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READINESS FOR ADOPTION OF CLOUD COMPUTING AS A BUSINESS STRATEGY: A CASE STUDY OF SMALL TO MEDIUM ENTERPRISES IN BULAWAYO, ZIMBABWE

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Abstract

This study explored the readiness of Small to Medium Enterprise (SMEs) to adopt cloud computing as a business strategy. The positivist philosophy, underpinned by quantitative methodology was employed where questionnaires were sent to systematically sampled SMEs in the Bulawayo Urban Centre. The findings revealed that, despite the advantages of cloud computing, most SMEs are notably young and small with the management not ready to migrate to cloud computing and therefore are not willing to commit resources to put in the necessary infrastructure. On the other hand, the government has not done enough to promote the use of cloud computing by SMEs. This indicates a possible lack of awareness of the benefits of the cloud to SMEs. There is a serious lack of useful skills in SMEs to leverage the technology. Power cuts and expensive Internet access exacerbate the plight of the SMEs to move to the cloud.

Keywords: Cloud Computing, e-readiness, Small and Medium Enterprises, Organisational preparedness

INTRODUCTION

In Zimbabwe, soon after political independence, many multinational companies that sustained the economy migrated to other countries (Chirisa et al., 2012). The country faced many economic challenges; chief among these was unemployment, which drastically increased to over 70%, and the country was unable to meet its obligations to the World Bank and the International Monetary Fund (IMF) (Chisasa, 2013; Maunganidze, 2013). The economic base was only supported by the large well established companies, without SMEs. Sooner the government later realised that SMEs contribute immensely to the Gross Domestic Product (GDP). Indeed SMEs are the lifeblood of a vibrant economy (Sharma et al., 2012) and needed to be empowered (Maunganidze, 2013). This is what triggered the move by government for black empowerment.

The black empowerment and indigenisation policies implemented by the Zimbabwean government have resulted in the sprouting up of a number of SMEs across virtually all sectors of the economy (Nyangara, 2013). Unfortunately, these SMEs have to compete globally to survive, in a turbulent economic environment (Mpofu & Chigwende, 2013). However most SMEs still use the traditional methods of doing business, namely manually creating spreadsheets, without efficient processes for organising their data and information.

These SMEs cannot be expected to be competitive in the current prohibitive and digital environment without adequate investment. As such these under-capitalised SMEs continue to use their traditional ways of doing business, despite having to compete in the global markets (Kshetri, 2010; Abdollahzadehgan et al., 2014). Most SMEs therefore disappear in their infancy, because the lack of global competitiveness alluded to earlier (Abdollahzadehgan et al., 2014). Moreover, in recent years, global recession has made it difficult for SMES to navigate and respond to the volatile global economic environment, especially those in developing countries (Ojukwu, 2006; Ismail et al, 2011).

The advent of cloud computing brought in new ways of doing business that SMEs should take advantage of and should consider migrating to (Makena, 2013). However, there are many questions that need to be answered with respect to the state of performance of these SMEs. To what extent have they embraced modern forms of catalyzing business performance; such ways like cloud computing as a strategic choice for gaining competitive advantage? What is their state of preparedness to embrace cloud computing are the necessary policy frameworks and infrastructure that enable the SMEs easy access to cloud computing and other emerging technologies there? What challenges if any, are faced by SMEs to migrate to cloud computing?

Many researchers have concentrated their researches on barriers, threats and benefits of cloud computing to developing countries. Despite the researches done, there is limited

infoand this provides numerous research possibilities. Their findings have been useful to explain the differences between performance of SMEs in respective countries with regards to their level of economic development, heir political history and their other unique environmental factors that affect them. This study sought to explore the level of preparedness of SMEs in Bulawayo in particular but Zimbabwe in general, to embrace cloud computing as a business strategy. In this study, the focus was on exploring the readiness of these SMEs to make a paradigm shift and adopt the new technology as a business strategy. To this end, the study looks at current level of ICT utilisation and highlights barriers that affect capacity to adopt it. Thus the major objective of the study was to explore the general state of preparedness of SMEs for the adoption of cloud computing as a business strategy thus the following questions were addressed:

This study has potential to contribute positively to relevant ministries in the country, the managers and owners of the SMEs and the respective governing bodies to reflect upon what they could do to create sufficient ground for SMEs to migrate to cloud computing. The findings of this study should provide the base for the improvement of the current operating environment and state of IT infrastructure of SMEs. It is also hoped that the findings would help the stakeholders, researchers, practitioners and government to craft enabling policies and continue to improve enabling environment to encourage SMEs to use the cloud as a business strategy.

THE CONTEXT OF THE STUDY

According to Hinde and Van Belle (2012) cloud computing has fundamentally changed the information technology (IT) landscape for small, medium and micro-enterprises (SMMEs). SMEs need to adopt cloud computing to remain relevant and competitive in the context of new and more competitive markets that have emerged due to globalisation (Makena, 2013). Organisations that fail to adapt or lack technological tools to access global markets will disappear in their early years. SMEs in developing countries are generally too under-capitalised and too poorly resourced to emerge from the prohibitive traditional models of doing business and embrace the digital platform. Cloud computing is perceived to have the capacity to dramatically lower the cost of technology for smaller firms, by allowing them access to hardware, with no upfront capital investments (Hinde and Van Belle, 2012; Yeboah-Boateng and Essandoh, 2014; Sahandi et al., 2013; Makena, 2013).

