

Organisational Factors Influencing E-business Adoption in Zimbabwe's Manufacturing Sector

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Abstract: Creating and sustaining competitive advantage through the adoption and implementation of innovative technologies is a strategic imperative for all learning organizations. Despite this, manufacturing companies in developing countries such as Zimbabwe are confronting challenges in implementing e-business practices. Against this background, the objective of this study was to understand organizational factors influencing e-business adoption in Zimbabwe's manufacturing sector. The study was motivated by the need to appreciate factors that facilitate or inhibit the adoption of e-business in the context of developing countries such as Zimbabwe. A questionnaire was distributed to a random sample of 118 companies registered by the Confederation of Zimbabwe Industries in 2015. Regression analysis was used to test the posited hypotheses. Results revealed that manufacturing companies in Zimbabwe differ significantly in their inclination to adopt and implement e-business strategies. Innovation orientation, financial resources, perceived usefulness and size of the firm were found to be positively associated with e-business adoption. The study also found that technological resources did not have a statistically significant relationship with e-business adoption. The study furthers current debate on e-business adoption by identifying the drivers of e-business adoption in the manufacturing sector in the context of a developing country. The importance of this study lies in its contribution to theory and practice. In terms of theory, this study contributes to the body of knowledge on organizational factors influencing e-business adoption and provides avenues for further studies. In practice, the findings of this study add to the insights of managers in the manufacturing sector in developing countries, which influence the adoption of e-business practices.

Keywords: *e-business practices, e-business adoption, e-business efficiency, manufacturing sector, Zimbabwe*

1. Introduction

Study Background: The dawn of the new millennium ushered a new dispensation characterized by 'e-business hype' in the business fraternity (Hinton & Baines, 2009). During the early 2000s (new millennium), the number of companies adopting Internet anchored electronic business practices proliferated (Huy, Rowe, Truex & Huynh, 2012). Empirical evidence suggests that business efficiency and competitiveness have been significantly enhanced by adoption of electronic business practices, more so in the context of developed economies (Huy et al., 2012; Kim & Nam, 2007; Li & Xie, 2012). For instance, Smith and Spiers (2009) note improvements in supply chain management, planning, communication and collaboration by companies in the manufacturing industry. It is also argued that electronic business, hereafter referred to as e-business, has reshaped customer-supplier relationships and streamlined business processes and in some cases, re-engineered the industry's operating philosophy (Cardwell, Harland, Bwell & Zheng, 2013; Chao & Chandra, 2012).

E-business applications that have revolutionised business practice include electronic data interchange (EDI), Just-In-Time (JIT), Quick Response System (QRS), computer-aided-manufacturing (CAM), computer-numerical control (CNC), manufacturing resource planning (MRP), enterprise resource planning (ERP) and product data management system (Chitourou & Souidan, 2010). For this reason, e-business adoption has generated much interest in research and practice (Dube, Chitura & Runyowa, 2009; Tsokota & Solmes, 2013). While the majority of manufacturing companies in developed countries are managing to tap into the opportunities associated with e-business adoption, limited success has been reported in developing countries (Chao & Chandra, 2012). A typical example is the case of Zimbabwe where little success has been reported in terms of successful adoption and implementation of e-business practices (Dube et al., 2009). In particular, researchers such as Chitourou and Souidan (2010) as well as Cardwell et al. (2013) note that companies in developing economies face a host of organizational challenges when implementing e-business practices. Thus, the importance of this study emanates from the need to understand the pertinent factors that drive successful e-business implementation. Since e-business adoption is now a mega trend and a mainstream business norm,

Chao and Chandra (2012) note that manufacturing companies need to effectively implement e-business practices to remain competitive. Moreover, Mupemhi and Mafuka (2006) note that e-business adoption consumes a lot of financial resources, which most manufacturing companies in Zimbabwe struggle to access. Given this background, the importance of this study stems from its contribution in delineating key organizational factors that inhibit or facilitate effective e-business adoption and implementation.

Problem Statement: The adoption of e-business applications in the manufacturing sector in Zimbabwe has been relatively slow and piecemeal (Chitourou & Souidan, 2010). While the adoption of e-business peaked around the late 1990s and early 2000s around the globe, Mupemhi and Mafuka (2006) notes that very few manufacturing companies in Zimbabwe have adopted top-end e-business applications such as interactive websites and integrated infrastructures and networks that provide seamless linkages with value-chain partners. Mupemhi and Mafuka (2006) further note that the majority of manufacturing companies in Zimbabwe only adopted low end e-business tools such as emails and informational websites. According to Chitourou and Souidan (2010), this piecemeal approach to the adoption of e-business practices resulted in decreased levels of competitiveness due to expensive production inputs, inability to manage the production and supply chain and having inadequate market, product and competitor information due to poor or total absence of networks. According to Mupemhi and Mafuka (2006), the few blue-chip manufacturing companies that managed to adopt comprehensive e-business practices are failing to translate this into tangible sustainable gains. Zimbabwe has a high Internet penetration rate with manufacturing sector being at the top, are still reluctant to use the Internet beyond e-mails and basic websites (Mupemhi & Mafuka, 2006).

