size on end user satisfaction, claiming that users of large organizations are more satisfied with IS than the small organizations. Harrison (1997), used the Theory of Planned Behaviour to explain technology adoption and suggested a positively relationship between business size and the importance of expectations from the [social] environment.

Investigating on IS acquisition in medium and large organizations, Turner (1992) hypothesized a positive relationship between firm size and software sophistication, suggesting that SMEs require assistance from external sources in IS adoption and management. Turner (1992) also recommended SMEs develop applications in-house, rather than opting for packaged applications. Similarly, Raymond (1985) found that SMEs are better placed for developing, implementing and administering their own applications in-house, compared to their larger counterparts, specifying that medium-sized organizations could maintain an IS

with minimal financial, technical and personnel requirements. It is also noted that, resource constraints has made SMEs to follow an incremental approach to IT investments, which, in turn, may result in isolated and incompatible systems, as well as limited flexibility (Levy and Powell 1998). .

Some researchers have investigated the relationship between consultant engagement in information systems and organizational size (Bilili and Raymond 1993; Levy and Powell 1998; Mitev and Marsh 1998). Laukkanen et al. (2007) suggest that the resource constraints faced by SMEs may hinder their ability to maintain technology up to date, while at the same time forcing them to consider their IT investments long term (Levy and Powell 1998). Soh et al. (1992) and Gable et al. (1998) allude to the importance of seeking expert assistance from consultants in computerization success in small businesses. They witnessed better system usage in small businesses where consultants were employed.

3. LITERATURE REVIEW ON KNOWLEDGE MANAGEMENT

The objective of this section of the literature review is to derive the attributes of the knowledge management process applicable for the Enterprise System Lifecycle. Knowledge management (KM) is often conceived as a systematic process consisting of multiple phases. The KM lifecycle phases will then be used for the survey instrument to assess the purported differences between different organizational sizes. (Pentland 1995) defines the knowledge management process as an on-going set of activities embedded in the social and physical structure of the organization with knowledge as their final product. Table 1 synthesizes observations from the literature on knowledge management processes. It is recognized that the level of detail offered by each author varies much. Though table 1 depicts diverse, at times possibly conflicting perspectives on knowledge management activities, some apparent consensus on the initial phase of knowledge management is observed. And though the granularity of the frameworks varies and the number of phases ranges from three (e.g. Walsh and Ungson 1991) to seven (Allee 1997), four common phases spanning the knowledge management lifecycle can be loosely superimposed: (1) acquisition / creation / generation, (2) retention / storage / capture, (3) share / transfer / disseminate and (4) application / utilization / use; or more succinctly, Creation→Retention→Transfer→Application.

Reference	Knowledge Management Phases						
Alavi and Leidner (2001)	Creation	Storage	Transfer	Application			
Allee (1997)	Collect	Identify	Create	Share	Apply	Organize	Adapt
Argote (1999)	Share	Generate	Evaluate	Combine			
Bartezzaghi et al. (1997)	Abstraction and Generalization	Embodiment	Dissémination	Application			
Davenport and Prusak (1998)	Determine Requirements	Capture	Distribute	Use			
Despres and Chauvel (1999)	Mapping	Acquire Capture	Package	Store	Apply Share	Reuse Innovate	
Dixon (1992)	Acquire	Distribute	Interpret	Making Meaning	Org: memory	Retrieve	
Horwitch and Armacost (2002)	Create	Capture	Transfer	Access			
Huber (1991)	Acquisition	Distribution	Interpretation	Org: Memory			
Nevis et al. (1995)	Acquisition	Sharing	Utilization				
Stein and Zwass (1995)	Acquisition	Retention	Maintenance	Retrieval			
Szulanski (1996)	Initiation	Implementation	Ramp-up	Integration			

Walsh and Ungson (1991)	Acquisition	Storage	Retrieval	
Wiig (1997)	Creation	Capture	Transfer	Use

Table 1: Knowledge Management Lifecycle Phases (based on Sverlinger (2000))

Thus, akin to Alavi and Leidner (2001), this study conceptualizes the knowledge management process as four phases: (1) Knowledge creation, (2) Knowledge retention, (3) Knowledge transfer, and (4) Knowledge application; where the four phases represent the full lifecycle of knowledge management activities. The following section describes these four phases of the knowledge management process.