The small and medium enterprises sector is a big player in the Zimbabwean economy, and is estimated to contribute an estimated 60% of the GDP and 50% of total employment (Zimbabwe Government, 2011). SMEs are an important part of most emerging economies. According to Hinde and Van Belle (2012), SMEs in South Africa “contribute 56% to private sector employment and 36% of the GDP.” Mashinganidze (2013:4), notes that the contribution

of SMEs to economic activities can help improve the economic outlook of a country, such that many businesses experience higher profitability. These assertions emphasise the importance of SMEs to a country's economy and to the betterment of living conditions of people in a country.

Bulawayo used to be hub of industrial development in Zimbabwe, but industries virtually collapsed following firm closures that took place at the height of the 2007-2008 hyperinflationary environment (Nyambayo, 2014). Many people lost their employment during those dark years of economic recession, and today, many SMEs in Bulawayo are still struggling to survive. There is a need to support SMEs, to bring Bulawayo back to its heydays as the country's industrial hub. Block (2011) has noted that "most businesses are, however, undercapitalised" and hence, cannot buy state-of-the-art technology to compete on the global market. Several researchers have extolled the virtues of cloud computing as a technology that is suitable for SMEs (Choo, 2010; Abdollahzadehgan et al., 2014, Sharma et al., 2010; Kshetri, 2010) to be competitive on the global market. Thus, the study explored the readiness of SMEs in Bulawayo to embrace cloud computing as a business strategy. With the Zimbabwean economy in stagnation (as of June 2014), SMEs need to be helped to be more productive and efficient, as this will not only be beneficial to SMEs, but will also cascade down the whole economy.

The study utilised the readiness assessment model proposed by Ogunyemi and Johnston (2012). The researcher used a conceptual readiness framework adapted from Ogunyemi and Johnston (2012) called National e-readiness, organisational preparedness, industrial relationships, internal resistance and external influence (NOIIE) to assess the readiness of SMEs in Bulawayo to adopt to cloud computing.

BENEFITS OF CLOUD COMPUTING TO SME IN DEVELOPING COUNTRIES

Due to globalisation, economies worldwide have been transformed become knowledge-based, thanks to the proliferation of cutting edge ICTs (Kapurubandara and Lawson, 2006). Organisations, no matter their size, can take advantage of emerging technologies to carve out their own market niche–not just locally, but also globally (Makena, 2013; Alam and Noor, 2009). The emerging technologies help organisations to be more innovative and more competitive, while at the same time, becoming more cost effective (Abdollhzadehgan et al., 2010; Sahandi et al., 2013; Makena, 2013). Despite the advent of these welcoming developments of new technology, SMEs in developing countries still face challenges to harness the modern technologies in order to be competitive on the global market. Many researchers have shown that SMEs in developing countries lack the capital to invest in ICT and other emerging technologies (Yeboah-Boateng and Essandoh, 2014; Abdollhzadehgan et al., 2010; Sahandi et al., 2013). One way of circumventing this challenge is to embrace and migrate to cloud

computing, which is a relatively new technology on the market. Kannabiran and Dharmalingam (2012) note that although cloud computing has some drawbacks related to its use, there are many advantages for SMEs in adopting this new phenomenon.

One strategy for SMEs to be more efficient and be present in the economy is to use appropriate Information and Communication Technologies (ICT). ICTs give SMEs competitive edge and bring in new improved ways of managing and organising a business (Makena, 2013; Yeboah-Boateng and Essandoh, 2014; Ismail et al., 2011; Alshamaila et al., 2013). Zimbabwe ICT policy for 2012 to 2015 aimed at promoting use of ICT by SMEs to achieve 10% ICT usage every year (Zimbabwe ministry of Information, Communications and Technology (MICT) Planning Document, 2010).

While cloud computing is a relatively new computing paradigm, SMEs can adopt it to reduce costs and access latest technology without capital expenditure (Misra and Mondal, 2011; Choo, 2010). Khan et al. (2011), estimate that a total of 70% of IT budgets are used to maintain traditional IT systems (computers, storage, servers and networks) and labour costs, but a massive 85% of IT systems are unutilised and remain idle. Sahandi et al., (2013), note that "cloud computing has the potential to play a major role in addressing inefficiencies and make fundamental contribution to the growth of enterprises mainly for SMEs." With cloud computing, SMEs become more agile and adapt quickly to changes in business environment and hence become more competitive (Sharma et al., 2010). Knowledge-based economies have put customer needs at the forefront, and hence, customers now demand improved quality of service (Alshamaila et al., 2013). Companies need to adapt to these demands to remain afloat.

