

On-premise ERP Organizational Post-implementation Practices *Comparison between Large Enterprises and Small and Medium-Sized Enterprises*

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Abstract: This paper presents a multiple case study, which was aimed at identifying similarities and differences on how companies of different sizes operate after ERP system go live (post implementation phase). The study has found several differences and similarities and concluded that the differences are caused by the differences in company structures, sizes, financial constraints and decision making processes. Large Enterprises (LEs) often have in-house competence which Small and Medium-Sized Companies (SMEs) usually lack, and this leads to SMEs to depend on external sources, which makes the operations slightly different. SMEs also focus on their technical operations, often disregarding strategic planning, and this leads to higher risks.

1 INTRODUCTION

Enterprise Resource Planning (ERP) is known to improve efficiency, performance as well as productivity, and it is regarded as a strategic resource by organizations, providing competitive advantage and a strong market position (Law and Ngai, 2007). ERP is also known to improve operational efficiency for organizations (Shang and Seddon, 2000).

However, ERP implementation can be a costly and complex exercise, as it involves a large amount of investments, which are usually doable only for very large corporations (Andriole, 2006). Small and Medium Enterprises (SMEs) are however rapidly becoming the economy backbone around the world (IDC 2007), and therefore ERP vendors have been diverting their attention toward SMEs by developing simplified solutions from both the organizational and technological points of view (Chen, 2001).

Over the years, research on ERP in SMEs has been growing. Today, many empirical studies have concentrated on ERP adoption, success factors and implementation challenges. Willis and Willis-Brown (2002) pointed out that even if the ERP system is successfully implemented, the ERP journey does not end at the “go-live” point, indeed it is where real challenges begin (Hillman Willis and Hillary Willis-Brown, 2002). This phase is referred to as the post implementation phase.

While SMEs are rapidly implementing ERP in order to compete on the market and to gain competitive advantage, ERP systems implementation remains one of the most risky and costly exercise a company can get involved in (Lenart, 2011). In addition, SMEs and LEs are different, hence there cannot be one-size fits all solutions. So far, most of the studies have been focusing on LEs, more so in developed countries. This study aims to compare organizational practices that take place in LEs and in SMEs in Namibia, during the post implementation phase in order to understand issues that companies of different sizes face and how they can be solved. It also looks into factors that contribute to failure in the same phase and how best they can be handled.

The paper seeks to answer the following research questions:

- 1) How do ERP post implementation practices differ in LEs and SMEs?
- 2) What causes failure in the post implementation phase?

The objectives of the research are to gain a deeper understanding of different practices that take place in the post implementation phase for both LEs and SMEs, and to identify factors that companies should focus on in order to have a successful post implementation phase. Companies of all sizes are increasingly adopting ERP systems, but failure rates

remain high. SMEs usually have limited resources and cannot afford to invest their resources in systems resulting in failure. This research is therefore important to understand how companies of different sizes operate, after the completion of ERP systems and to make recommendations for a successful post implementation.

The rest of the paper is organized as follows: Section 2 presents a literature review, Section 3 describes the research method, Section 4 presents the results, followed by Section 5 that presents the findings. Section 6 discusses the findings, while Section 8 concludes the paper.

2 RELATED RESEARCH

2.1 Post Implementation Phase

The ERP post implementation phase starts as soon as the system goes live into the hands of the users and lasts until the system is replaced with a new one (Markus and Tanis, 2000). After an ERP system is implemented in an organization, practices such as review, evaluation, support, performance evaluation, and maintenance take place in order to ensure benefit realization (Nicolaou, 2004; Ng, 2001). Infrastructure management support, business process reengineering, upgrading systems and network resource planning are also very crucial in this phase (Esteves and Pastor, 1999). Ng (2001) pointed out that, apart from maintaining the system for the purpose of realizing maximum benefits, organizations also update their systems in order to keep up with the support from the vendors, who sometimes support a certain version for a certain period, after which a client has to maintain it themselves (Ng, 2001).