Although much work has been done in developed countries to identify the factors that drive or retard e-business adoption (e.g. Fillis & Wagner, 2005; Peltier, Schbrowsky & Zhao, 2009), comparatively few studies have been conducted in the context of developing countries. To the best of the researcher's knowledge, there is dearth of these in Zimbabwe. Little is also known about how these factors affect the adoption of e-business and its usage. Since the factors affecting the adoption and application of e-business vary from country to country and industry to industry, there is a need for empirical evidence of these factors in the manufacturing sector in Zimbabwe. Against this backdrop, therefore, this study seeks to determine the factors affecting the adoption of e-business in the manufacturing sector in Zimbabwe and to identify e-business efficiencies that firms in this sector could gain as a result of e-business adoption.

2. Literature Review

This section discusses literature and underpins theories related to organizational factors that influence e-business adoption.

Theoretical Background: The development of e-business practices has evolved over the years. The first phase commonly referred to as the innovation stage involved the development of business user-friendly network technologies (Wang & Sarkis, 2013). The next phase termed the commercialization stage was focused on the adoption of e-business applications by companies (Wang & Sarkis, 2013). This phase was characterized by the catch phrase "Get web or be dead" (Simmons, Armstrong & Dunkin, 2008). The current phase involves the integration of e-business practices into business processes with the objective of creating long-term competitive advantage (Barney, Ketchen & Wright, 2011). As the use of e-business applications grows, there is a realization that there is a marked variation in adoption levels, implementation barriers and success rate among companies (Wang & Sarkis, 2013).

E-business Adoption & Grounding Theories: This technological, organizational and environmental framework was developed by Tornatsky and Fleischer (1990) to explain factors that influence the adoption of an innovation at the organization level. Tornatsky and Fleischer (1990) identify three key features that influence the adoption of an innovation as (1) technological context or the existing technologies relevant to the firm, (2) organizational context or the salient characteristics of the firm such as scope, size and culture, and (3) environmental context or the atmosphere in which business is conducted, including the industry, competition and government regulation.

The Technological Context: Tornatsky and Fleisher (1990) have proposed that the propensity of an organization to adopt an innovation and e-business in particular, depends on the type of information technology (IT) infrastructure and the caliber of IT staff the organization has. The IT infrastructure, on the other hand, is affected by relative advantage, complexity, trialability and observability (Rodgers, 2003). The level and nature of IT resources of the firm must be sound and reliable to inspire confidence and change attitudes (Ramdani, Chevers & Williams, 2013). Therefore, it can be argued that firms with sound IT infrastructure are more likely to adopt e-business. Likewise, firms should have IT staff with the requisite skills if they are to adopt e-business. Relative advantage as a construct in the technological context variable is defined by Rodgers (2003) as the degree to which an innovation is perceived as being better than the one it supersedes. The widespread view in the adoption literature is when e-business is perceived to achieve better results than the traditional tools and strategies to be adopted.

Organizational Context: The organizational context is claimed to have high impact on e-business adoption (Ramdani et al., 2013). This context includes top management support, organizational size, ICT experience and organizational readiness. Top management support is one of the best predictors of e-business adoption (Mnzebele, 2013). Top managers are the initiators of change and can communicate and inculcate values through a well-articulated vision of the firm. Resource allocation to specific projects is dependent on the amount of support provided to that project by top managers. Therefore, the adoption literature links top management support to adoption of an innovation (Wee & Quaz, 2005). Organizational readiness is the extent to which resources (financial, technical, human or material) are made available for the adoption of e-business. Lack of adequate financial resources and limited technical expertise were found to limit adoption of e-business in small businesses (Ramdani, Chevers & Williams, 2013) and are likely to have the same effect even on large firms in developing countries. Previous exposure to ICTs by employees determines how fast the firm can adopt an ICT innovation. Limited experience generates perceived risks. Sunderan, Schwaz, Jones and Chin (2007) observe that the technology already existing in the firm and the knowledge employees have influence the adoption of e-business. The size of the firm has been identified as one of the best predictors of the adoption of an innovation (Hong & Zhu, 2006). The size of the firm can be described in terms of the financial resources available, the market served or number of people employed. All this reflects the resourcefulness of the firm. The adoption literature has found a positive association between size of a firm and adoption of e-business. The argument is that the more resourceful a firm is, the more likely it is to adopt an innovation (Tufail et al., 2016).

Organizational Resources: A widely accepted theory that explains why firms are different in terms of competitive advantages is the resource-based view (RBV) theory. The resource-based view model of a firm was posited by Penrose (1959) and then Winerfelt (1984) as a theory of the firm. It was then popularized through the works of Barney (1991), Peteraf (1993), Barney et al. (1995) and Teece (1997). Since then, there have been numerous publications in support of it (Wade & Hulland, 2004; Stephane, 2007; Kraaijenbrink, Spender and Groen, 2009) or by critiquing it (Weick, 2001; Foss & Knudsen, 2003; Bromiley, 2005). The theory tries to explain the role of the firm's internal resources in generating competitive advantages. It explains why businesses in the same industry and environment might have different competitive advantages and performance levels. This counters the role of external factors in firm performance as posited by Porter (1985) when discussing industry attractiveness and firm performance. The RBV theory argues that firms possess resources and capabilities which enable them to achieve a competitive advantage. These then become the primary source of profit for the firm (Grant, 1991). In this theory, a resource is defined as the asset that is tied semi-permanently to the firm and includes financial, human, marketing, operational, technological or organizational assets (Barney, 1991). The firm's capability, on the other hand, is defined as its capacity to deploy resources. The resources of the firm are deployed as it implements strategies to achieve efficiency and effectiveness. Thus, a competitive advantage is gained if this deployment of resources leads to superior differentiation and/ or lower costs by comparison with a marginal competitor in the product market (Stephane, 2007).