Cloud computing has opened a wide range of opportunities in developing countries. It has been touted as a panacea for small to medium enterprises (SMEs) to grow their businesses and reach out to the global market (Makena, 2014; Kapurubandara and Lawson, 2006). Marston et al. (2011), in giving their point of view on the importance of the cloud to businesses identified SMEs as the major beneficiary of this computing paradigm. According to Marston et al. (2011:178), "the cloud provides the opportunity for new entrants amongst the SMEs in various business sectors to leapfrog, and compete with larger enterprises in the market." Makena (2013:517), also notes that if "SMEs have access to scalable technologies, they could potentially deliver products and services that, in the past, only large enterprises could deliver."

SMEs are affected by initially high investment costs, so cloud computing technologies enable SMEs to access IT infrastructure without need to buy servers, applications, and other related tools, but to only pay for the services they use (Makena, 2013; Choo, 2010; Kshetri, 2010). This helps businesses to overcome the small size disadvantages and improve the competitive nature of their businesses (Makena, 2013). Cloud computing helps organisations to

reduce capital expenditure in terms of upfront investments, where it is “cheaper to rent server space for a few hours than to maintain property servers” (Choo, 2010:2, Kshetri, 2010).

Cloud computing allows for the efficient use of business resources, because the idea of a “pay as you use” model is highly attractive option for SMEs, particularly in a turbulent global economic environment (Aleem and Sprott, 2013, Alshamaila et al*.,* 2013). Cloud computing “can lower IT barriers to innovation” by providing all applications on the Internet (Makena, 2013). Unlike traditional models of computing, cloud computing is independent of location, which means that company services can be accessed from anywhere, as long as there is access to the Internet (Yeboah-Boteang and Essandoh, 2014), on a wide variety of devices, regardless of the local hardware on which the software is used (Bayrak, 2013; Dwivedi and Mustafee, 2010). This is also important as employees can telecommute, thereby helping to reduce carbon footprint.

Sharma et al. (2010a), note that the cloud makes it easier for businesses to be flexible and to scale their services up or down, depending on user requirements. Companies have different demands over time; therefore, their need for computing services also varies over time (ibid.). The scalability of computer resources depending on demand saves money and reduces idle time (Carcary et al*.*, 2013; Yeboah-Boteang and Essandoh, 2014). According to Aleem and Sprott (2013:9), “the ability to increase data execution time is one of the main reasons organisations opt for use of the cloud.” With cloud computing, according to Bayrak, (2013:5), “SMEs and start-ups are able to deliver speed and agility, to update operations and to reduce time to market, as well as to improve customer engagement and success.” The SME will therefore focus on core business, rather than on technology issues. This removes the need for users to install, update or buy licences for new software and other applications (Sharma et al*.*, 2010a; Hutchings et al., 2013; Choo, 2010).

METHODOLOGY

The research explored the readiness of SMEs to adopt cloud computing as a business strategy. A positivist paradigm was considered convenient because it produces quantitative data that can be used to generalise findings from a sample. This research used a survey strategy because of its relevance to the deductive approach of this research. Many SMEs, spread over a large geographically dispersed location were involved in this study therefore the survey strategy was deemed to be the best method available to collect original data from the large population. The researchers used systematic random sampling approach was adopted and structured questionnaires were distributed to every unit of the sample.

The over 240 SMEs registered with Bulawayo Association of SMEs was used as the sampling frame. These SMEs were involved in diverse areas of business. Those SMEs which had been in operation for less than three months were removed from the list because they were deemed not to have had enough time to consider setting up the cloud computing technological capabilities. After the removal the list was reduced to 180. The SMEs on the list are arranged according to date of registration, systematically. This meant that after selecting the first SME thereafter every third SME on the list was sampled. Thus, 60 SMEs were sampled ((179-2)/3) + 1 = 60) and were used for this study.

Questionnaires were distributed to all 60 SMEs in Bulawayo. The manager / supervisors or owner of the SMEs were requested to respond questionnaires because these individuals were considered responsible for stirring the direction the organisation takes. The questionnaire comprised of three sections: viz. Section A to Section C. Section A asked demographic information and generated a business profile. A five-point Likert scale was used for Sections B and C in which a list of statements was provided for people to answer by showing the extent to which they agreed or disagreed with a statement. Section B asked respondents to identify challenges they faced in an attempt to migrate to cloud computing. Section C consisted of NOIIE model questions, which asked respondents about their readiness to migrate to cloud computing.

The adoption variables were taken from previous studies on the NOIIE model by Ogunyemi and Johnson, (2012). Table 1 shows the variables that affect adoption of Cloud Computing by SMEs, themes in each variable and the section of questionnaire in which each theme is found.

Table 1: Questionnaire composition

Variable Readiness areas (NOIIE)	**Description of each variable**	**Question Number(s)**
National E-Readiness	• Internet connectivity • Legal environment • Business environment • Government policy and Vision • Consumer and business Adoption	**Section C:** 16 o, q, r, s, u v, w, x, y
Organisational Preparedness	• Governance • Technology • Product awareness	**Section C:** 1,2,3,4,5,6,7,8,9,10,11,12, 13, 14, 15 16a, b, c, d, h, j, k, j, m, n

Industrial Relationships	• Product availability • Service level supports • Product license • Drive for competitiveness	**Section C:** 16i, n, t, x, z, aa, bb, cc
Internal Resistance	• IT staff • Application owners • Top executives	16e, f, g, h, cc, bb
External Influence	• Peer organisations • Business associates	16i, p, q

Table 1….