Several studies have reported that the main reason why ERP post-implementation failure occurs is mainly due to inadequate training, lack of top management engagement, issues regarding external consultancy, change management, and alignment of the ERP system with the business objectives (Davenport, 1998; Chang et al., 2008; Ruivo et al., 2012; Peng and Nunes, 2010; El Sayed et al., 2013; Kiriwandeniya et al., 2013). Hustad & Olsen (2011) in their study found training to be a must after implementation, as some users avoid using the system due to reasons such as anxiety and lack of confidence. Similarly, Soja (2006) identified user resistance, lack of skills and interdepartmental communication as constraints that can hinder ERP post implementation success.

Mantakas & Doukas (2011) did a study on ERP use practices in Greek SMEs, particularly analyzing business processes use practices and deficiencies. They found ERP system use deficiencies to be related to the sizes of the companies. The smaller the company, the more lack of know-how and insufficient manpower (Mantakas and Doukas, 2011).

2.2 What Characteristics Distinguish SMEs from LEs?

SMEs are known to be poor in human, financial and material resources (Iacovou et al., 1995). Due to this, they are seldom willing to commit a large portion of their resources to high fees that come with ERP implementation (Buonanno et al., 2005). They also lack strategic planning of information systems (Levy and Powell, 2000). When compared to large organizations, SMEs are at a disadvantage of being unable to attract highly qualified workers, and this leads to lack of competitiveness (Westhead and Storey, 1996).

Hsin and Chin-Fang (2005) have found that companies of different sizes have different ways of managing their information systems. A system can be managed by over 200 employees in an LE, whereas the same system can be managed by one employee in a small company (Hsin and Ching-Fang, 2005).

SMEs do not have formal structures, and their management teams are usually small and focus on what seems best for an organization. In addition, small company owners often make all business decisions, while decision making authority in LEs is scattered among different management layers in large organizations (Spanos et al., 2001).

Given the fact that post implementation poses high risks of failure, it is very crucial for research to suggest methods of improving post implementation results. The previous studies (Chang et al., 2008; Ruivo, Peng and Nunes, 2010; El Sayed, 2010; Kiriwandeniya et al., 2013) have not, however, specified whether the practices and failure factors found are unique for companies of certain sizes or whether they are size independent. The studies are either done solely in LEs or in SMEs. Mantakas & Doukas (2011) for example specifically focused on SMEs in their study and recommended the role of the company size to be investigated.

This study aims to fill this gap and provide understanding of the differences and similarities between large and small enterprises.

3 RESEARCH METHOD

In order to gain first hand insight into ERP post implementation activities, a multiple case study methodology was employed, and six companies were selected for the study. A multiple case study is used to compare or analyse a particular phenomenon in diverse settings (Walsham, 1995). A multiple case study approach was chosen to enable us to compare different practices in LEs and SMEs.

An explanatory case study was chosen for our study, particularly because we wanted to obtain information from users about how and why certain events take place.

Given our desire to analyse interviews and to build theories from them, we have chosen to use the three coding techniques of grounded theory (Corbin and Strauss, 1990). These include open coding, axial coding and selective coding. Open coding according to Glaser and Strauss (1967) is the first step that takes place in the grounded theory coding process. It is a process of collecting raw data and breaking it, and categorizing it into segments in order to make it easy to interpret (Glaser and Strauss, 1967). In this step, we categorized our data into different themes, followed by axial coding, whereby the relationship between different categories were established. In the selection coding stage, we established the core category. A core category represents all categories and groups them under one umbrella.

3.1 Data Collection

The companies interviewed ranged in size from 120 employees to 5000 employees. We have conducted face to face interviews and in addition we have also conducted some interviews on skype due to the interviewees being in a different country. Altogether 6 companies were contacted. Three of them are LEs, while the other three are SMEs according to the definition of SMEs based on the EU commission guidelines (European Commission, 2005). The guidelines define that an SME is the one with less than 250 employees with an annual turnover not exceeding 50 million euro. The participants ranged from CEOs, IT Managers and Business Analysts (Table 1). The criteria used was that the companies have implemented ERP at least two years before, because according to Velcu (2007), a company can only realize benefits after two years of implementation.

We used semi structured questions that are aimed at gaining insight into the post implementation activities discovered from the literature review

Table 1: Companies and Interviewees.

Case	Interview role	Company Type	Company Size
A	IT Manager	SME	120
	Owner		
B	Business Analyst	LE	5000
	IT Manager		
C	SAP System Analyst	LE	1134
	SAP System Analyst		
	ERP Manager		
D	Owner	SME	240
	IT Manager		
E	Owner	SME	200
	IT Manager		
	End user		
F	Senior Business Analyst	LE	1500
	Business Analyst		

such as: Maintenance, Decision Making, Benefits Evaluation, Consultant involvement and Training (Somers and Nelson, 2004).

