Current Prospects and Challenges of Enterprise Resource Planning (ERP) Adoption in Developing countries

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Abstract

Enterprise Resource Planning (ERP) is an enterprise system that helps organizations to integrate their functional areas such as finance, human resources, accounting etc. It improves transparency, productivity and communications in organizations. It also improves the flow of information between departments. ERP has originally been developed with the best practices of large organizations, however Small and Medium Enterprises (SMEs) are also implementing ERP in order to remain competitive. Furthermore, ERP is not only implemented in developed countries where it originated, organizations in regions such as Africa and Asia are also implementing ERP. Considering the fact that ERP systems were developed in first world countries, their in-built processes are compatible with organizational structures of those countries. But ERP has taken over the whole world. Due to the differences on how organizations operate, organizations from other regions experience challenges when implementing ERP. This study explored the adoption of ERP implementation in developing countries, focusing on challenges and risks that they face. The study has found unreliable vendors, lack of skilled human resources, misfits between the ERP system's built-in processes and the companies' business processes as the main challenges.

Keywords: Enterprise Resource planning, Developing Countries, Adoption, Implementation.

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1 Introduction

Enterprise Resource Planning (ERP) systems provide an integrated solution for organizations, providing all sorts of benefits such as: unifying different departments into one system and allowing complete visibility into all business processes (Amoako-Gyampah, 2007).

In comparison to developed countries, the rate at which companies are adopting ERP in developing countries is low. One of the apparent reasons is the difference in wealth between developing and developed countries, given the fact that ERP systems are very costly (Hawari & Heeks, 2010).

However the significant differences is proof that reasons go beyond costs. Brehm, Heinzl & Markus (2001) have identified the differences in the alignment between organizational requirements and ERP as one of the problems that is faced worldwide, as internal processes are not universal (Brehm, Heinzl, & Markus, 2001). Similarly, there is also a vast difference in the economic development between organizations in different countries. This also contributes to disparity in adoption.

Seventy percent of ERP implementation in developing countries did not deliver the expected benefits due to different legal and government regulations (Dezdar & Ainin, 2011). ERP systems delivered in one context cannot be universal, hence misfits would be experienced in other contexts (Dezdar & Ainin, 2011).

According to a case study by Hawari & Heeks (2010), there are usually assumptions before the designing of the system that, there are broadband internet connection existence as well as stable local area networks in every country which is not always the case. The stage in which developed countries are, is not the same as it is for developing countries. The same study also found that due to the fact that ERP systems were designed for large organizations, the business practices have considered and reflect the organizational and national cultures in these countries. Therefore problems and misfits are likely to happen when this same systems are implemented in Africa and other continents (Hawari & Heeks, 2010).

This paper seeks to explore the adoption of ERP in developing countries, looking at the factors leading to the adoption, the challenges and the limitations of ERP adoption.

2 Reasons for implementing ERP

A study of ERP adoption in South Africa has found that organizations have adopted ERP for the following reasons (Mushavhanamadi & Mbohwa, 2013):

1. Pressure from customers and suppliers
2. Technological pressure
3. To cope with the future needs

3 Success factors

Many studies have looked at success factors that need to be considered for the success of ERP projects in developing countries. Dwivedi et al. (2013) for example have looked at the success factors in an Indian context. The study has found cost as the most critical factor that needs to be considered at the start of the project. The study illustrated the importance of cost benefit analysis in order to determine the project viability. It also found training and education as an important factor for end users, since ERP is less known in developing countries. Top Management support and vendor selection are also deemed important success factors, since it is important for decision makers to understand the importance of providing necessary resources during ERP implementation as well as selecting the right vendor that will be able to align business processes with the ERP system.

In addition to factors identified by Dwidedi et al. (2013), Basu et al. (2012) found proper project management, clearly defined goals, change management and effective communication as factors that can help ERP projects to succeed.

Another Indian study also looked at success factors. This study have examined factors to determine which ones have more weight than the others. They have found the following factors: A clear business plan and vision, Project management, Top management support, good vendor selection, good communication, effective team work, efficient change management culture, and monitoring and evaluation of performance (Dwivedi et al., 2013). It should however be noted that, India has advanced IT expertise in comparison to other African countries (Chakrabarti & Ghosh, 2014).

Similarly, Gupta, Aye, Rajagopal & Nguwi (2014) have also found further critical success factors. They have divided them in three different categories. The first category consists of managerial factors. These include: Risk Management, Organization culture, a good business vision, Change management, and Top management support.

Under the technical category, they have found: a good system documentation to help companies after implementation, consideration of legacy system, the possibility of having them integrated with ERP. Another technical success factor such as user involvement in the ERP project, training of users in order for them to be interested in using the system; empowering attitude among management and decision makers.