(Adapted from NOIIE model from Ogunyemi and Johnson, 2012).

Out of the 60 questionnaires sent out to the respondents, 56 were returned. From this batch of 56 questionnaires, two questionnaires had many unfilled spaces, and hence, were discarded. A total of 54 valid questionnaires were used to analyse the data. This number constituted a 90% response rate. This high response rate among other things was achieved by physically taking the questionnaires to people and asking them where possible to complete them while the researcher waited. After the collection of filled questionnaires, the responses were cleaned, coded, organised and analysed quantitatively.

ANALYSIS

Descriptive Statistics

For descriptive statistics, frequency tables and graphs were used to analyse the demographic details of the sample.

The results showed that 61.1% of the respondents were males, while 38.9% were females. This shows that more men own or manage more SMEs than women manage. This is a true reflection of the patriarchal nature of Zimbabwean society (Radu and Checkera, 2014) where, in a normal African setting, men work and support their families while women look after children at home. The fact that 70.4% of the respondents were the business owners could be a sign that majority of SMEs are not operating to full capacity to hire skilled managers to run the show.

On educational qualifications, at least 94.5% of the respondents had a minimum of a technical college qualification (See graph below). These findings are summarised in the figure 1.

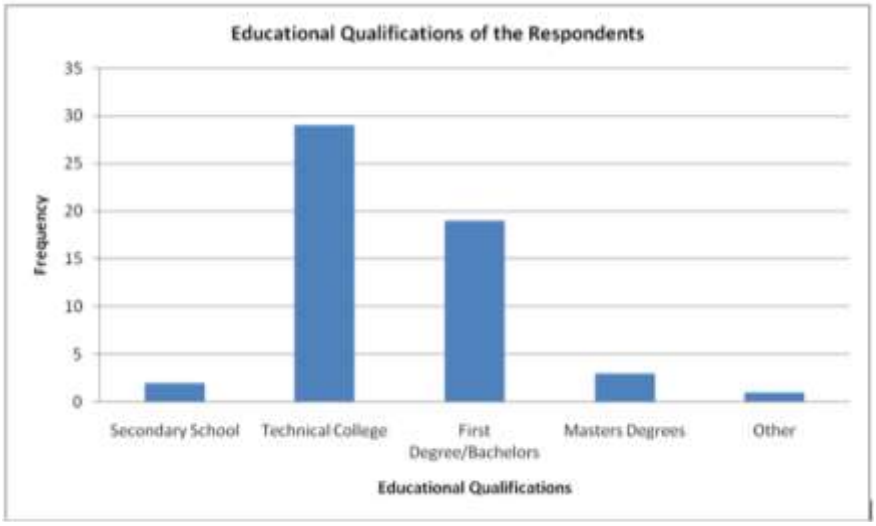

Figure 1: Educational Qualifications

On the surface, this would indicate a high calibre of the owners and managers as the majority of SMEs are managed by technically qualified individuals. It shows that they potentially have capacity to understand and manage cloud computing. However these individuals do not necessarily have the necessary managerial skills to design enabling policies for the organisation.

In terms of composition of the respondents, the textile and clothing sector was the largest industry with 20.4% followed by the construction industry with 13.0%, Pharmaceuticals came third with 11%. The textiles and clothing industry dominates the SME sector largely because it has easy of entry because it does not require heavy machinery.

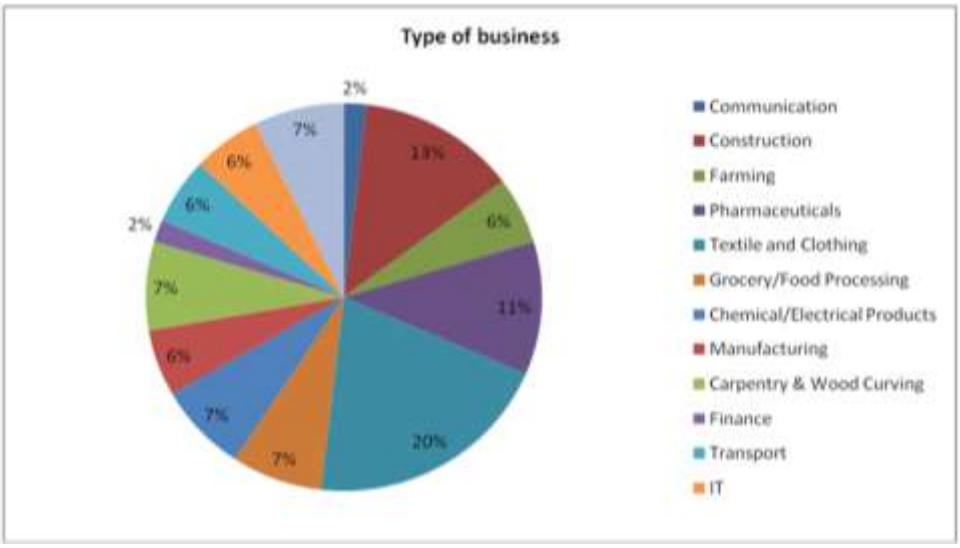

Figure 2: Business Type

The pie-chart above (figure 2) summarises the different types of SMEs who participated in the study. On employees, 92.6% of the SMEs employed nine or less people and only 2% had between 21 and 50 employees. The results show that 74.1% of the SMEs are still young between one and five years of existence while 1.9% have existed for between 11 and 15 years.