The creation phase (*knowledge creation*) involves developing new content and replacing existing content within the organization's tacit and explicit knowledgebase (Alavi and Leidner 2001) and corresponds primarily with the planning and implementation stages of the ES lifecycle. While it is recognized that knowledge creation continues to occur beyond ES implementation, during implementation (or major upgrades) there is a sudden peak in new knowledge requirements and related knowledge creation. This peak involves all three key players – consultant, vendor and client (Gable, Heever et al. 1997), where the external players bring new knowledge on the software and on "best-practice" business processes to share with the client organization (Davenport 1998), and the client organization shares organizational business process knowledge with the external parties. In early ES implementations, many organizations focused on purportedly least cost, rapid ES implementation or a "technology-swap", in which scenario they are often reluctant to explicitly engage (i.e. to commit extra resources) consultants and software vendors for knowledge management activities during or subsequent to implementation, thereby possibly compromising the effectiveness of the ES-knowledgebase.

"*Knowledge retention* involves embedding knowledge in a repository so that it exhibits some persistence over time" (Argote, McEvily et al. 2003, p.572). The repository may be an individual or an information system. The individual's retained knowledge evolves through their observations, experiences and actions (Sanderlands and Stablein 1987). Gable et al. (1998) observed "staff poaching" and "knowledge drain" due to the ES skills-shortage during the latter half of the 1990's, thereby highlighting the importance of organizational knowledge retention strategies for lifecycle-wide ES-success.

Gupta and Govindarajan (2000) conceptualized *knowledge transfer* in terms of five elements and emphasized the importance of the richness of channels of knowledge transfer. Knowledge transfer channels can be informal or formal (Pan, Newell et al. 2007), where unscheduled meetings, informal gatherings, and coffee break conversations are examples of the informal transfer of knowledge. Although informal knowledge transfer promotes socialization and could be effective in small organizations, it precludes wide dissemination (Alavi and Leidner 2001). Formal transfers, such as training programs, ensure wider distribution of knowledge and suit highly context-specific knowledge. Formal training is particularly effective and important with the introduction and operation of large and complex systems like ES (Pan and Chen 2005). Thus, the focus of knowledge transfer in this study is limited to formal knowledge transfer through training programs.

Markus (2001) suggests that the source of competitive advantage resides not in the knowledge itself, but in the *application of the knowledge*. Effective "knowledge application" is important in every phase of the ES lifecycle, particularly in maintenance and upgrades (Markus, Axline et al. 2003), and is a frequent organizational concern that appears to be closely related to ES-success (Ross, Vitale et al. 2003; Sumner 2003).

4. DEVELOPING THE SURVEY INSTRUMENT

The objective of this research is to assess the impact of organizational size on broad KM activities[1]. Using the four phases identified through the literature, 10 survey items (see table 2) were designed for knowledge creation, retention, transfer and application[2]. All items were scored on a seven-point Likert scale with the end values (1) 'Strongly disagree' and (7) 'Strongly Agree', and the middle value (4) 'Neutral'. In addition to the items of table 2, the questionnaire included two criterion items: (11) 'Users have sufficient <name of the application>[3] knowledge' and (12) 'Overall, <name of the application> system related knowledge has been managed satisfactorily'. The first criterion items gauges the whether the respondent has adequate knowledge and the second item gauges the respondent's perception of overall KM-process.

Knowledge Creation	
1	Overall, <name of the application> knowledge possessed by the vendor has been appropriate
2	Overall, <name of the application> knowledge possessed by the consultants has been appropriate
3	Overall, <name of the application> knowledge possessed by the agency has been appropriate
4	Overall, knowledge of the agency, possessed by the vendor has been appropriate
5	Overall, knowledge of the agency, possessed by the consultants has been appropriate
6	Overall, the Agency knowledge of itself (e.g. Business processes, information requirements, internal policies, etc.) has been appropriate
Knowledge Retention	
7	Overall, <name of the application> staff and knowledge retention strategies have been effective
8	The Agency has retained the knowledge necessary to adapt the SAP system when required
Knowledge Transfer (formal)	
9	Training in <name of the application> has been appropriate
Knowledge Application	
10	Overall, <name of the application> knowledge has been re-used effectively and efficiently by the agency
Criterion Item	
11	Users have sufficient <name of the application> knowledge
12	Overall, <name of the application> system related knowledge has been managed satisfactorily

