ERP IMPLEMENTATION CHALLENGES
Vendors' Perspective

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Abstract: Enterprise Resource Planning (ERP) systems have transformed the way organizations go about the process of providing information systems. They promise to provide an off-the-shelf solution to the information needs of organizations. Despite that promise, implementation projects are plagued with much publicized failures and abandoned projects. Efforts to make ERP systems successful in organizations are facing challenges. The purpose of the study reported in this paper was to investigate the challenges faced by organisations implementing ERP systems in Kenya based on consultant point of view. Based on the factors identified from the interview, a survey was administered to ERP consultants from five Kenyan organisations that were identified as having a key role in ERP systems implementation in their firms in order to assess the criticality of the identified challenges. A factor analysis of these items identified six underlying dimensions. The findings of this study should provide to management of firms implementing ERP systems a better understanding of the likely challenges they may face and put in place appropriate measure to help in mitigating the risk of implementation failures.

1 INTRODUCTION

An Enterprise Resource Planning (ERP) system is an integrated set of programs that provides support for core organizational activities such as manufacturing and logistics, finance and accounting, sales and marketing, and human resources. An ERP system helps the different parts of an organization share data and knowledge, reduce costs, and improve management of business processes. In spite of their benefits, many ERP systems fail (Stratman and Roth, 1999). Implementing an ERP system is a major undertaking. About 90 percent of ERP implementations are late or over budget (Martin, 1998) and the success rate of ERP systems implementation is only about 33% (Zhang et al 2003, Arif et al., 2005).

Over the past few years limited research has been conducted about ERP implementation issues: mainly case studies in individual organizations have been reported. A major problem with such ERP case studies is that very few implementation failures challenges resulting to these failures have been recorded in the literature, and thus the reasons why implementations fail are not known to practitioners and researchers. That is a motivation toward conducting empirical studies to explore challenges that affect ERP systems implementation. In the context of ERP project implementation, challenges represent major pitfalls which if not addressed then a project stands little chance of success. This study examines the challenges faced by user and vendor organizations implementing ERP systems in Kenya. Consultants from five consulting organizations, who were identified as having a key role in ERP systems implementation, were interview in stage 1 of the research in order to empirically identify challenges faced by their client organizations during ERP implementation. A survey was then conducted to assess the criticality of the identified challenges which were perceived by respondents as posing high risk to successful ERP implementation.

This paper is organized in four sections. First ERP-related literature is reviewed. The next section introduces the research methodology, followed by the presentation of the results. The paper ends with the conclusions and implications for future research and practice.

2 RESEARCH METHOD

The choice of an appropriate research methodology is critical in guiding researchers on how best to meet research objectives. In this study, the purpose was to discover the perceptions and experiences of consultants involved in ERP implementation with regard to the challenges faced by the client organizations during implementation of ERP systems. The research was conducted in two stages. First staged involved an interview with consultants drawn from different functional areas in five consulting organizations who had been involved in ERP implementation at some stage. The second stage involved conducting a survey on the factors identified in stage 1 to assess their critically. The analysis has enabled the identification critical challenges experienced by organizations implementing ERP systems based on vendors' perceptions and experiences.

The target of the study was the consulting organizations that have been involved in ERP implementation in Kenya. The key informant method was used for collecting information in a social setting by surveying (or interviewing) a selected number of participants. Five consulting organisations participated in the study. We contacted the ERP project managers of each company in charge of ERP implementation. Questionnaires were sent to the ERP project managers of each firm, who forwarded the questionnaires to the project team members in charge of individual processes. Eight questionnaires were distributed and a total of six (75%) were returned. Of the companies that responded half are wholly locally owned while the other half are fully foreign owned with both categories having a workforce 20 to 40 staff. The vendors implemented a cross section of ERP solutions ranging from SAP, Oracle financials to others like Sage line 500. Of the vendors that responded, 38% implement Oracle Financials, followed closely at SAP (25%), BAAN, Navision and Ebizframe all equally had 13%.

The questionnaire consisted of two main parts: the company background and statements which expressed the challenges identified in stage 1 one of the study. The first part was designed to determine characteristics such as size of the company, ownership, location of company etc. The second part consisted of nineteen statements about the success factors of ERP systems implementation, derived from the literature review. The language used in the survey was both English and Kiswahili (national

language in Kenya). Translation was rather easy because Kenyans used original English terms for many technical and management concepts and especially for information systems and computing concepts.