The graph below shows the composition of employees in the SMEs that participated in the study.

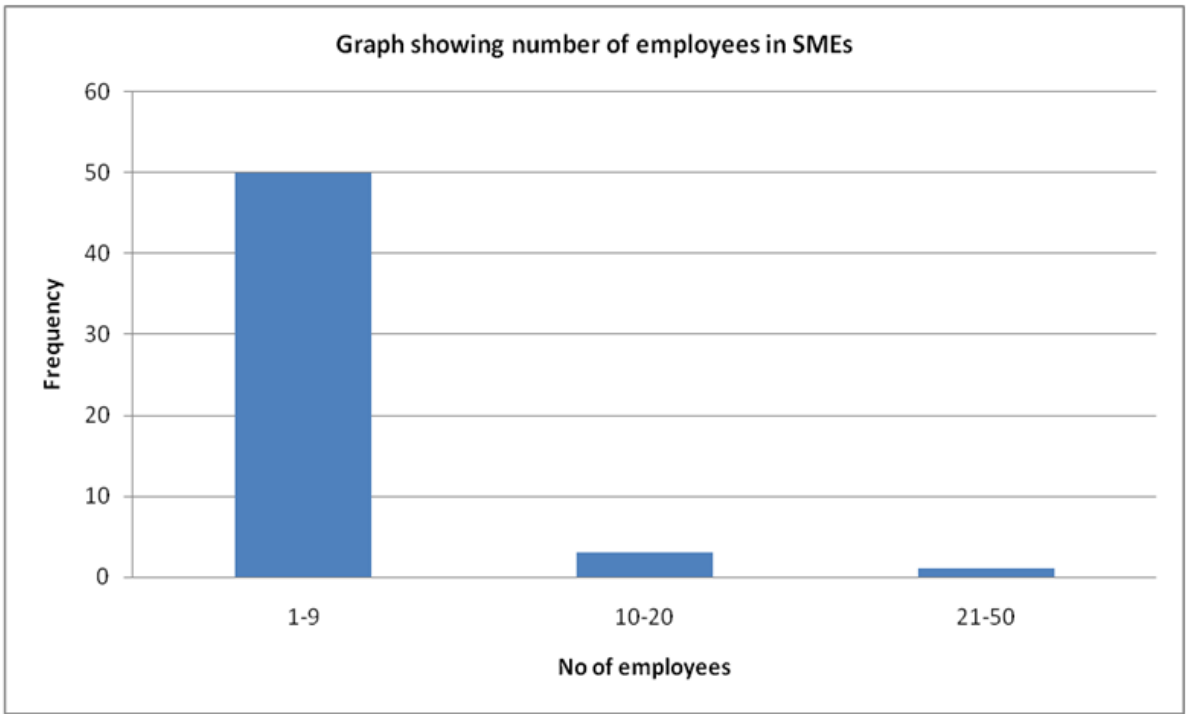

Figure 3: Number of Employees

The following section continues to highlight findings from descriptive statistics of the study on factors affecting Cloud Computing adoption by SMEs in Bulawayo.

- *IT Infrastructure*

This study showed that lack of infrastructure and lack of ICT technical and managerial capacity were obstacles to SMEs in adopting advanced ICT to enhance their business processes. Generally, the SMEs lacked necessary technology to enhance business processes.

- *National E-Readiness*

The study showed that there was lack of the necessary national IT infrastructure that encouraged SMEs to migrate to the cloud. Zimbabwe is generally a cash society and thus SMEs have undeveloped on-line payment systems. Furthermore, cloud computing service providers are not visible.

- Power failure and inadequate electricity supply

Power failure, inadequate and highly unreliable electricity supply in Zimbabwe makes it hard for SMEs to adopt to cloud computing. As of 2022, Zimbabwe experiences over 20-hour daily load shedding cycles.

- *Lack of government regulation*

The findings also showed that lack of government regulation was a major setback to cloud adoption by the SMEs. The respondents believe the government has not committed itself enough to put in place enabling environment to encourage SMEs to adopt cloud computing.

- Lack of cloud service providers

Unavailability of cloud service providers in the country was also found to slow down cloud computing adoption by SMEs in Bulawayo.

- *Low Internet penetration in businesses*

Low Internet penetration in SMEs was a major factor that affects Cloud Computing adoption in Bulawayo.

- *Negative People factors*

The research findings showed that people skills within the organisation can propel or can be a barrier to cloud computing adoption. Most SMEs were found to be lacking IT internal skill within an organisation, and this hinders cloud computing adoption.