Hypothesis Development: This section posits hypothesised relationships between variables that constitute the research model.

Innovation Orientation: Innovation orientation denotes the predisposition of an organization to adopt and implement novel value creating business ideas (Naranjo-Valencia, Jiménez-Jiménez & Sanz-Valle, 2011). In modern markets characterised by cut-throat competition, companies with a low innovation orientation find it difficult to create and sustain competitive advantage (Simmons & Sower, 2012). An organization's innovation is significantly influenced by its culture (Tyworth, 2014). Previous studies (e.g. Jassawalla & Sashittal, 2002; Becker, 2006; Naranjo-Valencia et al., 2011) found that organisations with a culture of innovation are more likely to adopt e-business practices. Consistent with the foregoing discussion, this study posits that:

H1: *There is a significant positive association between innovation orientation and adoption of e-business.*

Financial Slack: The size of the firm's budget and its liquidity are contextual variables that determine the success of e-business adoption (Wang & Cheung, 2004). The kind of investment a firm can make and the type of strategy it can adopt is largely dependent on its ability to mobilise financial resources (Tyworth, 2014). Financial resources are unique assets that the firm can employ to meet its financial obligations (Wang & Cheung, 2004). According to the Resource Based Theory (Barney, 1991), financial resources can give the firm a competitive advantage since they are unique and inimitable (Fillies, 2002). Literature on e-business adoption identifies the financial resources as one of the critical factors (Van Bervely & Thompson, 2007). Limited financial resources lead to low e-business adoption in the European food sector (E-Business Watch, 2007). Contrastingly, in a qualitative study of five agri-food firms in Greece, Matopoulos, Vlachopoulou and Manthou (2010) observe that lack of financial resources was not a significant constraint to e-business. Based on the foregoing discussion we posit that:

H2: *There is a significant positive association between financial slack orientation and adoption of e-business.*

Firm's Information Technology Resources: The firm's IT resources include the technical and the human component (Wang & Cheung, 2004). The technical component comprises the IT infrastructure installed by the firm while the human component consists of the knowledge and skills related to IT which the employees have acquired. As observed by Morrison and King (2002) and Seabra, Abrantes, and Lages (2007), inadequate IT infrastructure and low levels of IT-related knowledge and skill have a negative impact on ICT adoption. Adequate IT facilities and high levels of IT-related knowledge are likely to be drivers of e-business adoption. Therefore, the study proposes that the firm's information technology (IT) resources have a positive relationship with e-business adoption in the manufacturing sector. Based on the foregoing insights, this study predicts that:

H3: *There is a significant positive association between the firm's information technology resources and the level of adoption of e-business.*

Perceived usefulness: Perceived usefulness is the degree to which the user of a new innovation believes the task and/or the work performed is enhanced by specific technologies or processes. Studies by Davis (1989) and Van der Veen (2004) show a positive relationship between perceived usefulness and the intention to use the innovation. Therefore, based on these studies, the study posits that perceived usefulness is positively related to the adoption of e-business by firms in the manufacturing sector.

H4: *There is a significant positive association between perceived usefulness and the level of adoption of e-business.*

Firm size: The firm's size has often been regarded as one of the main determinants of the adoption of Information Communication Technologies (ICTs) in firms (Bordonaba-Juste, Lucia-Palacios & Polo-Redondo, 2012; Thompson, 2007; Lee & Xia, 2006). Researchers such as Kundi and Shah (2009) argue that microenterprises, small and medium enterprises as well as large enterprises, cannot adopt e-business at the same rate due to differences in financial limits, red tape and inertia levels. For example, Kundi and Shah (2009) note that microenterprises are likely to be more constrained by financial resources although they have the ability to be flexible and more decisive than large enterprises. Firm size influences key organizational factors such as structure, systems, decision making and resources which have a significant effect on e-business adoption (Rogers, 1993). Therefore, it follows that the firm's size exerts an influence on its e-business adoption in the manufacturing sector.

H5: *There is a significant positive association between the firm size and the level of adoption of e-business.*

3. Methodology

The population consisted of large manufacturing firms in Zimbabwe. The manufacturing sector was selected because it is one of the major contributors of gross domestic product and the main driver of industrialization in Zimbabwe (Mupemhi & Mafuka, 2006). Also, the competitive globalized marketplace to which manufacturing companies in Zimbabwe are exposed to calls for strategies to improve business efficiency. The study employed a quantitative research method and cross-sectional data was collected using a structured, respondent administered questionnaire. A probability sampling method in the form of systematic random sampling was used to select respondents. The Confederation of Zimbabwe Industries membership list of 2015 was used as a sample frame. The Krejcie and Morgan (1970) sample estimation table was used. A population size of N=170 translated into a sample size of 118. The sample size was comparable to previous related studies (e.g. Naranjo-Gil, 2006; Hu, 2014; Hassan, 2017). The sample was drawn from manufacturing companies in automotive, chemical and pharmaceuticals, electrical and electronics, leather and textiles, food and beverages, metal fabrication, rubber and plastics, and wood and wood products. Once the companies to be sampled were identified, a telephone call was made to each company's senior management to explain the purpose of the study and to create rapport. Questionnaires were emailed to respondents accompanied by a cover letter explaining the purpose of the research and follow-ups were done using telephone calls and company visits by fieldworkers.