Table 2: The Knowledge Management Measures of the study

5. THE STUDY CONTEXT

The study gathered data from 27 organizations running a market leading Enterprise System for more than a decade. The 27 organizations, belonging to a state Government in Australia, were the first Australian state government to have implemented a common financial management software state-wide. In 1995 the state Government commenced implementation of the Financials module across all state Government agencies (later followed by Controlling, Materials Management and in some agencies Human Resources) and soon became one of the largest Enterprise System installations in Australia. The state Government approach was very much focused on using the Enterprise System as a common reporting and financial management tool. The broad objectives of the new Enterprise System were to: (1) support the 'Managing for Outcomes' (MFO) framework and financial management improvement activities, (2) encourage best practice resource management across state Government, (3) facilitate the consolidation of state Government financial information, (4) meet the business needs of agencies and (5) achieve economies of scale in main operations. Moreover, all organizations having: (1) the same Enterprise System software application, (2) the similar versions of the Enterprise System, (3) in the same phase of the ES life cycle,

[1] The intention of this research is provide a high-level analysis of the KM activities. We preclude from investigating the detailed KM phases and the possible interrelationships between the KM phases.
[2] In this research paper, Knowledge Application and Knowledge Use are used interchangeably.
[3] In the data collection instrument, 'the name of the application' was replaced with the word 'SAP'.

and (4) installed Financial Accounting and Controlling, Materials Management modules created a unique homogeneous environment increasing the comparability of the data.

In recent times, despite much anticipated benefits, a relatively small agency that provides corporate services to a group of other small agencies demonstrated their dissatisfaction with the Enterprise System. It is believed that, even though the Enterprise System provided with much rich functionality to this organization, the senior management purportedly believed that the system was too complex and too expensive for a small organization. After three years of using the implemented Enterprise System, the agency decided to replace that with a locally-owned, small scaled Enterprise System. This contextual background further questions the preposition in the literature discussion on whether the small organizations receive adequate benefits from Enterprise System investments.

6. RESULTS AND ANALYSIS

A total of three hundred and nineteen (319) responses from twenty-seven (27) organizations were gathered using a web-survey instrument. Nine responses were removed from the analysis due to missing values and perceived frivolity. Discussions with the strategic management in organization managing the ES for other organization revealed that they employ the *number of user licenses* to usefully classify organizations, where the number of user licenses below 200 is considered "Small", 200 – 999 are considered "Medium" and above 1000 are considered "Large". Employing those guidelines, the 310 respondents were classified yielding, 66 respondents from Large organizations (21%), 196 from Medium (63%) and 48 representing Small organizations (16%). The distribution of organizations is representative of the organizations in terms of the Enterprise System Application in the sample organizations. The analysis below investigates whether the respondents of the three organizational sizes demonstrate differences in relation to the Knowledge Management (KM) activities derived through the literature. Finally, a path model is developed to assess possible differences in the relationship between the antecedent (KM outcomes) and the ES impact.

The analysis below has the objective of assessing whether the organizational size impacts the perceived value in the in four KM phases. Figure 1 depicts the mean scores of the goodness of knowledge management process items.

Observing figure 1 below, the following inferences are made:

1. Knowledge Creation – as per the description above, the six items of knowledge creation attempted to gauge the knowledge brought-to-bear by the client, consultant and the software vendor. Observing figure 1, it is evident that the differences between the three organizational sizes in relation to the knowledge creation items remain minimal. However, considering the knowledge within the client organization at the time of the implementation, it was evident that the large organizations (mean value of 4.3) possessed more internal knowledge than that of small organizations (mean of 4.0)[4]. This is consistent with the literature on software implementations, where the small organizations lack internal IT expertise. Since the same external consultants and the software vendors were employed in all 27 organizations, there were no substantial differences between the three organizational cohorts.
2. Knowledge Retention – From figure 1 (Highlight A) it is evident that there are substantial differences between the three organizational sizes for knowledge retention activities, with the mean scores descend with the declining organizational sizes (i.e. large organizations with the largest mean score and the small organizations with the smallest mean score). The observed differences are then statistically tested using the paired t-test, where the observations are confirmed at significance level .01. This provides the initial evidence of the inability of the small organizations to retain ES related knowledge created during the ES implementation. This is in alignment with the findings of Gable et