The challenges stated above were explored more using inferential statistics and the findings thereof are described below.

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy/Bartlett's Test of Sphericity

Table 2: Kaiser-Meyer-Olkin (KMO) Measure of sampling Adequacy/Bartlett's test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.840
Bartlett's Test of Sphericity	Approx. Chi-quare	1206.916
	df	253
	Sig.	.000

Table 2 shows results of Kaiser-Meyer-Olkin (KMO) measure of sampling Adequacy/ Bartlett's test of sphericity. KMO and Bartlett's test of sphericity was used to test or assess how suitable the respondents' data were for analysis. For the factor analysis to be suitable, the

Bartlett's Test of sphericity should be significant p< 0.05. The KMO value was 0.840, which is considered good (Malhotra, 2007:615) and the Bartlett's test of sphericity has a value of p =0.000, which is less than p =0.05. The results show that the data were suitable for factor analysis.

Factor Analysis

Factor analysis was used to reduce a large number of variables into a smaller, more manageable set of variables (Williams et al. (2010). The items of organisational preparedness were subjected to principal component analysis (PCA) using SPSS version twenty-two. The PCA revealed the presence of four components with Eigenvalue of less than one. The total variance explaining is 75.556%. The factors were rotated to make them easier to understand and interpret (Pallant, 2013:185). Rotation method used was Varimax. The rotated component matrix produced four components with loadings > 0.5.

Reliability Test

Table 3: Reliability coefficients of different variables

Variable	Number of Indicators	Cronbach Alpha	Reliability Interpretation
External influence benefits	6	0.892	Good
Organisational benefits	5	0.752	Acceptable
Barriers- National readiness	7	0.835	Good
Barriers- Organisational preparedness	5	0.800	Good
Factors- Governance	6	0.835	Good
Factors- People	5	0.805	Good
Organisational preparedness-governance	6	0.832	Good
Organisational preparedness-technology	6	0.926	Excellent
Business environment	6	0.807	Good
Reliability of system	5	0.662	Questionable

Table 3 shows reliability coefficients of different variables. Reliability test evaluates the quality of research instrument. Good quality research instrument increases reliability.

Reliability is measured by the Cronbach alpha coefficient which ranges from 0 to 1 and the closer it is to 1 the greater the internal consistency of items in the scale (Gliem and Gliem, 2003). Chiu and Liu (2008) provided the following rules of thumb for Cronbach's alpha coefficient interpretation:

Alpha (α) < 0.5 unacceptable; Alpha (α)> 0.5 poor

Alpha (α) > 0.6 questionable; Alpha (α)> 0.7 acceptable

Alpha (α) > 0.8 good ; Alpha (α) > 0.9 excellent.

A cut-off value of 0.7 was used to test the reliability of the variables.

Correlation Analysis

Table 4: Correlational Analysis

		Cloud_Adoption	National_EReadiness	OP
Cloud_Adoption	Pearson Correlation	1	.097	.436**
	Sig. (2-tailed)		.506	.002
	N	49	49	49
National_e-Readiness	Pearson Correlation	.097	1	.624**
	Sig. (2-tailed)	.506		.000
	N	49	49	49
OP	Pearson Correlation	.436**	.624**	1
	Sig. (2-tailed)	.002	.000	
	N	49	49	49

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4 shows correlation analysis of three variables. Correlation illustrates the direction and strength of a relationship between two variables (Pallant, 2007). The Pearson correlation between cloud adoption readiness and national e-readiness is 0.077 and p =0. 253, which is greater than p = 0.05. This shows that the correlation is satisfactory, not significant. The conclusion was that there is a strong correlation between the two variables of national e-readiness and organisational preparedness (r=0.624, p= 0.000).

Regression Analysis

Multiple regression was used to predict the readiness of cloud computing adoption by SMEs using national e-readiness and organisational preparedness as independent variables.

Table 5: Regression table ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	160.036	2	80.018	7.243	.002[b]
	Residual	508.168	46	11.047		
	Total	668.204	48			

a. Dependent variable: Cloud adoption readiness of your organisation to adopt cloud computing

b. Predictors: (Constant), OP, industrial relations

The total variance explained by model R squared is 48.9% (F= 2.46) = 7.243, p= 0.02< 0.05 level of significance and this confirms the fitness of the model. There is a linear relationship between dependent and independent variables. The constant or intercept = 5.213 and is not significant since p value = 0.121 > p= 0.05 level of significance.

The regression co-efficient of national e-readiness is -3.707, which is not significant in the model since its p value = 0.089 and is greater than p= 0.05 level of significance. The relative co-efficient of organisational preparedness (OP) is 5.625 and significant in the model, since p value = 0.01, which is less than p=0.05 level of significance. This means that the regression equation is: cloud adoption readiness = 5.625 (OP).

T –Test: Position in the organisation vs. cloud computing adoption

A t-test was carried out to determine if there was a significant difference between perception of managers and owners on readiness to adopt cloud computing. The following hypothesis was put forward: There is a significant difference between perception of managers and owners on readiness to adopt cloud computing of their SMEs.