Measurement Instrument: This section discusses the operationalization of variables that are under investigation as follows:

- **Innovation orientation:** A five-item measurement scale was used to measure innovation orientation. The scale was adapted from a study conducted by Huy et al. (2012). The items measured whether the adoption of e-business by the firm was: 1) due to the problems it was facing; 2) a new way of doing business; 3) due to the need for better results; 4) due to the need to adapt to changes in the environment; 5) the firm was happy with the status quo. Respondents were asked to select the best option to describe their situation from those ranging from strongly disagree (1) to strongly agree (5). Each option was given a score from 1 for strongly disagree to 5 for strongly agree.
- **Perceived usefulness:** A five item scale was used to measure perceived usefulness. The scale was adapted from Smith and Spiers' (2009) study. The measurement scale has five items measuring whether managers perceived e-business to: 1) improve firm performance; 2) increase productivity; 3) increase perceived image; 4) improve product and service quality; and 5) improve coordination with suppliers and customers.
- **Financial resources:** This construct was measured using three items that assessed: 1) whether the firm had enough financial resources to meet the ICT needs; 2) whether the firm went ahead to adopt e-business in spite of the inadequate financial resources; and 3) whether e-business strategy was a priority for the firm. The measurement items were adapted from the work of Theodosiou and Katsikea (2010).
- **IT resources:** IT resources were measured using four items that were developed by Ashurst, Cragg and Herring (2011). The items assess the adequacy of IT infrastructure, the requisite technical skills and the knowledge level of e-business. Respondents were asked if their adoption of e-business was due to adequate IT infrastructure, presence of the requisite technical skills or sufficient knowledge of e-business.
- **Firm size:** To measure the firm size, annual sales figures in United States Dollars were used. The annual sales figure ranges used are 0 to 99 000; 100 000 to 999 000; 1000 000 to 1 999 000; and 2 000 000 and above. This range was not adopted from literature but developed to meet the specific conditions of the manufacturing sector in Zimbabwe where annual sales appear to be low. Respondents were asked to indicate the range that best described their firm's annual sales. Lastly, e-business adoption was measured using a four-item scale developed by Theodosiou and Katsikea (2010). Respondents were given a five-point Likert scale ranging from totally disagree (value 1) to totally agree (value 5).

4. Results & Discussion

This section discusses the results of the study as follows:

Sample profile: Owing to the measures employed to create rapport with respondents, the response rate for this study was 100%. The number and size of manufacturing companies that participated per category are shown in Table 1.

Table 1: Number and size of manufacturing companies

Industrial sector category	Size of sample
Automotive	9
Chemical and pharmaceutical	10
Electrical	18
Food and beverages	27
Leather and textile	14
Metal fabrication	15
Plastic, rubber and non-metals	14
Wood and wood products	11
TOTAL	118

E-business applications adopted: Respondents were asked to indicate the e-business applications which their firm had adopted. Table 2 summaries e-business applications adopted by survey companies. As shown in Table 2, the majority of companies have adopted e-mail and websites applications. This shows that the surveyed firms are still at the early stages of e-business adoption as indicated by few numbers of companies which have adopted advanced applications such as enterprise resource planning and online marketing.

Table 2: E-business applications

Category of e-business applications adopted	Number of firms
e-mail	118
Website	118
Supply chain management	36
Customer relationship management	20
Enterprise resource planning	13
Intra-firm communication and collaboration	22
Online marketing	14

Reliability of constructs: The constructs for this study had very high Cronbach values, suggesting consistency and relationship among the various items used. The lowest mean score was 3.24 while the highest was 4.23 out of the highest possible mean score of 5. The highest standard variation was 0.88. This shows that there was less variation in responses given by respondents. Table 3 shows the descriptive statistics and Cronbach alpha coefficients of research constructs.

Table 3: Reliability of Constructs

Construct	No. of items	Mean	Standard	Cronbach alpha
Innovation orientation	5	3.95	0.73	0.92
Financial slack	3	3.24	0.73	0.70
Firm's IT resources	5	4.23	0.82	0.95
Perceived usefulness	5	3.51	0.88	0.90
E-business adoption	4	3.52	0.72	0.88

Results of Hypotheses Testing: Hypothesis 1 posits a significant positive association between innovation orientation and adoption of e-business. The results of the regression between innovation orientation and adoption level of e-business shows the existence of a statistically significant relationship between these two variables at 0.05 significance level as summarized in Table 4.

Table 4: innovation orientation and e-business adoption

Source	SS	df	MS	# of obs=118	R-squared=0.1374	
Model	0.662	1	0.662	F (1, 28) =4.48	Adj R-sq=0.1071	
Residual	4.137	28	0.1477	Prob>F=0.0433	Root MSE=0.3884	
Total	4.8	29	0.1655			
e-business Adoption	Coef.	Std.error	T	P> t	[95% confidence]	
Innovation Orientation	0.827	0.39	2.72	0.043	0.266	1.628
Constant	0.172	0.772	0.22	0.825	-1.409	1.254

As shown in Table 4, a coefficient value of 0.827 shows a strong relationship between innovation orientation and e-business adoption. The R-squared value of 0.1374 and RMSEA of 0.3884 show that almost 13.74 percent of e-business adoption is accounted for by the firm's innovation orientation. This finding is consistent with previous studies by Rodgers (2003), Linda et al. (2003) and Simmons and Soner (2012). This means that manufacturing firms need to always find new ways of solving their problems and e-business adoption is one such solution. Furthermore, firms need to inculcate a culture of receptivity to change in adopting and accommodating new technology (Abu Bakar, 2004). Based on this result, it follows then that in order to enhance e-business adoption, a culture of innovation is of paramount importance.