[4] Using survey item 6 in table 2.

al. (1998) who observed "staff poaching" and "knowledge drain" due to the ES skills-shortage during the latter half of the 1990's, we emphasis the lack of planning and resources in small organizations to retain necessary knowledge for the lifecycle-wide ES-success.

3. Knowledge Transfer – (Figure 1 – Highlight B) Formal knowledge transfer methods are particularly effective and important with the introduction and operation of large and complex systems like ES (Pan and Chen 2005). Investigating the appropriateness of formal knowledge transfer mechanisms, we observe substantial differences between the three organizational sizes where the mean scores descend with the declining organizational sizes. The observed differences are then statistically tested using the paired t-test, where the observations are confirmed at significance level .01.
4. Knowledge Re-use – The differences between the three organizational sizes tend to minimize in relation to Knowledge Application. However, it is noted that, given the issues pertaining to knowledge retention and transfer, the ES-knowledgebase in small organizations remain relatively infertile.

Summarizing the key observations, it is clear that despite the 'equal' knowledge creation at the time of the implementation (perhaps as a result of all organizations being part of a large Enterprise System implementation project where the software vendor and the consultants remained the same across all organizations), small organizations tend to face issues in relation to retaining, transferring and using knowledge throughout the ES-lifecycle. Consequently, small organizations demonstrate lower satisfaction in their knowledge management activities (see figure 2).

