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An Investigation of Factors Leading to the Reluctance of SaaS ERP Adoption in Namibian SMEs

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ABSTRACT

This paper aims to contribute to the growing study of Cloud ERP in small and medium enterprises (SMEs). A qualitative study was done in Namibian SMEs to investigate factors that lead to the reluctance of Cloud ERP in SMEs in developing countries. Data was collected from fourteen different SMEs. A Diffusion of Innovation (DoI) framework was chosen to understand how this relatively new technology is being adopted. The study has found attitude towards change, satisfaction with the existing system, lack of knowledge, compatibility issues, unreliable internet connectivity and data security concerns as the main factors that lead to this reluctance. Furthermore, it has also found that perceived low cost has a positive effect on the intention to adopt cloud ERP. The study concludes that the presence of Cloud ERP providers will encourage Cloud ERP adoption, as there seems to be lack of knowledge among prospective adopters. In addition, with unreliable internet connectivity concerns, these providers can consider partnering up with internet service providers to provide affordable reliable internet services

Keywords

Cloud ERP, Small and Medium sized enterprises, Enterprise resource planning, SMEs, Diffusion of Innovation

INTRODUCTION

Many organizations seeking to minimize costs and maximize efficiency are adopting on-demand Enterprise Resource Planning (ERP) systems to gain competitive advantage. Traditionally, ERPs were only feasible for large enterprises, however ERP vendors are now directing their attention to designing

affordable solutions for small and medium sized Enterprises (SMEs). For example, one growing ERP provisioning approach is a demand-oriented service model, where services are provided through the cloud. This approach, known as Cloud ERP in literature, enables ERP vendors to provide applications over the Internet, so that customers subscribe and pay according to their use. Thus, the cloud ERP approach becomes an attractive alternative for SMEs, as it by eliminating the need for investing in expensive IT infrastructures and also eliminates other ERP implementation challenges.

SMEs are considered to be the economic backbone of many emerging and developing countries such as Namibia (Mukaila Ayanda and Sidikat Laraba, 2011). As such, it is important for these companies to improve their productivity, by increasing their competitive advantage. SMEs are, however, characterized by inadequate physical, human, technical and financial resources (Pitic, L., Popescu and Pitic, D., 2014), which can make the process of ERP implementation in these companies costly and unfeasible. With the introduction of cloud ERP, however, small businesses have the opportunity to take advantage of low cost systems that offer the same capabilities as on-premise ERPs.

Despite the reported benefits such as low upfront and implementation costs that come with the adoption of Cloud ERP, there is however a perceived reluctance in its adoption by some SMEs (Faasen, Seymour and Schuler, 2013). This is perhaps due to the fact that many small organizations that implemented ERPs failed to successfully realize the desired benefits. Ahmad and Cuenca (2013), for example, reported that most enterprises implementing ERPs do not realize the expected benefits from such implementations, which could discourage SMEs from pursuing such systems. For the organizations that did implement ERPs, they observed that the organizations did not fully capitalize on the business intelligence provided by these systems (Ahmad and Pinedo Cuenca, 2013). Their study was however restricted to understanding only the Western Macedonia region's perceptions of SMEs; its relevance to developing contexts such as the Namibian SME industry has not been verified. Therefore, there is a need to investigate and identify the factors causing this reluctance and resulting delayed adoption by SMEs in these contexts.

One of the frameworks, widely used to study how a new innovation is adopted in the context of implementation, is the Diffusion of Innovation (DoI) framework (Rogers, 1995). Rogers developed the DoI framework during his research to understand why farmers in Iowa delayed adopting new, and beneficial, innovations. The DoI framework explains the processes that take place from the time when an innovation is introduced, to an individual, to the time that it is either adopted or rejected by the community. Rogers (1995) observed that while only a few people are willing to adopt a new innovation in its infancy, other people start adopting to it over time. This model is today, widely adopted as a meaningful method to study how a technology innovation penetrates the market (Oliveira and Martins, 2011). Against this background, the DoI theory was thus deemed suitable to evaluate the Cloud ERP adoption in this study.

This study aims to answer the following questions:

What are the factors that hinder Namibian SMEs from implementing Cloud ERP?