4 RESULTS

Data analysis was performed using a qualitative research analysis tool ATLAS.ti. As previously stated, we followed the three coded technique grounded theory method by Strauss and Corbin (1967). In the study, we focused on activities and issues related to the post implementation phase. As we read through the interview questionnaires, we started making open codes based on these activities and writing memos related to the codes. As a result, 143 codes were produced.

4.1 Categories

According to Seaman (2008), when the study objectives are clear as it is the case in our study, a set of preformed codes can be constructed before the data collection process, and these can be used to categorize the data. These codes can be initialised from the research questions or from predefined variables of interest. This is very useful for getting the process started (Seaman, 2008). We have opted to use this approach to code our data. Our categories were formulated based on the research questions and on the themes used to construct interview questions. Table 2 shows these categories.

Table 2: Categories and their descriptions.

Categories	Descriptions
Performance & Usability	This category aims at looking at: a) User involvement, b) Performance measurement c) Training
Infrastructure management support	This category looks at a) Management Influence b) Decision making
Maintenance	This category includes: a) System upgrades b) External consultancy and Vendor involvement

5 FINDINGS

5.1 Performance Measurement

Performance measurement is seen as a crucial element for managers directing projects, to know the effectiveness of the system and to know where to institute changes if necessary. We observed a difference on how different organizations value this exercise. All LEs interviewed did not do any performance evaluation for their ERP systems. *“The benefits were as clear as daylight for everyone to see. The previous system only had ± 20 users, the SAP ERP solution has over 600 users.”* **ERP Manager, Case C.** However all SMEs admitted to have appointed auditors to evaluate the invested systems. *“Internal Auditors came to evaluate what was delivered vs what was promised and advised management and the board on the investment status, as well as recommendations on the way to rectify problems identified.”* **Owner, Case E.** Based on this observation we have formulated our first hypothesis: **SMEs seem to value performance evaluation more than LEs.**

5.2 User Involvement

It is crucial for users to be involved in the ERP project from the beginning, in order for them to realize the system importance. Even though this is not part of the use and maintenance phase, involving users in the implementation process is very important in order for them to understand its importance. Chow and Leitch (1997) stated that user involvement leads to perceived usefulness of the system that leads to behavioural intention. Remarkably, we have found that not all companies involve users from the beginning. The studied LEs claimed to discuss the objectives of the system with users and included them in workshops and meetings. *“The objectives and scope were*

discussed through various meetings, emails, communicate and memos and shared with everyone.” **SAP Business Analyst, Case C.** The studied SMEs however preferred to have users get involved only after the project was complete, which could have an effect on their intention of use.

Decision making was also approached differently in different organizations. Studied LEs also claimed to have involved different line managers in their decision making before management made the final decision. Whereas the studied SMEs preferred not to involve technical teams or line managers in their decision making. Line managers did not have decision making authorities, neither do they have any say in strategic planning. Top management made all the strategic decisions and left the line managers with the responsibilities of taking care of operational activities. *“We use a top down approach. We have to get authorization from CEO on all IT related matters. We are however empowered to make recommendations that are then forwarded to management for final endorsement. But we do not have authority to make any decisions.”* **IT Manager, Case E**

The observation in Case E suggests that, no matter how vital a certain action is, it will not necessarily take place if management does not concur.

Based on this observation, we have formulated our second hypothesis: **SMEs use top down decision making approach in their ERP projects, while LEs use the bottom up approach.**

5.3 User Effectiveness

Previous research has identified user resistance as one of the constraints that hinder ERP success (Soja, 2006). However, based on the findings from all the companies that were interviewed, the users were willing to use the systems, mostly due to the fact that training was provided. On-going skills enhancement is a crucial post-implementation activity needed to maximize efficiency (Somers and Nelson, 2004). All organizations claimed to have sent employees for training. LEs concentrated on functional training. They also trained selected users to enable them to train others. Therefore, user guidance is available during actual use. The main problem experienced in studied SME regarding training was that, it was provided before go-live, resulting in users lacking confidence when they use the actual system. They needed the training to be repeated whenever they did not understand anything. However, they did not have a dedicated personnel to train them. *“The problem is, we do not have a dedicated trainer in the company.”*