The factors identified at the interview stage were included in the questionnaire and respondents were asked to state the extent they disagreed or agreed with the statements in a likert scale of 1-strongly disagree, 2- Disagree 3- Indifferent, 4-Agree and 5-Strongly agree. This method was employed on the grounds that it avoids the problems of having to consider ten challenges simultaneously in order to rank them. The data collected was then analyzed by using SPSS. Based on the responses, descriptive statistics, factor analysis (FA) and reliability tests were carried out to identify the critical challenges faced by user and vendor organizations during ERP implementation in Kenya and data validity respectively.

3 RESULTS

Based on the responses from the vendors and literature review, we identified 10 factors that could be considered as major challenges faced by organisations implementing ERP in Kenya. Table 1 show the factors in order of ranking.

Table 1: Ranking of challenges.

Challenges	Mean
High cost involved	4.99
Lack of IT skills among users	4.94
Poor ICT infrastructure	4.83
Data conversion problems	4.81
Inadequate time allocated for training	4.71
Integration problems	4.68
Government ICT policies	4.67
High staff turnover	4.61
Scarcity of funds	4.56
Inadequate preparation by employees	4.50

The individual mean value of the Likert rating scale is the popular usage indicator for measuring an item's importance, without regard to the other items: so the higher the value the more important the factor. All items are rated above the 3.0 scale (mid-point).

Table 2.

Challenges	Mean	F1	F2	F3
High cost involved	4.99	.792		
Lack of IT skills among users	4.94		.682	
Poor ICT infrastructure	4.83			.689
Data conversion problems	4.81	.815		
Inadequate time allocated for training	4.71		.792	
Integration problems	4.68	.610		
Government ICT policy	4.67			.556
High staff turnover	4.61		.651	
Scarcity of funds	4.56	.699		
Inadequate preparation by employees	4.50		.815	
Eingenvalue		2.58	2.21	2.07
Percentage of variance		18.5	15.54	10.78
Cumulative percentage of variance		37.96	22.7	40.16
Cronbach alpha coefficient		0.83	0.76	0.68

3.1 Factor Analysis

In an attempt to reduce the number of item (challenges), and to understand their underlying structure, a factor analysis (FA) was performed. FA is a data reduction technique that uses correlations between data variables. The underlying assumption of FA is that a number of factors exist to explain the correlations or inter-relationships among observed variables (Chatfield and Collins, 1992). For the present study, FA was performed on all nineteen variables using principal components extraction (Tabachnick and Fidell, 1989). The goal of this method is to extract maximum variance from the data set within each factor. It is basically used to reduce a large number of variables down to a smaller number of components. The measure of sampling adequacy for the twenty items was 0.87 indicating that the items were suitable for factoring (Kaiser, 1974).

A three-stage factor analysis was conducted with an orthogonal (varimax) rotation to obtain a stable factor structure (Rai et al., 1996), resulting in easily interpretable factors. Under this three-round factor analysis, items were omitted according to the following two criteria: (1) no loading greater than 0.45, or (2) loading greater than 0.45 on two or more factors (Kim and Mueller, 1978).

Table 2 shows the results of this analysis. A first factor analysis was conducted and produced five factors. According to the two criteria, one items was dropped. A second factor analysis on the remaining 9 items resulted in three factors and the dropping of one item. Finally, a three-factor structure was derived which kept a total of 8 items after three iterations. Factor 1 accounted for 37.96% of the total observed variation; factor 2 and 3 explained 22.7% and 16.4% of the total variation respectively. The three-factor solution (cumulative) explained 77% of the total observed variation. The minimum eigenvalue from a varimax rotation for which a factor was to be retained was set at 1.0 in order to satisfy the minimum eigenvalue criterion (Nunnally, 1978).