Table 6: Group Statistics

Position What is your position in the company?		N	Mean	Std. deviation	Std. error mean
Cloud adoption Readiness of your organisation to adopt cloud computing.	1 Owner	38	8.5000	2.95690	.47967
	2 Manager	16	12.5000	4.69042	1.17260

Table 7: Independent Samples Test

		Levene's test for equality of variances		t-test for equality of means						
									95% Confidence interval of the difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	Lower	Upper
Cloud adoption readiness of your organisation to adopt cloud computing	Equal variances assumed	11.895	.001	-3.786	52	.000	-4.00000	1.05649	-6.12001	-1.87999
	Equal variances not assumed			-3.157	20.211	.005	-4.00000	1.26692	-6.64098	-1.35902

As seen from Tables 6 and 7, there is a significant difference between the perception of managers and owners on readiness on cloud computing adoption. Table 6 shows the mean for managers as 12.5000 and that of owners as 8.5000. Table 7 has a p= 0.005, implying that the difference in means is statistically significance since p < 0.05 level of significance.

T-Test: Gender vs. cloud adoption readiness

Table 8: Group statistics for gender and cloud computing

Gender What is your gender?		N	Mean	Std. Deviation	Std. Error Mean
Cloud_Adoption Readiness of your organisation to adopt cloud computing	1 Male	33	9.8788	3.83860	.66821
	2 Female	21	9.3810	4.23646	.92447

Table 9: Independent Samples Test for Gender vs. Cloud Adoption

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Cloud_ Adoption Readiness of your organisation to adopt cloud computing	Equal variances assumed	.115	.736	.446	52	.657	.49784	1.11555	-1.74068	2.73635
	Equal variances not assumed			.436	39.601	.665	.49784	1.14068	-1.80830	2.80397

As can be inferred from Table 8, the mean for male is 9.8788 and that of female is 9.3810. The means show that there is no significant difference in Readiness to adopt Cloud Computing between the two genders. Levene's Test for equality of variances show that equal variance assumed has a value of 0.446, which is > 0.05, and this means that there is no significance difference between males and females when it comes to readiness to adopt cloud computing.

DISCUSSION OF THE FINDINGS

After using multiple regressions to predict cloud computing adoption readiness by SMEs in Bulawayo the following equation was derived:

Cloud Adoption Readiness = 5.625 (OP).

OP stands for organisational preparedness. This means that the most important factor affecting cloud computing adoption by SMEs is organisational preparedness. OP included Governance, Technology and Product awareness. Surprisingly, National e-readiness has been found insignificant.

Owner/ Manager Perception

T-tests of position and adoption revealed a big mean difference between managers and owners. Surprisingly, 38 owners had a mean of 8.4, while only 16 managers had a mean of 12.00. This reveals that owners were more reluctant to adopt cloud computing, while managers were in favour. Interestingly, the findings were not different from other research findings. The total commitment of the owner has been found to be of paramount importance in cloud computing adoption. Low et al. (2011) found that top management support was a significant discriminator between cloud adopters and non-adopters. This is because the owner has full control of the organisation's financial and human resources (Elbeltagi et al., 2013). Without the support from top management, there will be resistance from employees, which can become a barrier to adoption of the cloud (Aldmour and Elayan, 2012). The owner should lead from the front to show commitment.

Gender and Cloud computing adoption

The researcher found that there is no significant difference between men and women in the way they adopt cloud computing. Interestingly, the findings are similar to those of Aldhmour et al. (2012) as well as Dwivedi and Lal (2007), who concluded that there was no significant statistical difference between genders in-so-far as perception towards adoption of a new technology is concerned. Zimbabwe is a patriarchal society, but the poor state of economy (2014) has forced women to come out of their shells to fend for themselves.

In contrast to these findings, some researchers found that gender affects adoption of a new technology. Hernandez et al. (2011) found that gender clearly affects an individual's decision process in the adoption of new technology. They found that men's focus on technology was more intense than that of women.

Educational qualification of the owner

The educational qualifications of the sample reveal that the majority 29 (53.7%) of the respondents have a Technical college qualification which is lower than the first degree. Technical colleges in Zimbabwe are perceived to train hands-on entrepreneurs. This could explain why there are so many technical graduates who ventured into SMEs. Studies have shown that educational level and IT experience of top management SME are significant predictors of how far can an SME adopt IT. However, in their studies of enablers and inhibitors of Advanced IT Adoption by SMEs, Kannabiran and Dharmalingam (2010) found that IT experience of the owner is not a significant factor influencing IT adoption.

IT Infrastructure

The findings show that 51 (94.4%) of the SMEs have access to an Internet connection, while 41 (77.8%) have standalone computers. The findings also show that 49 (90.7%) do not have IT departments, and that 44 (81.5%) of the SMEs have local customers. Meanwhile, 51 (94.4%) of SMEs prefer cash deposits as the method of payment for services rendered. Kapurubandara and Lawson (2006:5) showed that lack of online payment processes directly inhibit adoption of new technology. This shows that the SMEs in Bulawayo have basic office IT infrastructure, but lack necessary technology to enhance business processes. These findings agree with previous studies (Chinyanyu and Lorraine, 2011) in Kannabiran and Dharmalingam (2011) that show a lack of IT infrastructure such as poor communication infrastructure affects adoption of advanced IT. As many as 40(74.1%) of the SMEs do not have special software like ERP for their business processes to enhance their competitive advantage.