Hypotheses 2 predicted a significant positive association between financial resources and adoption of e-business. A regression between the financial resources and e-business adoption shows existence of a statistically significant relationship at 0.05 significance level. The results are summarized on Table 5.

Table 5: Financial resources and e-business adoption

Source	SS	df	MS	# of obs=118	R-squared=0.151	
Model	0.726	1	0.726	F (1, 28) =4.99	Adj R-squared=0.1209	
Residual	4.07	28	0.1455	Prob>F=0.0337	RMSE=0.381	
Total	4.8	29	0.1655			
e-business adoption	Coef.	Std.error	t	P> t	[95% confidence]	
Financial resources	0.519	0.232	2.23	0.0344	0.43	0.994
Constant	0.814	0.446	1.82	0.079	-0.998	1.73

As presented in Table 5, the R-squared value of 0.1512 shows that approximately 15.12 percent of e-business adoption observations are accounted for by the presence of robust financial resources to support e-business. Furthermore, the coefficient value of 0.519 shows that there is a moderate strength of the relationship between these two variables. This result gains support from the RBV theory that posit that organizational resources play a central role in e-business adoption (Barney, 2003). This result suggests that a company's survey does not perceive financial resources as an impediment to e-business adoption. Hypotheses 3 posits a significant positive association between the firm's information technology resources and e-business adoption. The relationship was tested by regressing the firm's information technological resources mean scores and those on adoption level of e-business. The results are summarized in Table 6.

Table 6: Firm's information technology resources and e-business adoption

Source	SS	df	MS	# of obs=118	R-squared=0.0221	
Model	0.493	1	0.493	F (1, 28)=0.63	Adj R-sq=-0.128	
Residual	21.8	28	0.778	Prob>F=0.433	Root MSE=0.8824	
Total	22.2	29	0.7687			
e-business adoption	Coef.	Std.error	t	P> t	[95% confidence]	
Firm's resources	IT 0.826	0.104	0.8	0.433	-0.13	0.295
Constant	3.11	0.527	5.91	0	2.03	4.19

Table 7: perceived usefulness and e-business adoption

Source	SS	df	MS	# of obs=30	R-sq=0.1374	
Model	0.662	1	0.662	F (1, 28)=4.48	Adj R-sq=0.1071	
Residual	4.137	28	0.147	Prob>F=0.043	RMSE=0.388	
Total	4.8	29	0.165			
e-business adoption	Coef.	Std.error	t	P> t	[95% confidence	
Perceived usefulness	0.827	0.39	2.72	0.043	0.266	1.628
Constant	0.172	0.772	0.22	0.825	-	1.254

As shown in Table 6, the hypothesis was not supported by the data as shown by a p-value of 0.433 and a t-statistic of 0.8. Contrary to the e-business adoption literature, results showed that the firm's IT resources are not positively associated with e-business adoption. The R-squared value of 0.0221 and the RMSEA of 0.8824 show that although the firm's information technological resources fit as a construct in the e-business adoption model, its contribution in explaining the variance in e-business adoption is very small, at almost 2.21 percent. This result suggests that manufacturing firms in Zimbabwe perceive lack of IT resources as a barrier to e-business adoption. This is consistent with a related study conducted by Morrison and King (2002) as well as Seabra et al. (2007) that found lack of resources as the main impediment to e-business adoption. According to Ilin, Ivetic and Simic (2017), the challenge of lack of resources may be assuaged if national governments in developing countries assist companies to build information technology infrastructure. Hypothesis 4 postulates a significant positive association between perceived usefulness and e-business adoption. The results show that there is a significant positive association between perceived usefulness and level of adoption of e-business at 0.05 significance level. Table 7 presents the results of the test.

The hypothesis was supported with a p-value of 0.043 and a t-statistic of 2.72. Furthermore, results also showed an R-squared value of 0.1374, implying that about 13.74 percent of variance in e-business adoption is accounted for by perceived usefulness. The intensity of the association between these variables is also strong as evidenced by a high coefficient value of 0.827. This result is consistent with that of previous studies (e.g. Park et al., 2012; Kim & Nam, 2007; Thompson, 2007; Shi & Yu, 2012; Grandson & Pearson, 2004). This result further strengthens this notion by showing that perceived usefulness is positively associated with e-business adoption in the manufacturing sector. It suggests that respondents in this study are aware of the benefits of adopting e-business adoption. This knowledge, according to Nguven (2013), plays a central role in the willingness by top management and employees to adopt and embrace e-business practices. The implication of this result is that e-business service providers and other supply chain players need to make the e-business benefits known by top managers or other decision-makers in the manufacturing sector to increase rate of adoption and use. Hypothesis 5 predicted a significant positive association between firm size and e-business adoption. Table 8 presents the results of this hypothesized relationship.