Deshmukh, Thambi & Kalamkar (2014) have also found several successful factors in their study for implementing ERP in India. They have found Education, Top Management commitment, right skilled people for the job and availability of adequate IT infrastructure (Deshmukh, Thampi, & Kalamkar, 2015).

A similar study in China looked at determinants and success factors of ERP systems implementation (Zhang, Lee, Zhang, & Cheung, 2005). They have found the following success factors:

1. Effective project management: that is able to plan and coordinate complex projects and making sure that budgets are not overrun, and that implementation process is complete and within schedule.
2. Business reengineering process: the space and willingness to re-engineer the organizational business processes in order to accommodate ERP.
3. Support of Top management: to be available in providing support during and after implementation whenever needed, and to be open to allowing necessary changes to take place whenever necessary.

Table 1 shows the summary of factors found to be of importance for the success of ERP implementation in developing countries.

4 Challenges

Mukwasi & Semour (2015) found lack of vendor transparency that led to the necessity of customization and maintenance costs which were not communicated in advance. Poor evaluation of ERP in the acquisition phase which results in choosing a wrong ERP package. The study also found lack of consultation skills and insufficient internal expertise (Mukwasi & Seymour, 2015).

Inadequate user internal communication between management and end users is also another challenges that lead to dissatisfaction with the system (Abdellatif, 2014). Inadequate IT infrastructure, lack of ERP experience and governmental policies that are not compatible with ERP requirements all contribute to the high failure rate in developing countries. Rajapakse (2012) found lack of timely decision making among management and reluctance to change.

Another Kenyan study Otieno (2008) also found many challenges that are related to ERP integration. The study found that companies in Kenya are experiencing challenges with

Table 1: Summary of factors for the success of ERP implementation

Success Factor	Author
Cost benefit analysis	(Dwivedi et al., 2013); (Otieno, 2008)
Training and education	(Dwivedi et al., 2013)
Top Management support	(Dwivedi et al., 2013); (Deshmukh et al., 2015)
Selecting the right vendor	(Dwivedi et al., 2013); (Deshmukh et al., 2015); (Gupta, Seetharaman, & Raj, 2013);
Effective Project Management	(Basu, Upadhyay, Das, & Dan, 2012)
Defined goals	(Basu et al., 2012)
Effective communication between vendors and employees	(Basu et al., 2012)
Risk Management	(Gupta et al., 2013); (Rajapakse & Seddon, 2005); (Rajapakse & Seddon, 2005)
Change Management	(Gupta et al., 2013)
Good system documentation	(Gupta et al., 2013)
Consideration of Legacy systems	(Gupta et al., 2013)
User Involvement	(Gupta et al., 2013)
Willingness to reengineer organizational business processes	(Gupta et al., 2013); (Shahawai & Idrus, 2009); (Shahawai & Idrus, 2009);(Zhang et al., 2005); (Saleh, Abbad, & Al-Sherih, 2013); (Saleh et al., 2013)
Right skilled people	(Deshmukh et al., 2015)
Adequate IT infrastructure	(Deshmukh et al., 2015)
Monitoring & Evaluation of Performance	(Dwivedi et al., 2013)

integrating ERP systems with their legacy systems. Another challenge the study found is associated with high costs that result from customization given the fact that the systems are not 100% satisfactory as is. Customization often becomes necessary, which is a very long process that is regarded to be very costly (Otieno, 2008).

The same study found poor change management such as inadequate preparation of employees and necessary organizations changes as another challenge of ERP implementations in Kenyan organizations (Otieno, 2008). Another challenge found in this study is the vendors' unreliability, where by vendors seem to lack adequate knowledge about ERP and also lack of confidence with their knowledge.

Shahawai & Idrus (2009) also looked at issues that affect the ERP adoption in Malaysia. The issues experienced include: incompatibility with the company needs, difficulties in corporating ERP system within their business processes. The same study has also identified success factors that can help to avoid problems after implementation. This includes being cautious and not ignoring the necessity of transforming the work culture in order to make

it fit for ERP.

Abdellatif (2014) has looked at challenges and risks involved when implementing ERP in developing countries. It has identified the following risks:

- Poor organizational infrastructure
- Resistance by employees to use the system
- Low organizational IT Maturity
- High costs involved in ERP implementation.

Based on the fact that an ERP system was originally designed for European organizations, other companies especially in developing countries suffer (Rajan & Baral, 2015). In addition, there are usually a lot of misfits experienced when it comes to implementation in other countries such as the developing countries. There are several studies that have proved failure due to this. One such study have investigated how a Chinese company has implemented ERP, and only realized later that the system context did not fit their Chinese context (Avison & Malaurent, 2007). The users had to work around the misfits by incorporating their own solutions. Such solutions included working around calculations such as the local tax calculations which were done differently from what was provided in the system. In the end they had to calculate these manually and load the results manually.