The study, therefore, seeks to discover the general perception of cloud ERP by Namibian SMEs, and to identify factors that hinder them from adopting Cloud ERPs.

The rest of the paper is structured as follows: Section 2 presents the literature review, Section 3 presents the research methodology, Section 4 presents the findings, Section 5 presents the discussion, and Section 6 concludes the paper.

BACKGROUND AND RELATED RESEARCH

Cloud Computing services in Africa

Cloud computing is a relatively new concept in Africa. According to Mohlameane and Ruxwana (2014), limited knowledge and understanding of cloud computing are some of the major factors that have slowed its adoption in Africa. In comparison to other countries such as the US and the EU, which moved some of their government applications to the cloud (Mauro, 2012), it is evident that there is a gap in the cloud computing adoption between Africa and the rest of the world.

Although there might be a myriad of factors causing the slow adoption of cloud ERPs, the unavailability of broadband networks is believed to be one of the major factors affecting the adoption of cloud computing in Africa (Lechesa, Seymour and Schuler, 2012). Recently, Botswana and Namibia have each invested US\$38.7 million towards a West Africa Cable System (WACS) that promises a much cheaper and reliable Internet connectivity in both countries. With this development, one would expect these countries to take advantage of cost efficient cloud computing services (Gupta, Seetharaman and Raj, 2013).

Overall, cloud computing is slowly being adopted in several African countries. Several organizations in the region are also adopting cloud computing, and according to the International Data Corporation (IDC), this trend is likely to grow at an annual growth rate of 84% in the next five years (IDC, 2014).

Cloud ERP

Enterprise Resource Planning (ERP) on the cloud, also known as ERP SaaS, refers to an ERP system offered over the Internet and accessed via the web browser (Lenart, 2011). SAPbyDesign and NetSuite are good examples of Cloud ERP. It is ideal for an enterprise that is just starting its operations or an enterprise that is starting a new division and do not want to invest in new IT infrastructure (Lenart, 2011).

The implementation of cloud ERP involves different parties: the company that provides the cloud ERP service, e.g. SAP; the company that provides the cloud environment (sometimes this can also be the same as the ERP service provider); the company that provides the support; and the company for which the system is being implemented (Purohit and Jaiswal, 2012).

Preliminary research on Cloud ERP has shown that, in comparison to On-premise ERP, Cloud ERP reduces licensing costs, implementation costs, and total cost ownership (Lewandowski, Salako and Garcia-Perez, 2013). It also results in a short implementation process, a reduction in IT personnel, scalability and provides automatic upgrades (Chandrakumar and Parthasarathy, 2014). Cloud ERP offers low monthly subscription fees and it is easier to understand (Tarantilis, Kiranoudis and Theodorakopoulos, 2008). In addition, Cloud ERP provides advanced backup plans, and data recovery plans, which on premise ERPs do not offer (Newton and Longwell, 2012).

A study by Gupta, et al. (2013), found the main factors that influence small and medium enterprises (SMEs) toward adopting cloud computing are security assurance and ease of use (Gupta, Seetharaman and Raj, 2013). The study also found that saving costs is not a priority; however, operational economy is an important contributing factor for SMEs moving to the cloud.

Lechesa et al. (2012) found network limitations, customization limitations and concerns over security as the main barriers affecting ERP SaaS adoption in South Africa. On the other hand, Faasen et al. (2013) found factors relating to available quality assurance, lack of trust in vendors, and satisfaction with existing systems as some of the reasons that negatively affect the SaaS ERP adoption in South African SMEs. Lewandowski (2013) found potential user fears of being unable to customize the applications, concerns regarding technical performance, and questions of integration with other systems, as well as security concerns, as the challenge sets affecting potential ERP SaaS adoption.

Al-Johani and Yousef (2013) did a comparative study of ERP systems before and after moving to the cloud. They found that costs can be reduced by 50% after SMEs adopted cloud computing, and burdensome tasks, such as daily data backups, can be eliminated (Al-Johani and Youssef, 2013). The study has also shown that cloud ERP eliminates the need for hiring IT teams for system maintenance.

Empirical research on Cloud ERP adoption in the African regions is still very limited, and the majority of the available research was carried out in large organizations. This initial research aims to contribute to the present scarce research, and to explore reasons leading to the reluctance of cloud computing in Namibia, focusing on SMEs.