Table 8: Hypothesized Relationship

Source	SS	Df	MS	# of obs=118	R-squared=0.167	
Model	12.077	1	12.078	F (1, 28)=5.64	Adj R-sq=-0.137	
Residual	60.089	28	2.1460	Prob>F=0.0248	R MSEA=1.464	
Total	72.166	29	2.4848			
e-business adoption	Coef.	Std.error	t	P> t	[95% confidence	
Firm size	0.7877	0.3320	2.37	0.025	0.1075	1.467
Constant	0.1027	1.1816	1.78	0.086	0.3171	4.523

The hypothesis was supported by p-value of 0.025 and a t-statistic of 2.37. These values are less than 0.05 and bigger than 2 respectively. The results also show that firm size accounts for 16.74 percent variance in e-business adoption as indicated by the R-squared value of 0.1674. The strength of the association between the two constructs is high as indicated by a coefficient of 0.79. A Root MSE of 1.464 indicates a high fit index

value, suggesting that the construct size fits very well in the overall model. The relationship between firm size and e-business adoption was also confirmed in previous studies (e.g. Hsu, Kraemer & Dunkle, 2006; Zhu, Kraemer & Xu, 2003). These studies note that firm size is related to resource advantages that support e-business adoption. It is important to note, though, that some previous studies produced mixed results on the effect of firm size on e-business adoption. For example, Askaranya and Mal (2005), Levenburg (2005) and Thompson (2007), and Bordonaba-Juste et al. (2012) have found size to have a significant relationship with adoption of e-business. On the other hand, Oliviera and Martins (2010), Hsu, Kraemer and Dunkle (2010) and Aguila-Obra and Padilla-Mendez (2006) have found contrasting results. The different results can be explained by the fact that size can be measured differently, using number of employees, sales revenue, sales volumes, and so on. Furthermore, the size of the firm can be perceived differently from one country to the other.

Managerial Implications: The study has made a significant contribution by enhancing an understanding of organizational factors that influence the adoption of e-business practices in the context of developing countries. Top management in manufacturing companies in Zimbabwe and other developing countries may utilize the results for this study to plan and create a conducive environment for successful implementation of e-business practices. In terms of research the organizational factors necessary for e-business adoption and implementation may be tested in other developing countries in order to generalize their importance. The findings of the study show that e-business adoption is largely dependent organizational factors. Results show that organizational factors have the highest total variability index or R-squared value of almost 58 %: innovation orientation R-squared=13.74; financial resources R-squared=15.2; size R-squared=16; perceived usefulness R-squared=13.74. Based on these results, the manufacturing firms in Zimbabwe have the opportunity to decide and influence their own future as far as use and adoption of e-business applications is concerned. However, there is also a need to understand the other underlying determinants of e-business adoption of almost 42 percent which are not captured by the proposed model used in this study.

Limitations of the Study: As with any study, this research is not without limitations. First, the sample size is small compared to the number of constructs and proposed relationships. Furthermore, the response rate in some manufacturing categories is low. As such, the results of the study may need to be used with caution due to limited generalizability. The study used a single respondent from each target firm, that is, there was no cross validation of responses from other informants in the same firm. However, targeting senior executives with vast e-business experience was an attempt to minimize this error. The cross-sectional nature of the study restricts the determination of the causality between variables, particularly e-business adoption and sustainable competitive advantage to statistical considerations. A firm's competitive advantage would need a long period of time to be evaluated, considering that e-business technologies have to be learned and adapted to.

5. Conclusion

The primary objective of this study was to identify organizational factors that influence the adoption and implementation of e-business practices in the context of a developing country such as Zimbabwe. The study identified financial resources, perceived usefulness and size of the firm as the main organizational factor that influences the adoption and implementation of e-business practices in Zimbabwe. Lack of information technology resources was identified as the main impediment of the adoption and implementation of e-business practices in Zimbabwe. Given that IT resources play a critical role in the adoption and implementation of e-business practices, there is a dire need for the Zimbabwean government to provide structural support that allows companies to build their information technology infrastructure. To promote mainstream adoption of e-business practices in Zimbabwe, future research efforts may be directed towards understanding other external environmental factors. Additionally, this study may also be replicated in other developing countries with the objective of testing the generalizability of the findings of this study.