But we have training manuals that come as part of the training package, but it is not always sufficient. Sometimes we are really stuck that we have to call in a consultant.” **Business Analyst, Case D**

With this observation we have formulated our third hypothesis: **On-going enhancement positively affect user effectiveness, and LEs seem to invest in on-going enhancement more than SMEs.**

5.4 Management Influence and Resources Dedication

Management support is essential when it comes to resources dedication. If management understands the need for the system, they will be open to avail resources should a need arise. The level of IT knowledge of the CEO in the company also matters in SMEs, because unlike in LEs, decision making usually lies with one person and if they do not understand the benefits of having an up to date system, they will not be keen to spend extra costs.

The LEs have indicated to always make room for releasing funds when necessary. *“The company has always made funds available to improve the system”* **Business Analyst, Case C.** However for SMEs, the management tries to stick to budget as much as possible. *“We weight the benefit against the cost, to measure the value addition. We try to stick to the budget otherwise you end up spending additional costs that you did not consider.”* **Owner, Case A.** *“Few licenses were purchased and we only discovered at go-live that we were under-licensed. Hence, we had to pay more for additional licenses. So as long there is a strong business case that will yield benefits, we unfortunately have to fork out that extra.”* **IT Manager, Case E.**

With this observation we have formulated our fourth hypothesis: **LEs are more open to out of budget resources dedication than SMEs.**

5.5 External Consultancy and Vendor Involvement

Literature indicates that due to a company’s lack of experience, companies usually hire a consultant with experience (Somers and Nelson, 2004). External consultants offer outside expertise and knowledge. It has been observed that all studied companies have used external consultants, however not for the same purpose. The SMEs used consultants for overall project management as well as independent quality assurance. Since these organizations are core business focused, they needed external consultants to assist them in case of system difficulty. Whereas LEs only

needed consultants for producing end user manuals and blueprints. LEs have indicated to have internal project management teams, whereas SMEs lack in-house expertise. *“At the time of implementing ERP, there was no internal project management capability and hence an external consultant was hired to oversee and manage the implementation process.”* **Owner, Case D**

As a result of the implementation process in SMEs being managed by external consultants who might not have all the necessary information, results can be an unsatisfactory system. This happened in Case C, whereby requirements were not fully understood. *“The document management system requirements were not properly understood, hence the system is not fully operational as expected. There were a number of critical systems functionalities that were not clearly defined and as a result not implemented. So the system does not represent all business processes. In this case, further customization became necessary.”* **IT Manager, Case E**

Somers & Nelson (2004) stated that a relationship between a customer and the vendor is very crucial, whereby a vendor can enhance the customer’s efficiency (Somers and Nelson, 2004). A project usually relies on vendor support even after it is complete. All organizations interviewed have a good relationship with the vendor. Most ERP vendors usually give technical support until twelve to eighteen months after the release of a new version. All interviewed companies had up to date versions of their systems. This somehow explains that, when companies implement the ERP, they understand that they would need to be paying for new licenses after a certain period in order to have their vendor’s support. *“It is very critical to have a good relationship with the vendor, you always need them along the way. We are on a maintenance agreement with them, and they are also offering us support services.”* **Senior Business Analyst, Case F**

With this observation we have formulated our fifth and sixth hypothesis: **Unlike LEs that have dedicated internal project management teams, SMEs involve external consultants in requirements decision making, which can have a negative effect on system satisfaction.**

Hypothesis 6: Company size has no effect on the vendor relationship.

5.6 Issues

All companies have admitted to have faced some issues regarding their implemented systems. Some problems were common in all organizations, while

others were common in SMEs only. All companies regardless of company size complain about the unfriendliness of the system. *"It is too complex, continuous training is a must. I mean, users need to have access to training in order to help reduce anxiety. Even eLearning maybe, something affordable."* **IT Manager, Case A.** Most companies have also complained about lack of flexibility. In addition to these problems, all studied SMEs have indicated high cost as a major issue, as they have limited funds. Two of them also indicated the problem of functionalities not being implemented due to misunderstandings of requirements, and these were only found out after sign off. *"Lack of funds is our major problem. We cannot implement other modules now, considering how expensive it is to maintain the existing ones. But don't get me wrong, the investment was totally worth every penny."* **Owner, Case D.**

With this observation we have formulated our seventh hypothesis: **Regardless of investments made on the ERP systems, all organizations experience some post implementation issues.**

6 DISCUSSION

The study generated seven hypotheses that describe how organizational activities and players differ in SMEs and LEs. We have identified several different point of views regarding post implementation practices in companies of different sizes.