Rogers's Diffusion of Innovation (DOI)

DoI is a theory that looks at how a new technology spreads from creation to its use, at a firm or the individual level (Rogers, 1995). The study divided the technology adopters into five advancing segments: innovators, early adopters, early majority, late majority and laggards. According to the model, the technology diffusion passes through the following phases: first, the knowledge phase, in which the technology's existence comes to be known; Persuasion, which refers to individuals developing a positive attitude towards the technology; Decision, which indicates a commitment to the technology adoption and implementation; and Confirmation, which reinforces the technology decision, due to its expected delivery of gains and positive outcomes.

In addition, Rogers (1995) has proposed five characteristics that influence the adoption of a new innovation: Relative Advantage, refers to the degree the benefits of the technology are perceived to the organization in comparison to existing processes; Compatibility indicates whether the new technology is consistent with existing positive experiences; Complexity addresses the ERP technology's perceived usability ease; Trialability, focuses on the extent to which the technology can be tested before buying; and Observability, indicates the need to observe visible results.

This research will use the DoI theory to understand the degree to which Namibian companies are willing to adopt or not to adopt SaaS ERP. The DoI theory has proved to be a successful theory in explaining how new information systems innovations are adopted (Bradford and Florin, 2003; Zhu et al., 2006),

RESEARCH METHODOLOGY

In order to obtain sufficient details and descriptive data, qualitative research was used in this study. Qualitative data can be richer than quantitative data, as it increases the information details that is obtained in the collected data (Seaman, 1999). It is also known to be appropriate for information

systems studies, because it brings managerial and organizational issues to light (Seaman, 2008).

We acknowledge that the qualitative study cannot be generalized over a population. The findings in this study are related only to the specific cases and all generalizations are theoretical (Lee and Baskerville, 2003), i.e. they generalize specific observations to theoretical concepts. With these concepts we can explain the events in the organizations studied, and we also strongly believe that these findings are similar in other like contexts.

Data collection

The initial research aim was to identify factors that led to the implementation of Cloud ERP in SMEs. However after doing a preliminary background, we discovered that Cloud ERP was not commonly adopted in SMEs. It is against this review of published literature that the research direction was changed to explore reasons of reluctance to implement Cloud ERP in Namibian SMEs.

Our focus on factors that lead to the reluctance of adopting a new technology required input from decision makers in the organizations. This research was conducted through face to face interviews in Namibian SMEs. The sample was purposely selected from the Namibian Ministry of Trade and Industry SME Register to include a mix of SMEs that have adopted as well as those that have not yet implemented any form of an ERP. One of the researchers contacted a few organizations, and successfully found sixteen SME companies willing to participate in the study. Each interview took an average of about 40 minutes. The interview questions allowed the interviewees to give as much information as possible. Twenty face-to-face interviews were conducted in the sixteen companies, of which fifteen took place in companies that have implemented On-premise ERP, and five in companies that have not implemented any ERPs. The reason for the variation was to see whether there is any difference in the perception between those that already have an existing ERP system and those without. We have used the EU definition of an SME, which categorizes companies with up to 250 employees as SMEs (European Commission, 2005). The participants ranged from CEOs, IT Managers to System Analysts as shown in Table 1. The interviews were recorded using a digital recorder. Some of the respondents quotes were selected to be included in the study results.

Data analysis

A software tool Atlas.ti was used to analyze the data. The data were coded in order to identify rich meanings within the interviews. Similar codes were then grouped into categories. For example, from this quote “*What would happen if I am busy working on the system and then I lose the connection for example or the power goes off*”, we have deduced codes “*connectivity issues*” and “*fear of work interruption*”. Then we categorized these codes based on the diffusion of innovation categories: individual characteristics, organizational characteristics and innovation characteristics. For example, we have categorized “*attitude towards change*” and “*lack of knowledge*” under individual characteristics, because these codes are concerned with individuals.