References

- Abu Bakar, A. R. (2004). The Antecedents and Consequences of E-business Adoption in Malaysian Manufacturing Firms. Unpublished Doctoral thesis, Aston University, United Kingdom.
- Aguuila-Obra, A. R. & Padilla-Melendez, A. (2006). Organizational Factors Affecting Internet Technology Adoption. *Internet Research*, 16(1), 94-110.
- AMEC. (2013). Opportunities to Business of Improving Resource Efficiency, European Commission Report, 2013, United Kingdom.
- Askarany, D. & Malcolm, S. (2008). Diffusion of Innovation and Business Size: A Longitudinal Study of PACIA. *Managerial Auditing Journal*, 23(9), 900-916.
- Barney, J. B. (1991). Firm Resource and Competitive Advantage. *Journal of Management*, 17(1), 90-120.
- Barney, J. B., Ketchen, D. J. & Wright, M. (2011). The Future of Resource-Based Theory: Revitalization or Decline? *Journal of Management*, 37(5), 1299-1315.
- Becker, M.C. (2006). Innovation Routines- Exploring the Role of Routines in Innovation. ISS Conference, Sophia-antipolis, 22-24 June <http://www.schempeter-2006.org/> Accessed on 4 August 2012.
- Bordonaba-Juste, V., Lucia-Palacios, L. & Polo-Redondo, Y. (2012). The Influence of Organizational Factors on E-business Use: Analysis of Firm Size. *Marketing Intelligence and Planning*, 30(2), 212-229.
- Bromiley, P. (2005). The Behavioral Foundations of Strategic Management, Malden: Blackwell.
- Cardwell, E., Harland, K., Bwell, G. & Zheng, K. (2013). Impact of E-business on Perceived Supply Chain Risk. *Journal of Small Business and Enterprise Development*, 20(4), 688-715.
- Chao, C. & Chandra, A. (2012). Impact of owner's knowledge information technology on strategic alignment and IT adoption in US small firms. *Journal of Small Business and Enterprise Development*, 19(1), 114-131.
- Chitourou, M. S. & Souidan, N. (2010). Rethinking the TAM model: Time to Consider Fun. *Journal of Consumer Marketing*, 27(4), 336-344.
- Confederation of Zimbabwe Industries Report. (2011). State of the Manufacturing Sector: CZI Report, Harare.
- Davis, F. D. (1989). Perceived Usefulness, Ease of Use and User Acceptance of Information Technology. *MIS Quarterly*, 13(3), 319-340.
- Dube, T., Chitura, T. & Runyowa, L. (2009). Adoption and Use of Internet Banking in Zimbabwe: An Exploratory Study. *Journal of Internet Banking and Commerce*, 14(1), 1-13.
- E-Business Watch. (2009). ICT and E-business Impact Studies: ICT for Innovation and Sustainable Economy.
- Eurostat Report. (2013). E-commerce Europe: E-payment Report, Brussels.
- Fillies, C. (2002). Sem Talk: A RDFS Editor for Vision 2000, in Semantic Web Working Symposium, Stanford, USA. www.semtalk.com. Accessed on 10 July 2012.
- Fillis, I. & Wagner, B. (2005). E-business Development: An Exploratory Investigation. *International Small Business Journal*, 23(6), 604-634.
- Foss, N. & Kundsén, T. (2003). The Resource-Based Tangle; Towards a Sustainable Explanation of Competitive Advantage. *Managerial and decision Economics*, 24(4), 291-307.
- Grandson, E. & Pearson, J. E. (2004) E-commerce adoption: Perception of managers/ Owners of Small to Medium Enterprises in Chile. *Communications of AIS*, 1, 81-102.
- Grant, R. M. (1999). The Resource-Based Theory of Competitive Advantage: Implications for strategy formulation. *California Review*, Spring 1999.
- Hinton, M. & Baines, D. (2009) Discovering Effective Performance Measures for E-business. *International Journal of Productivity and Performance Management*, 58(4), 329-345.
- Hong, W. & Zhu, K. (2006). Migrating to Internet-based E-commerce: Factors Affecting Ecommerce Adoption and Migration at the Firm Level. *Information and Management*, 43(1), 204-221.
- Hsu, P., Kraemer, K. L. & Dunkle, D. (2006). Determinants of E-business Use in US firms. *International Journal of E-Commerce*, 10(4), 9-45.
- Huy, I. V., Rowe, F., Truex, D. & Huynh, M. Q. (2012). An Empirical Study of the Determinants of E-commerce Adoption in SMEs in Vietnam an Economy in Transition. *Journal of Global Information Management*, 20(3).
- Kim, Y. & Nam, K. (2007). E-Commerce for Organizational Development and Competitive Advantage. *Journal of Electronic Commerce Research*, 5(3), 153-171.
- Kraaijenbrink, J., Spender, J. C. & Groen, A. J. (2010). The Resource-Based View: A Review and Assessment of its Critiques. *Journal of Management*, 36(1), 349-372.