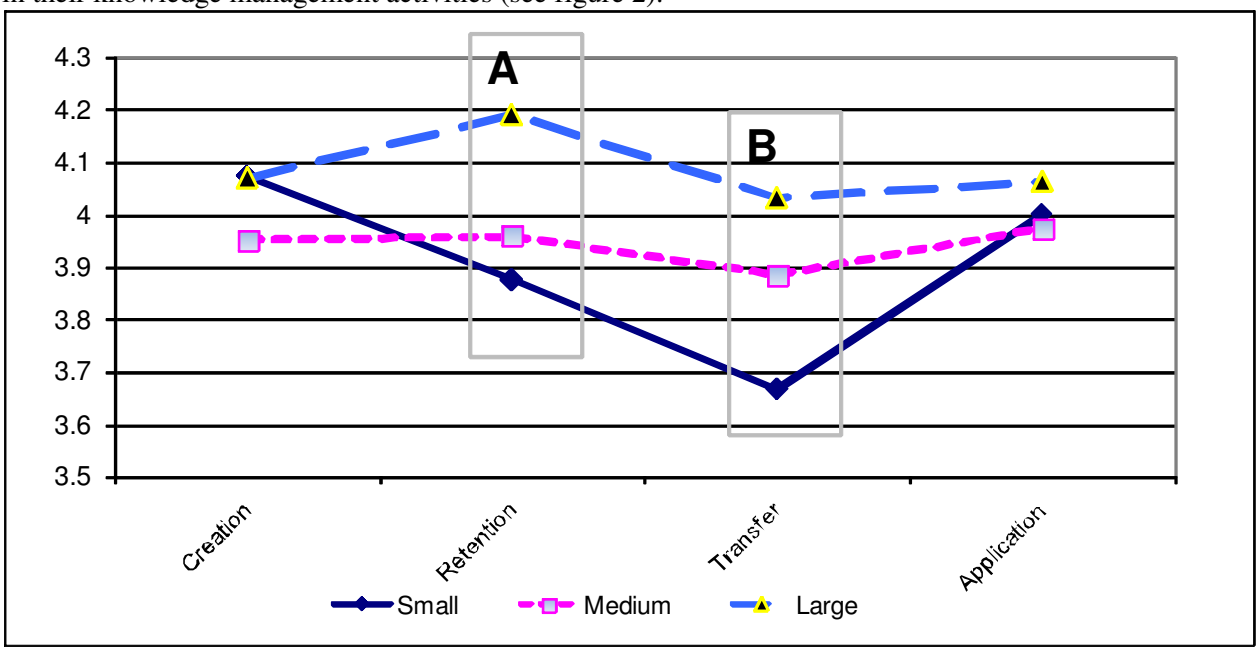

Figure 1: Descriptive Statistics of the KM process

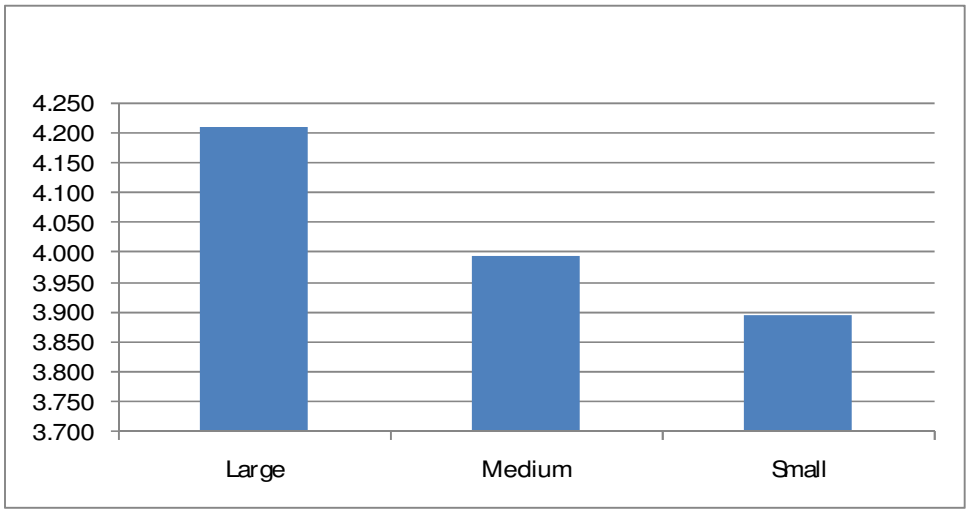

Figure 2: Satisfaction levels of the three organizations

The aforementioned findings influence the research path model testing below. Through descriptive statistics, it is observed that managing knowledge at the two main stages of the ES lifecycle – pre and post ES implementation stages – could be somewhat different in the three organizational sizes. Even though our initial intention was to test a research model for Small, Medium and Large organizations for their overall Knowledge Management activities, we were loathed to distinguish the KM activities of the PRE and POST implementation stages.

The path model (in figure 3) has been developed and tested using the Partial Least Squares (PLS) procedure (Wold 1989). The SmartPLS software (Ringle 2005) has been employed to test the purported differences across the three organizations in relation to the implementation and post-implementation stages of the ES lifecycle. Along with the observations from figures 1 and 2, herein we argue that, having passed approximately a decade since the initial ES implementations and have reached a mature stage of the lifecycle, organizations require a lifecycle wide knowledge management strategy for ES. The three PLS models below investigate the relationship between KM at *implementation* (knowledge creation), *post-implementation* KM activities and their relationship with the overall goodness of the KM process[5].

Results observe the strength of the paths between KM activities during and post ES-implementation (independent variables) and the overall goodness of the KM process (the dependent variable). It is evident that the r-square of the overall goodness of KM process, decline with the declining organizational sizes, attributing to the overall goodness of KM activities in large organizations. More importantly, observing the path coefficients of the *during* and *post implementation* paths, it is clear that larger organizations tend to explain the overall goodness using the KM activities *post implementation*, compared to the small organizations where the overall goodness is *still* relying on the knowledge creation that had taken place.