Factor 1, named "High cost further escalated by extensive customization", comprises four items relating to ERP system cost: High system cost, data conversion too involving, scarcity of funds, and integration problems. All consultant interviewed alluded to the fact that cost is a major concern for organizations implementing ERP systems in Kenya. The cost of ERPs implementation averages between Kshs. 100 to 500 million (USD 1.4 – USD 7 million). However, the cost of ERP implementation varies from one ERP to another. Baan and SAP, two of the ERP systems implemented by case organisations, charge software license fee charged based on: 1) the number users, 2) the type of users, 3) the number of master records in the database. Users are categorised based on what they can do or not do in the system.

Cost continues to be a concern for many organisations. In the case of SAP, their costing model seemed not favour Africa. For example, the cost charged per day per consultant is USD 1,200 plus and an additional hotel and overnight stay allowance of USD 400 charged per night. This is

three times above the amount charged in Asian continent like in India that is USD 600 per day. Implementation costs were found to be, on average 25% percent over budget. Organisations under-estimated support costs for the year following initial implementation by an average of 20%. IS maturity had a major influence on support cost for the year following initial implementation. Organisations with low IS maturity experienced an increase in support cost whereas IS mature organisations experienced a decrease in costs. This disparity can be traced, in part, to the widely varying maturity of pre-ERP environments. Lack of regional standardization and low budget for IT within Kenya and other African nations makes it difficult for ERP companies to find markets with enough potential to justify investing in costly customisations of the products.

Consultants also noted that benefits of an ERP application are limited unless it is seamlessly integrated with other information systems. Organisations face many challenges relating to ERP integration – (1) the challenges of integrating various functional ERP modules, (2) the challenge of integration with other e-business software applications, (3) the challenge of integration with legacy systems. Integration further escalate the cost of implementing ERP systems. Organisations noted that legacy systems have accumulated vast amount of data vital to the survival and operations. Integration of ERP systems with legacy systems is more complex than the integration of ERP modules and Integration of e-business applications. It routinely requires the installation of third-party interface software for communication between ERP software systems and legacy systems. Second generation ERP systems use relational database management system (RDBMS) to store enterprise data. Data conversion from legacy systems to RDBMS is often a time-consuming and tedious process.

Integration of the business processes also faced additional challenges related to new rules built into ERP software being incompatible with the established ways of thinking and the norms of behaviour embedded in the existing work routines. This is consistent with the idea of 'best practice' being situated. Assistant Purchasing in one of the organisations while explaining that ERP could not accommodate their work practice said that:

> Given our unique requirement, Ebizframe could not meet our need. The system could not accept advance payments. It required us to raise DN [Delivery Note] first then raise sales invoice and they receive payment against the invoice. We don't work that way.

Factor 2, named "Lack of IT skills by users and high staff turnover" comprises four items relating to lack of capacity to cope with ERP on the part of all organizational members at all levels due to the inadequate time for training and high staff turnover: lack of IT skills among users, inadequate training time, high staff turnover, and inadequate preparation by employees.

An all common complaint was the frequency with which the case study organisations lose key personnel experienced with ERP or supporting technologies. Frequently reported problems were: (1) losing key IT specialists and user representatives working on the project while the project was going on, often despite handsome retention bonuses, (2) losing experienced people after the project was complete. Many IT specialists thrive on project work and view assignment as a 'competence centre' and springboard to lucrative opportunities.

One of the major challenges facing ERP systems implementation in Kenya is the non-existence of well-qualified employees in implementing organisations to manage the implementation process of the system. In one of the case organisations, the ERP project was supervised by the financial controller (the ERP Project Manager) and the heads of administrations (the key users). None of them had any knowledge about the computer or the ERP software. The organisations use India and South Africa as resource base for implementation. The MIS General Manager said:

> All of the company's leaders were not qualified to use the computer…They only trained on the beginnings of Windows and DOS…Training was internal in finance department for one week. One week was not enough. It was just background information.

Consultant noted that most of the employees in the implementing organisations are unprepared for the changes resulting from ERP implementation. Implementing an ERP will bring in changes to the way people work within the organization, processes will change and there may be job cuts and rationalization of responsibilities within departments. All this will definitely evoke resistance from the employees and this has to be managed effectively before, during and after the implementation of the ERP package. Consultants noted that employees are often inadequately prepared for the major undertaking of ERP

implementation. Most respondents noted that they were neither aware of the reasons for the implementation nor the business benefits that can be expected by implementing a new ERP package. ERP projects are therefore perceived as cost cutting measure by organisations which lead to mass staff layout. Consultants noted that there was no strong change management team in place to oversee to approve, implement and track the changes in the organization, which includes the impact and detailed structure (i.e. documentation) associated with the life cycle of the ERP project.