Participants	Role	Company size	ERP Implemented
1	Manager: Systems & software	120	Yes
2	IT Director	245	Yes
3	Acting ERP Manager	200	Yes
4	Owner	25	No
5	ICT Manager	90	Yes
6	Senior Business Analyst	178	Yes
7	CEO	60	Yes
8	IT Manager	50	No
9	CEO	7	No
10	IT Manager	18	Yes
11	Software Development Head	150	Yes
12	Owner	10	No
13	Operational Manager	200	Yes
14	CEO	65	No
15	IT Manager	140	Yes
16	Accountant		
17	General Manager		
18	Business Analyst	75	Yes
19	Manager: Systems		
20	Financial Officer		

Table 1. List of interviewees

FINDINGS

Attitude towards change

Uncertainty and risks play a role in the adoption of new technology. Companies become reluctant to adopt a technology when they feel uncertain or unsure. Given the fact that cloud computing is a relative new concept in Namibia, organizations are reluctant to adopt the technology due to lack of trust and insufficient vendors. However, there are several interviewees that showed some level of willingness to adopt it. Participant 4 and Participant 8 have stated that they would consider adopting it for its low cost, flexibility, and rapid implementation.

Below are excerpts from the survey results:

“It is very convenient because it removes the need for installations. You also do not need a very fast computer with a big hard drive since it is already considered on the cloud server.” (Participant 4)

The rest of the participants, however, seemed to have a negative attitude towards cloud computing in general.

“I would like to have my own data and have full control of who sees it.” (Participant 3)

Participant 2 shared the same sentiments: “Cloud computing is relatively new in the Namibian market, it is always risky to be the first to explore a new technology.” (Participant 2)

Based on this observation we have formulated our first hypothesis.

Hypothesis One

Uncertainty about Cloud ERP leads to a negative attitude towards it, which undermines the decision to adopt it.

Individual characteristics

According to Roger’s theory, individual characteristics refer to the personalities of people among whom the spread will occur, or people that have an effect on the decision to adopt a technology. For this study we have found attitude towards change, satisfaction with existing system, and lack of knowledge as the characteristics of prospective adopters.

Lack of Knowledge

Companies that have not implemented ERP before all shared similar sentiments regarding knowledge. All five companies stated that they do not have information about Cloud ERP. An interviewee from a consultation accounting company that uses Pastel and Excel mentioned that they did not know anything at all about ERP. They also did not have information about the cloud. However, they stated that they will be willing to know about the system that can make their operations easier at a low cost.

“I have seen some adverts about Cloud, but I haven’t really paid attention. If it is something that will save me money, I can consider it.” (Participant 14)

Another engineering company stated that they are willing to know more about Cloud ERP. They however have knowledge about On-premise ERP and how expensive it is.

“I would like to hear more about it. I usually use Google drive to keep my files that I use when here in the office and I access them at home”. I am interested in doing my human resources operations in the same way.” (Participant 8)

Based on this observation, we have formulated our second hypothesis.

Hypothesis Two

Lack of knowledge about Cloud ERP negatively affects its adoption.

Satisfaction with existing system

All companies that have adopted some kind of ERP system seem to be satisfied with their systems and do not want to try a new technology.

“We have spent a lot of money on the system, and we will need a very convincing reason to invest in another.” (Participant 2)

“Even though our organization is quite small, our business concept is quite complex to an extent that an ERP system we are using is subject to a lot of frequent customization. Therefore, hosting internally makes it easy for ongoing change management. Secondly, it might be a challenge to integrate other small non-ERP systems that we have.” (Participant 16)

There were however participants that are willing to move to the cloud on condition that the cloud was trustworthy.

“Currently we are satisfied with BusinessOne, but we are open to keeping up with the technology if the Cloud becomes reliable.” (Participant 7)

These findings concur with Faasen et al. (2013) who reported that, if the participants deem their existing system suitable for the desired purpose, the intention to adopt a new system will be negatively affected.

From this observation, we have formulated our third hypothesis.

Hypothesis Three

Satisfaction with the existing ERP system has a negative effect on the intention to adopt Cloud ERP.

Innovation Characteristics

Innovation characteristics refer to characteristics that individuals or companies consider when adopting a new innovation (Rogers 1995). According to the DoI framework, relative advantage, compatibility with already existing system, testability, complexity and observability are the core innovation characteristics to influence the adoption. For this study, we found compatibility and costs as major factors affecting the adoption intention.