Patil et al (2012) in their study have argued that it is important to evaluate the performance of the ERP system in order to ensure that it reached its goal. We have found that this is commonly practiced in SMEs. LEs did not prioritise performance evaluation. However, it is evident that the SMEs found it important to take count of the value of their money, since ERP implementations are quite costly.

We have also observed that LEs involved employees from the beginning, discussing the objectives of the system with them. However SMEs often kept the communication about the system objectives at the management level. End users were seldom involved in any planning or meeting discussions. As per El Sayed (2013)'s study, user involvement contributes to ERP success. Somers & Nelson (2004) also argued that not involving users in the project results in user resistance. Therefore it is important for SMEs to involve end users more in discussions that may have an impact on their roles. Similarly, line managers did not have any decision making authorities, neither did they have any say in strategic planning. Top management made all the

strategic decisions and left the line managers with the responsibilities of taking care of operational activities. This has shown that top down approach lacks transparency.

Training is vital for every company adopting ERP, due to its complexity. This is regarded as one of top success factors that lead to ERP success. In our study, we have found that all companies had their users trained. The difference however is that, unlike LEs, SMEs did not invest in in-house training. According to Chang et al.(2008), enhancement of skills should be ongoing in the post implementation phase. Hustad & Olsen (2001) found the same results, which suggested that on-going training should be implemented to avoid anxiety and lack of confidence.

Our study has found that the studied LEs usually made funds available for extra costs that may arise. We have observed however that SMEs tried to stick to budget as much as possible. This could probably be a result of their lack of funds. However as Reel (1999) has stated, it is very important to dedicate all the necessary resources to a project to avoid its failure. Therefore it is recommended for SMEs to study the necessary resources before deciding to implement ERP.

External consultants are known to be of importance in ERP projects, as they bring experience and knowledge to the organization. We have found that SMEs also outsourced their project management activities to external consultants, because they often do not have a project management team in-house. As mentioned by one SME employee, the company has experienced missing critical functionalities that were not implemented because they were not understood. This finding shows that even though external consultants come in handy, they may not always understand the company's procedures and objectives. Therefore it is important to involve in house employees on the project management team to oversee the work done by external consultants.

We have observed that all organizations interviewed have a good relationship with the vendor and enjoy the vendor's support regarding maintenance and other technical services. This was common in all organizations. Many have claimed to have a contract with their vendors for certain services. This goes to show that all the companies understand the importance of maintaining a good relationship with the vendor, in order to gain lifelong strategic values.

As stated by Iacovou (1995), SMEs usually lack human and financial resources, therefore they are careful when it comes to spending. This has been observed in this study, as many issues experienced in

SMEs are related to cost. Since ERP implementation involves ongoing costs, such as those that result from system upgrades and maintenance, companies found themselves spending more than they have planned. However this is necessary to ensure the system achieves its desired results.

7 CONCLUSIONS

This study focused on activities and players in the ERP post implementation phase. We have observed that there are some activities that take place in the studied SMEs more than in LEs, such as performance evaluation. There were also some practices such as in house training that have been observed to take place in LEs but not in SMEs. There is a need to have tailored training for SMEs based on their implemented system, in order to cut costs for bringing in a consultant, since they do not have the in-house technical man-power. Their training usually takes place before the system go live and this is not efficient.

We have also found differences in the decision making process regarding ERP between companies of different sizes. The study has found that the main reasons why activities take place differently in SMEs and LEs is because of the differences in company structures, sizes, cost constraints and decision making processes.

SMEs can learn from LEs to involve more employees in the requirement specification process, in order to allow them to state their processes better and to have satisfactory systems.

The grounded theory method undertaken in this study has allowed us to build theory from our findings. However our findings need more observation in more companies, also looking at small, medium and micro companies as separate entities.

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