7. CONCLUSIONS

This research investigated the popular conviction that Enterprise Systems are well-suited for large organizations than small and medium organizations. Rather than investigating the above phenomenon

[5] It is noted that the model below (figure 3) is a linear representation (reduction) of the complex, dynamic and iterative process. Thus, the potential limitations arising from measuring a complex socio-technical construct as a linear relationship are acknowledged. Nonetheless, it is believed that any attempt at operationalization and quantification necessitates simplification.

using the "system success" viewpoint, this study focused on an important "antecedent" of Enterprise Systems. Gathering data from 310 respondents, this study investigated the knowledge management process of 27 small, medium and large organizations. The main preposition of the study was that all organizations require a lifecycle wide knowledge management strategy to reap benefits from Enterprise Systems. Based on this premise, the study investigated the goodness KM process (at the ES-implementation, knowledge creation by consultant, vendor and the client organization, post implementation activities such as knowledge retention, transfer and re-use) in the three organizational cohorts.

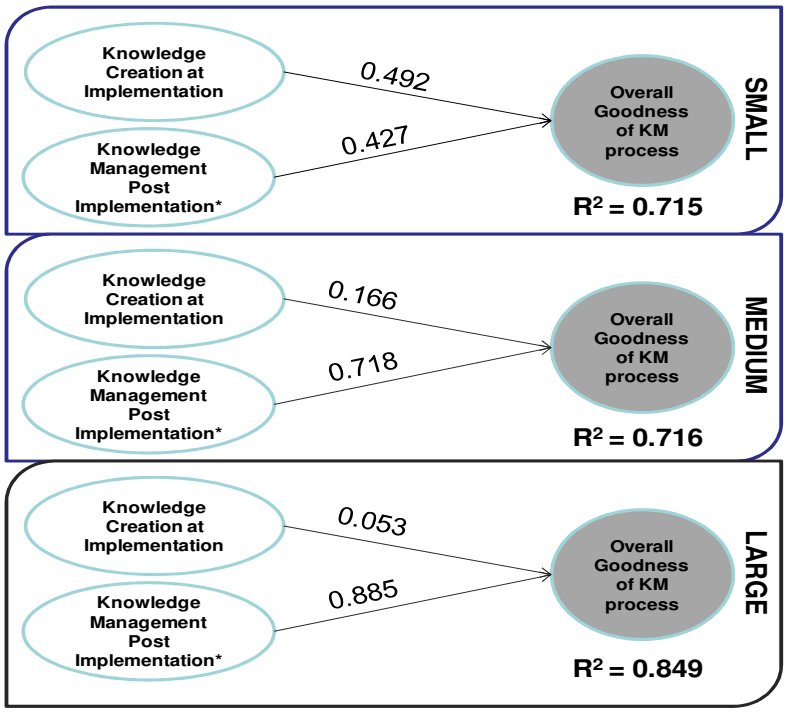

Figure 3: Path model of knowledge management (* post implementation activities include: knowledge retention, knowledge transfer and knowledge application and measured as per table 1; all values are significant at .005)

The homogeneity of the study context – where all the sampled organization having implemented the same Enterprise System, similar modules and are at the same phase of the lifecycle – provided a distinct strength to the study, where the results are less vulnerable to extraneous factors.

The study results demonstrated that, even with similar knowledge creation outcomes (especially given the same consultants implemented the same ES in similar contexts), small and medium sized organizations demonstrated lower mean scores in relation to lifecycle wide knowledge management activities (i.e. transfer, knowledge retention and knowledge application). It was also observed that respondents from small and medium organizations reported lower levels of satisfaction towards the overall goodness of the knowledge management in their organizations. More interestingly, a path model developed to assess the goodness of KM process found that compared to large organizations, small organizations still assess the goodness of knowledge management process in light of the knowledge created at the time of the implementation. This assessment is quite different in large and medium organizations, where the assessment of the goodness of KM process is largely based on the post-implementation KM activities.
These findings highlight the capabilities (or lack of) of small organizations to maintain a lifecycle wide ES knowledge management strategy, even with the same levels of knowledge creation at the time of the ES implementation. Triangulating these findings with the findings of prior studies reported in the literature

review, it is plausible to associate these deficiencies in small organizations to: (1) lack of adequate resources, (2) high reliance on external expertise in system implementation, (3) lack of IT sophistication and (4) lack of knowledge retention strategies to minimize knowledge drain. At a time where the Enterprise System vendors are moving aggressively towards scaled-down systems specifically targeting at small organizations, the study results provide some caution over long term sustainability of ES for small organizations.

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