“We have already invested so much in consultants that we have in the company by sending them for training. Are the systems compatible or do they also have to be trained again. I honestly don’t think it is worth it.” (Participant 2)

Similar to the findings of Gupta, et al. (2013), saving costs does not seem to be a priority factor for implementing Cloud ERP. This study found that companies that have implemented ERP did not seem to be concerned about low cost that come with cloud ERP. However, companies that have not implemented any ERP system seem to be attracted by low prices.

Based on this observation, we have formulated our fourth hypothesis.

Hypothesis Four

Perceived incompatibility between the existing on premise systems and Cloud ERP has a negative effect on the decision to adopt ERP.

Organization Characteristics

Organizational characteristics refer to the environment in which the organization is operating, be it the industry or the city. Rogers (1995) stated that the environment can affect the decision to adopt the system. For instance in this study, security assurance of the third party organization offering the service, internet reliability and satisfaction with the existing system are the factors found to affect Cloud ERP adoption.

Internet connectivity

Network connectivity turned out to be a major concern that seem to lead to the reluctance of Cloud ERP adoption. Network connection is needed for the usage of Cloud ERP, as the data is available online.

“Another problem with the cloud is that, everything depends on the internet. The internet connection here is not so reliable, we sometimes experience a few breakouts. This can be a problem adopting cloud.” (Participant 5)

“Fixed internet such as WIMAX and ADSL is not so reliable, 4G is more reliable and fast but it is very expensive. If we have to pull data everyday it will cost us.” (Participant 6)

“What would happen if I am busy working on the system and then I lose the connection for example or the power goes off.” (Participant 6)

“The internet is still very expensive, and its speed is not yet at the level to conveniently support Cloud ERP.” (Participant 20)

Lewandowski (2013) also found that users have technical performance concerns. Based on this observation, we have formulated our fifth hypothesis

Hypothesis 5

Unreliable internet connection has a negative effect on the decision to adopt Cloud ERP.

Data security

Data security is one of the dominant factors for why companies are reluctant to adopt Cloud ERP. They feel insecure about giving their data to third-party companies and not having control over them.

“I cannot imagine our data being stored in an unknown location somewhere and we won’t even have access control. We won’t even know whether competitors won’t have access to them. I am not even sure how many data centers worldwide my data would be stored in. There are too many hackers in the world.” (Participant 13)

“My main concerns are on the security and confidentiality of information. Once the data is lost, there might be no trace back” (Participant 1)

“I have fear of data breach by external parties. Our information is too sensitive.” (Participant 15)

“Anything going through the Internet is susceptible to attacks.” (Participant 20)

These findings are similar to those of Faseen (2013), Lewandowski et al. (2013), Gupta et al. (2013) who reported that customers risk losing control over their data.

Based on this observation, we have formulated our sixth hypothesis.

Hypothesis 6

Data Security concerns have a negative effect on the decision to adopt Cloud ERP.

SUMMARY OF FINDINGS

The above findings have shown different factors that affect the adoption of Cloud ERP. Attitude towards adopting a new technology, lack of knowledge about Cloud ERP, and satisfaction towards the already existing system have a negative effect on a decision to adopt Cloud ERP.

Concerns regarding compatibility between the new system and the existing system also negatively affect the decision to adopt Cloud ERP, whereas perceived low costs positively affect the decision to adopt Cloud ERP. However, this seems to be the case only for companies that have no existing ERP implemented.

Security is the main factor leading to the reluctance of adoption. The fact that companies have to give access to their information to another party leads to fear which in turn leads to the reluctance of adopting cloud services.

Internet connection reliability in Namibia also negatively affect the intention to adopt Cloud ERP, as Cloud services solely depend on the Internet to work but the internet is perceived to be unreliable.

Figure 1 summarizes the different factors that affect the adoption of Cloud ERP. It also shows causal relationships among the factors. A minus sign shows the negative effect, while a plus sign indicates a positive effect between variables.