Another challenge included lack of functionality to allow Chinese to give gifts, which is a tradition known to develop strong friendships in business. However in this case, another work around was developed by the Chinese to allow additional expenses to be added, but to be approved by management.

This success was reached due to a number of factors:

- A positive management attitude that allowed management to be open to listening to the changes that could be made.
- Being flexible also work out in their favor
- A good communication among users led to a successful discussion of possible outcomes that ended up being implemented.

Huang & Palvia (2001) have identified five categories that affect the ERP implementation namely: economic growth of a nation, a company's infrastructure, the level of IT maturity

of an organization the company culture of computers, the size of the business, as well as the government regulations.

A study in China has identified that ERP vendors play a critical role in ERP adoption. The study found that there are no professional local ERP vendors, and the international vendors have only opened up their business in big cities. In addition, these ERP systems are usually costly (Huang & Palvia, 2001).This has been supported by a study in Saudi Arabia, which stated that usually ERP vendors are foreigners and therefore, the ERP vendor support is not guaranteed. Organizations are often not keen to buy a product whose support such as technical assistance and service reliability is not guaranteed.

Another problem found to affect the ERP, adoption is the misalignment between what the ERP offers and the business processes of an organization (Saleh et al., 2013). Due to the fact that there systems are designed according to western countries, organizations usually should be willing to change the business processes in order to accommodate the ERP system (Saleh et al., 2013). Due to these misalignment there are many cases of ERP failures in such organizations (Hawari & Heeks, 2010).

Table 2 shows a summary of challenges and failure factors when implementation ERP in developing countries.

Table 2: Summary of challenges and failure factors of ERP implementation

Challenges and failure factors	Author
Incompatibility with company needs (Misfits)	(Shahawai & Idrus, 2009); (Abdellatif, 2014)
Difficulties in integrating ERP system with business processes	(Shahawai & Idrus, 2009); (Otieno, 2008)
Poor organizational Culture	(Abdellatif, 2014)
Employees Resistance	(Abdellatif, 2014)
Low IT maturity	(Abdellatif, 2014)
High Costs	(Abdellatif, 2014); (Huang & Palvia, 2001)
The late involvement of users in the ERP project	(Otieno, 2008); (Shahawai & Idrus, 2009); (Deshmukh et al., 2015)
Lack of effective communication between developers and the users	(Shan, Khan, Bokhari, & Raza, 2011)
Lack of willingness by users to use ERP	(Abdellatif, 2014)
Lack of user acceptance of the ERP system	(Abdellatif, 2014)
Lack of experience and knowledge by vendors, which often lead to project overruns	(Abdellatif, 2014); (Otieno, 2008); (Huang & Palvia, 2001); (Huang & Palvia, 2001)

5 Risks

A study by Aranchi, Chong and Lakshanth (2015) looked at the risks involved in implementing ERP. One such risk is inadequate knowledge in the continent that is required to maintain an ERP System. Another risk involves hiring an external consultant who may not fully understand the business culture and policies. Resistance to change is also another risk identified by the study, referring to users unwilling to use the new system but to rather stick to legacy systems.

Shan, Khan, Bokhari, & Raza (2011) carried out a similar study. They have found the following risks:

- Turnover of vendor team members that have overseen the implementation
- Turnover of top management

The same study also looked at failure factors and have identified the following:

- Lack of effective communication between developers and the users.
- Lack of willingness by users to use ERP.
- Lack of user acceptance of the ERP system.
- Vendors not fully understanding the complex business.
- Lack of experience and knowledge by vendors, which often lead to project overruns.

Table 3 shows a summary of risks that come with implementing ERP in developing countries.

6 Discussion

The study investigated the ERP implementation in developing countries from different angles. It has looked at factors that lead to the success of the ERP project, as well as those that contribute to the failure of projects. The study also looked into challenges and risks of implementing ERP in developing countries.

Table 3: Summary of risks of ERP implementation

Risks	Authors
Poor evaluation of ERP	(Mukwasi & Seymour, 2015)
Lack of consultancy skills	(Mathara, Chong, & Lakshanthi, 2015); (Abdellatif, 2014)
Insufficient internal expertise	(Mukwasi & Seymour, 2015);(Otieno, 2008)
Inadequate user internal communication	(Abdellatif, 2014)
Inadequate IT infrastructure	(Abdellatif, 2014)
Governmental policies that are not compatible with ERP requirements	(Huang & Palvia, 2001)
High costs that result from customization	(Abdellatif, 2014)
Poor change management	(Dwivedi et al., 2013), (Basu et al., 2012)
Vendors' unreliability and lack of knowledge	(Deshmukh et al., 2015);(Gupta et al., 2013); (Mukwasi & Seymour, 2015)
Turnover of vendor team members that have overseen the implementation	(Shan et al., 2011)
Turnover of top management	(Shan et al., 2011)

It is evident that many organizations have similar experiences. Many studies have identified similar factors. For example regarding success factors, there are common factors that are found to lead to the success of ERP implementation. There are the factors: Top Management support, effective communication, change management, user involvement and vendors' adequate knowledge.