- Kumar, R. (2011). *Research Methodology: A Step by Step Guide for Beginners*. (3rd ed.). Thousand Oaks, CA: Sage.
- Kundi, G. M. & Shah, B. (2009). IT in Pakistan: Threats and Opportunities for E-business. *The Electronic Journal of Information Systems in Developing Countries*, 36(8), 1-31.
- Levenburg, N. N. (2005). Does Size Matter? Small firms' Use of E-business Tools in the Supply Chain. *Electronic Markets*, 15(2), 94-105.
- Li, P. & Xie, W. (2012). A Strategic Framework for Determining E-commerce Adoption. *Journal of Technology Management in China*, 7(1), 22-35.
- Linder, J. C., Javenpaa, S. & Davenport, T.H. (2003). Towards an Innovation Sourcing Strategy. *Sloan Management Review*, 44 (4), 43-49.
- Liu, L., Madhavani, R. & Sudharshan, D. (2005). Diff Net: The Impact of Network Structure on Diffusion of Innovation. *European Journal of Innovation Management*, 8(2), 240-262.
- Mnzebele, N. (2013). Attitudes of Hotel Managers towards E-commerce in South Africa. *International Journal of Information and Education Technology*, 3(1).
- Morrison, A. J. & King, B. E. (2002). Small Tourism Business and E-commerce: Victorian Tourism online. *Tourism and Hospitality Research*, 4, 104-115.
- Mupemhi, S. & Mafuka, A. (2006). Critical Constraints in the Adoption of E-commerce as a Business Tool in Zimbabwe. *Dyke*, 2(1), 250-264.
- Nguyen, H. O. (2013). Critical factors in e-business adoption: evidence from Australian transport and logistics companies. *International Journal of Production Economics*, 146(1), 300-312.
- Oliviera, T. & Martins, M. F. (2010). Understanding E-business Adoption Across Industries in European Countries. *Industrial Management Data Systems*, 110(9), 1337-1354.
- Park, E., Kim, J. K. & Pobil, A. P. (2012). Towards a Successful Mobile Map Service: An Empirical Examination of Technology Acceptance Model. *Communications in Computer and Information Science*, 293, 420-428.
- Peltier, J. W., Schbrowsky, J. A. & Zhao, Y. (2009). Understanding the Antecedents to the Adoption of CRM Technology by Small Entrepreneurs Vs Owner Managers. *International Small Business Journal*, 27(3), 307-336.
- Penrose, M. A. (1959). *The Theory of Growth of the Firm*. New York: Wiley.
- Peteraf, M. A. (1993). The Cornerstone of Competitive Advantage: A Resource-Based View. *Strategic Management Journal*, 14, 179-191.
- Ramdani, B., Chovers, D. & Williams, D. A. (2013). SMEs Adoption of Enterprise applications: A Technology-Organization-Environment Model. *Journal of Small Business and Enterprise Development*, 20(4), 735-753.
- Rodgers, E. M. (1995). *Diffusion of Innovation*. (4th ed.). New York: Free Press.
- Rodgers, E. M. (2003). *Diffusion of Innovation*. (5th ed.). New York: Free Press.
- Rogers, E. M. (1983). *Diffusion of Innovation*. New York: Free.
- Seabra, C., Abrantes, J. L. & Lages, L. F. (2007). The Impact of Using Non-Media Information Sources on the Future Use of Mass Media Information Systems: The Mediating Role of Expectations Fulfilment. *Tourism Management*, 28, 1541-1554.
- Shi & Yu. (2013). Supply Chain Management and Financial Performance. Literature Review and Future Directions. *International Journal of Operations and Production Management*, 33(10), 1283-1317.
- Simmons, G., Armstrong, G.A. & Dunkin, M.R. (2008). A Conceptualization of the Determinants of Small Business Website Adoption. *International Small Business Journal*, 26(3), 351-389.
- Smith, T. J. & Spiers, R. (2009). Perception of E-Commerce Websites across two Generations. Informing Science. *International Journal of an Emerging Trans-discipline*, 12(1).
- Stephane, T. (2007). Making Sense of the Resource-Based Review? In Proceedings of Academy of Management, Philadelphia. Accessed from <http://eprint.qut.edu.au> on 3 October 2012.
- Sunderan, S., Schwaz, A., Jones, F. & Chin, W. (2007). Technology use in the Frontline. How Information Technology Enhances Individual Performance. *Journal of Academy of Marketing Sciences*, 35, 101-112.
- Teece, D. J., Pissano, G. & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 18, 509-534.
- Thompson, T. (2007). Organizational Characteristics, Modes of Internet Adoption and their Impact: A Singapore Perspective. *Journal of Global Information Management*, 15(2), 91-117.

- Tornatsky, L. & Fleisher, M. (1990). *The Process of Technological Innovation*. New York, NY: Lexington.
- Trochim, M. (2006). *The Research Methods Knowledge Base*. (2nd ed.). Cincinnati: Atomic Dog Publishing.
- Tsokota, T. & Solmes, R. (2013). ICT and the Turning around of Zimbabwean Economy. International Conference on ICT for Africa 2013, February 20-23, Harare, Zimbabwe.
- Tufail, M. S., Muneer, S. & Ishtiaq, M. (2016). Job Characteristics with Task and Contextual Performance: Moderating Role of Procedural Justice for Front Line Managers. *Journal of Social Sciences*, Special Issue, 299-508
- Van Beveren, J. & Thompson, H. (2002). The Use of E-commerce by SMEs in Victoria, Australia. *Journal of Small Business Management*, 40(1), 250-253.
- Wade, M. & Hulland, J. (2004). Review the Resource-Based View and Information System Research: Review Extension and Suggestions for the Future Research. *MIS Quarterly*, 28 (1), 107-142.
- Wang & Sarkis. (2013). Investigating the Relationship of Sustainable Supply Chain Management with Corporate Financial Performance. *International Journal of Productivity and Performance Management*, 62(18).
- Wang, S. & Cheung, W. (2004). E-business Adoption by Travel Agencies: Prime Candidates for Mobile e-Business. *International Journal of Electronic Commerce*, 8(3), 43-63.
- Wee, Y. S. & Quaz, H. A. (2007). Development and Validation of Critical Factors of Environmental Management. *Industrial Management and Data Systems*, 105(1), 96-114.
- Weick, K. E. (2001). *Making sense out of organization*. Oxford: Blackwell.
- Zhu, K., Kraemer, K. L. & Xu, S. (2006b). The process of innovation assimilation by firms in different countries: a technology diffusion perspective on e-business. *Management Science*, 52(10), 1557-1576.
- ZimStat Report. (2013). Zimbabwe demographic survey: 2011-2012. Report, Harare.