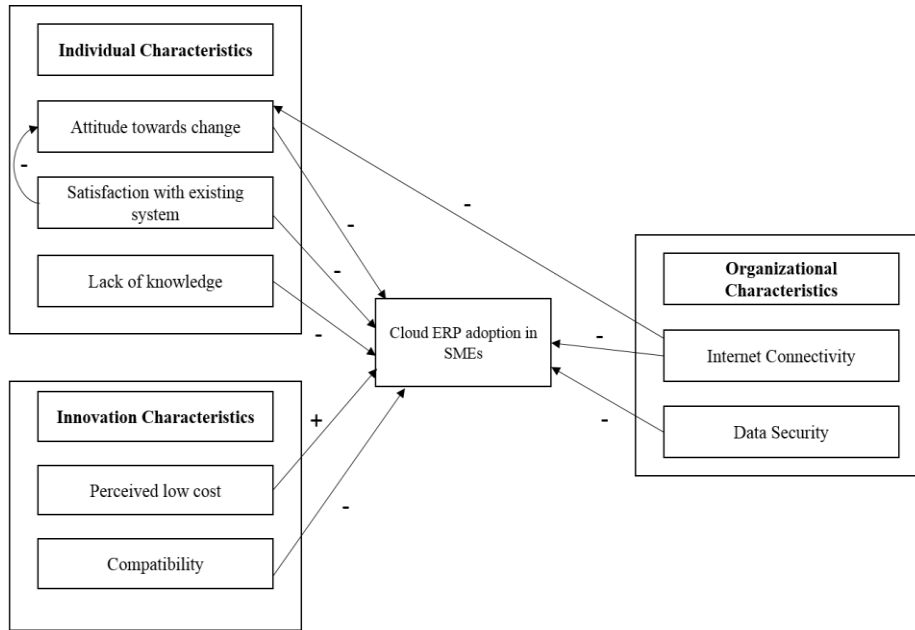


Figure 1: Factors that affect Cloud ERP adoption in Namibian SMEs

Limitations

The findings of the study are based on the participants from twenty SMEs, and therefore the findings may not necessarily represent all Namibian SMEs. In addition, due to the rapid change in technology, the perception of participants may change over a period of time when their knowledge about Cloud computing becomes adequate.

DISCUSSION AND CONCLUSION

The study has examined several factors that lead to the reluctance of Cloud ERP in Namibia based on individual, innovation and organizational characteristics. Similar to the studies done in South Africa (Lechesa, Seymour, and Schuler 2012; Faasen, Seymour, and Schuler 2013), factors found to affect the adoption of Cloud ERP are in line with the factors found in this study. In addition, the research has also identified that organizations that have implemented ERP and those that have not, have different attitude towards adoption. Organizations that have implemented On-premise ERP feel that they have already invested a lot of money and therefore see no point of investing in a new technology. Even though they have knowledge that Cloud ERP does not come with upfront capital costs, they have indicated that they are satisfied with their current systems, and therefore would not consider moving to the cloud. They also seem to have a negative attitude towards Cloud computing in general, perhaps because it is not well adopted in Namibia. However those with no ERP in place are willing to get more information about it.

Compatibility does not seem to be a major factor as found by Faasen et al. (2013), and Gupta, Seetharaman, and Raj (2013). This could be because the interviewed companies have not had any trial with the system. But concerns were raised regarding heavy training costs. Companies queries whether training already given will be sufficient or whether new training will be necessary, whether they would still be useful with the new systems or whether they should be trained again.

It seems that internet connection is also a main concern, as many participants have mentioned that they experience internet disconnections. The fear of work disruption seem to also affect the adoption intention negatively. This finding is similar to Lewandowski (2013), that users are concerned about technical failures.

Based on the different categories of adopters in the DoI theory, Namibian SMEs seem to fall under the laggards' category. This category refers to people who fall behind in adopting emerging technologies (Rogers 1995). However, this is not very surprising because Namibia usually looks up to South Africa in many areas and the adoption in South Africa is still low (Lechesa, Seymour, and Schuler 2012; Faasen, Seymour, and Schuler 2013). Based on this background, it would be of interest for a similar study to be done in the next few years.

It also seems as though there is little presence of Cloud ERP providers in Africa, but there seems to be an interest within organizations that have not yet implemented any form of ERP. It is recommended that international Cloud ERP providers make their presence in Africa, and since some participants have stated that reliable internet connection is expensive, these providers can consider partnering up with internet service providers to provide affordable internet deals.

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