These factors are however not unique to developing countries, because for a project to succeed regardless of the location, it is crucial to have the support of management, in order for them to be open to give or recommend any support needed to make it succeed.

But there are many discovered factors that are unique to developing countries. For example, IT Maturity of an organization, computer culture, economic growth, good IT Infrastructure. Maturity of IT is not common in developing countries, and the culture of using computers are not obvious. The IT Infrastructure is also not well developed in many developing countries. For example, there are several studies that have identified poor telecommunication and network infrastructure, and the internet is not stable. These are some of the factors that affect the efficiency and the success of ERP implementation.

Based on the fact that ERP systems are very expensive, a stable economy is also a necessity. ERP implementation comes with high operational costs as well as implementation and post implementation costs such as upgrades and maintenance.

The study has reported many challenges. The common challenges revolve around misfits

that are caused by the differences in business operations between developed countries and developing countries. This has been experienced almost in all organizations. One organization has gone as far as doing their own work-arounds, using spreadsheets to do their own calculations which were not catered for, and then uploading those into the system. One would wonder whether this does not defeat the purpose of the system, which was bought to integrate all the operations into one system.

But it is evident that, it is crucial for the developers to understand the needs of companies in other organizations in other countries if they plan to extend their systems to those countries.

Many companies have also experienced lack of vendor knowledge. For example, Otieno (2008) and Mukwasi & Semour (2015) both found lack of transparency and lack of knowledge about ERP by the vendor. This could be a result of the fact that, many of the vendors are based in western countries, and they usually partner up with companies in developing countries to do the implementation. However, the consultants in these countries do not have the necessary knowledge, especially to customize systems according to organizations' business processes.

Several studies have also found that many organizations do not involve users and give them adequate preparation that they need in order to be ready to accept a new system. For example Rajapske (2012) and Otieno (2008) both found that, users are usually hesitant to use the system and they lack adequate knowledge and they also do not have enough confidence to use the system.

It is also found that, due to poor evaluation of ERP by organizations, wrong ERPs are often chosen that are not appropriate. What could also contribute to this is lack of choices to choose from, as well as lack of internal experience in organizations as found by Mukwasi & Semour (2015).

Several studies have also found lack of internal expertise as a serious problem. It seems that this is also depended on the support from management. If they are supportive, then they are likely to support and pay for training to a number of employees to be able to use the system. Several studies such as Deshmukh & Tampi (2014); Shahawai& Idrus (2009) and Otieno (2008) have also identified inadequate preparation of employees prior to using the system.

The study has also identified several risks of implementing ERP. For example, the turnover of vendor team members during the project is one of the common identified risks. This is however a general risk and does not only take place in developing countries. It would probably be ideal for an organization to sign a contract with the vendor to have the participating team members see the project through until the end.

Considering that many of these ERP organizations are developed in western countries and their cultures and norms differ greatly from other organizations in other countries such as in Asia and Africa. It is very important for these organizations to understand how businesses are done in these countries, for example how several calculations are done etc. Because it has been found that there are many failure cases taking place due to misfits in organizations.

There are also cases reported of vendors misleading organizations about different capabilities that are not necessarily possible, and this leads to organizations selecting wrong packages. It would be recommended that organizations hire experts who understand ERP, in order to avoid spending money on systems that are not satisfactory.

7 Conclusion

We have presented an investigation of ERP implementation in developing countries. It has looked at, success factors, failure factors and risks. It was identified that many organizations in these countries face the same challenges and risks.

Most of the organizations have adopted ERP due to competitive advantage, as well as to manage their businesses efficiently. It is however challenging as these systems were not designed with universal business processes, hence many organizations find themselves having to spend more money to customize them.

Low maturity of IT organizations and poor IT infrastructures are some of the challenges faced by organizations in developing countries, as well as unreliable vendors. They also face challenges of misfits. It is crucial that when developers develop ERP systems that they plan to deploy in other countries, they should also get to understand the cultures, norms and government policies in the prospective countries. It is also advisable that they leave room for easy customization, especially regarding calculation capabilities so that it is possible for countries to adjust these options. There are still a vast difference between technological advancement between developed countries and less developed countries that need to be considered when developing ERP systems. In addition, developing countries also need to invest in educating their own software engineers so that they too will be able to develop ERP systems.

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