Dharmalingam and Kannabarian (2011) confirmed from their studies that poor ICTs infrastructure and lack of ICT technical and managerial capacity are obstacles to SMEs in adopting advanced ICT to enhance their business processes. In contrast to those findings, Alshamaila *et al.* (2013:265), in their study of cloud computing by SMEs in England, found that "ICT infrastructure was not a major obstacle for the adoption" of cloud computing.

Size of SME and years of operation

The findings show that 92.6% of the SMEs have between one and nine employees, and that 79.7% of the SMEs are less than five years old. These findings show that the SMEs in Bulawayo are both small and young. Their small nature may not necessitate the quick adoption of cloud computing. Previous studies show that size of an SME is an important factor in determining adoption of cloud computing. Dharmalingam and Kannabiran (2011) suggest that SMEs with fewer than 10 employees were less likely to adopt advanced IT than larger SMEs. Li (2011), in Kannabiran and Dharmalingam (2012), found that Chinese SMEs failed to attempt to adopt ERP due to their small-scale operation. This means smaller the firm size the lesser the information interaction hence are less likely to adopt cloud computing.

However, some studies by Alshamaila and Papagiannidis (2012) suggest that by being small, the SMEs are flexible enough to take up any advanced IT without bureaucratic procedures found in big organisations. Their findings show that it is an advantage to be small, because the small organisation is flexible to quickly adopt and adapt to any situation.

IMPLICATIONS OF THE RESEARCH

There is limited empirical research on cloud computing adoption by SMEs in Zimbabwe. This is probably one of the few studies that have been done for SMEs in Zimbabwe. While the findings of this research cannot be generalised to other SMEs in other parts of the country, they however have practical implications for government, vendors, top management and employees in SMEs that want to migrate to the cloud.

To government

The findings show that there is barely enough cloud infrastructure in Bulawayo. This should be the responsibility of the government and the Bulawayo City Council to introduce the necessary policies to entice or better still to partner with cloud service providers to implement the necessary infrastructure, incentivise SMEs and encourage them to adopt cloud computing.

To Vendors

The cloud service providers in should work hard to promote their products. They should try to customise their products to suit a wide range SMEs in Bulawayo. This could help to increase cloud computing adoption by SMEs. The same goes for the Internet service providers. They should make Internet services affordable, and improve bandwidth to handle many users at the same time. Vendors should also think of giving preferential tariffs to SMEs in Bulawayo by reducing tariffs and attract a wider base of SMEs. Vendors should also set up data centres in the country to reduce cost of access to cloud services.

To Top Management (Owner/ Manager)

Top management championship is one of the organisational factors that have been found to be very important in cloud computing adoption by SMEs. The top management must be aware of this technology and be willing to commit resources towards its adoption. If an SME is led by an owner or manager who lacks basic IT knowledge and awareness, then it will miss out on the benefits its business could gain from ICT adoption (Elbeltagietal, 2013). In Bulawayo, 53.7% of respondents possess technical college qualification. This could mean that they are more technically inclined and lack organisational management skills. Perhaps it is important for top management to enrol for management courses as well. This could enable them to sharpen their managerial skills and move their SMEs to a higher level. The management should also involve the employees so that they also know what is taking place in the organisation. This is important to avoid employee resistance when the time comes to adopt cloud computing.

CONCLUSION

This research explored the readiness of small to medium enterprises in Bulawayo (Zimbabwe) to adopt cloud computing as a business strategy. This research followed a positivist philosophy to apply the NOIIE conceptual framework in assessing the readiness of SMEs. Quantitative methodologies were used with questionnaires as instruments.

The findings revealed that most SMEs are not ready to adopt cloud computing as a business strategy. The findings showed that most SMEs are young and small and therefore not mature enough to have foundation for execution in as far as technology is concerned. The findings also revealed that top management in SMEs was either not willing to commit or do not have the needed skills and resources to put in necessary infrastructure in their SMEs to migrate to the cloud. This indicates a possible lack of awareness of the benefits of the cloud to SMEs. The government has not done enough to promote the use of cloud by SMEs. Power cuts and expensive Internet access exacerbate the plight of the SMEs to move to the cloud. Lack of visible cloud service providers makes the situation even worse. Thus, these challenges make it difficult to adopt cloud computing.

The NOIIE framework is still a relatively young framework. The same study could be carried out using other mature frameworks to see if they can come to the same conclusion. The SMEs are diffused in terms of their business operations and, for the findings to be generalised to all SMEs, may not be accurate. Future studies could carefully sample SMEs in the same line of business and explore how they adopt cloud computing as a business strategy. In further studies qualitative methods could also be used to supplement the quantitative approach. This could give a richer picture on adoption patterns of the SMEs. A bigger sample of the SMEs could enrich the results.

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