Factor 3, named "Poor ICT infrastructure and ICT policies" comprises two items relating to government policy on ICT and the state of ICT infrastructure in the country: poor ICT infrastrucre and government policy on ICT.

Consultants noted that poor telecommunications, internet and intranet, and mobile coverage affect ERP adoption and use in Kenya. Organisations in Kenya face obstacles related to Kenya's poor telecommunication infrastructure in getting the ERP systems up and running. Organisations operating nationally, regionally, and internationally must incur additional costs in providing communication backbone. Consultant noted that most organisation do not trust the reliability of local telecommunications and thus are forced to install alternative telecommunication means, the most common being Very Small Aperture Networks (VSAT). This is expensive by Kenyan standards, but this is the only way to go about it. However, the drawback with the VSAT system as mentioned by the IT manager at a consultant is that "it would support only batch data transfer (via FTP), which caused significant delays…up to one-and-a-half seconds per keystroke…that is not acceptable for online transactions".

Even with current networks communication is quite slow. Two main aspects of ERP system by infrastructure are the system availability and speed as commented by a consultant at PricewaterhouseCoopers "The system cannot run full month without breaking" and when the system is available it is likely to be slow.

A consultant noted that a company was forced to completely abandon implementing web-portal in their ERP due to lack of internet connectivity in Muhoroni (town in remote location in Western Kenya). The cost of setting up a private using VSAT was exorbitant for the company to afford. Poor internet connectivity is also hindrance to complete value chain management and customer relationship management.

The poor ICT infrastructure in Kenya according to consultants is because the Kenyan government exerts excessive control over the national communications operator. The government often operates national communications directly through Telkom and Coomunications Commission of Kenya (CCK), largely because the private sector is often incapable operating such an infrastructure. There is hope that things that ICT infrastructure will improve once Telkom is privitised early next year, 2009. Although there has been a move towards deregulation and privatization of Telkom, the process is still slow and had often been opposed by government telecommunication ministries national security forces.

In combination with inefficient state-run telecommunications, another major impediment to ICTs in Kenya come from the onerous tariff structure. It works out that the average telecommunications revenue per subscriber line in Kenya is twice as much in Europe, and four to six times as much as in USA.

Cronbach alpha coefficients were calculated to test the reliability of these challenges, as shown in the last row of Table 2. The reliability of coefficients obtained ranges from 0.67 (factor 3) to 0.83 (factor 1). Srinivasan (1985) proposed that a coefficient of 0.7 or higher is acceptable, while a coefficient of 0.5 or higher is considered sufficient when dealing with exploratory research combined with unvalidated data. Thus, the reliability coefficients in this study are deemed acceptable. The strength of factor analysis is that it provides a basis for data reduction. Therefore rather than looking at all ten items, just three factors can be examined. That simplifies the rankings and clarifies the most important items. Rather than focusing on individual items, practitioners and researchers can focus on the broad set of items represented by the essential factors.

4 CONCLUSIONS

All factors – ten – were .rated as critical (rating > 4). The findings of this study supports Huang and Palvia's (2001) view that ERP projects faces additional challenges in developing countries related to economic, cultural and basic infrastructure issues. In fact, ERP implementations in Kenyan organizations face some unique challenges some of which are summarised below:

- Costs of the system are high for many companies thus putting off many potential buyers of the systems.
- Inadequacy in resources e.g. funds thus delaying the implementation process.
- Poor IT skills among users of the system in the companies.
- Poor change management among implementing companies with users not ready for change and minimal management support in the systems implementation process.
- Poor ICT infrastructure especially lack of adequate network coverage nationally
- Inadequate training time allocated to ERPs implementation. Companies always in a rush to see the project completed without due respect to work that has to be done.
- Data migration from existing systems very involving, some times incompatible with the new systems

The conflict, caused by the implementation of ERP systems in developing countries, between the globalization and localization of management work practices is worth of further investigations. However, this conflict is not a unique phenomenon to developing countries.

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