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Exploring the Reality of E-Commerce Benefits among South African Businesses

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ABSTRACT

The use of e-commerce by businesses in developing countries is related to the potential benefits of improving linkage to international value chains, increasing market access and reach, enhancing internal and market efficiency and lowering transaction costs. The opportunity imperative has resulted in the adoption of e-commerce by some businesses in these countries. However, the questions of what and how much benefit businesses in developing countries are extracting from their e-commerce investments are not well covered. This paper attempts to explore the real benefits of e-commerce based on data from 92 businesses in South Africa. The findings indicate that e-commerce benefits are by and large limited to improving intra and inter-organizational communications. Strategic benefits such as improving relationships across the value chain, increasing market reach and reducing market, operation and supply chain management costs are not as widely dispersed as the standard model of e-commerce would have made us believe. These findings support the argument that cautions against an over-optimistic view of e-commerce for developing countries.

Keywords: E-commerce, E-commerce benefits, Developing countries, South Africa

1. INTRODUCTION

Many prognoses of e-commerce in developing countries emphasize the opportunities that e-commerce can unveil for firms in developing countries to easily access the global market, strengthen their linkage to global supply chains and the range of cost saving, disintermediation and competitive advantage benefits that would be expected to follow such access (Goldstein and O'Conner, 2000; UNCTAD, 2003).

Others question the feasibility (and general optimism) of e-commerce for developing countries based on untested extrapolations from the experiences of industrialized countries. For instance, Pare (2002) argues that the idea of efficiency gains promised by e-commerce is far-fetched and overlooks the lack of core capabilities. Based on case studies of Chinese organizations, Hempel and Kwong (2001) and Ho and Chen (1999) argue that there is a mismatch between the culture embedded in e-commerce. Odedra-Straub (2003) reinforces the above and opines that the opportunity imperative undermines the resource and local infrastructure realities of developing countries' businesses.

Therefore, understanding what and how much benefits businesses in developing countries are extracting from e-commerce investments is important. This paper aims to explore the real benefit of e-commerce for businesses in developing countries. First, we review the literature on the potential benefit of e-commerce in general and for developing countries in particular. Then, based on data extracted from a survey of South African businesses, we explore the benefits of e-commerce. We finalize the paper by discussing the findings and making some preliminary conclusions.

2. THEORETICAL BACKGROUND

Of the various potential benefits of e-commerce for developing countries argued in the literature, three broad themes can be identified. These are improving linkage and market access, disintermediation outcomes, and improving firm efficiencies.

2.1 Linkage and Market Access

In the era of increased internationalisation of goods, labour and information markets (Wigand et al, 1997), markets and more specifically access to markets remain one of the crucial problems of businesses in developing countries. Especially, with the dominance of global commodity chains, linkage to global supply networks influences not only access to markets but also firm competitiveness (Dolan and Humphrey, 2001; Moodley, 2003).

Information and communication networks have the potential to make location-related constraints less influential and provide a better worldwide access to markets and market information (Wigand et al, 1997). They also facilitate the integration of national trading systems to global systems (Gereffi, 2001). It, therefore, follows that using e-commerce, businesses in developing countries, irrespective of size and location, could overcome the geographical barrier of trading globally and could access markets and supply networks that would have otherwise been impossible to them. As a result existing firms would be able to increase their market 'reach' and new firms would be able to flourish.

2.2 Disintermediation Outcomes

Disintermediation refers to the death (or gradual elimination) of the middleman (the intermediary) from the market value chain as organizations rely on the

potential of electronic networks to establish direct linkages with consumers and suppliers (Wigand and Benjamin, 1995). Although the disintermediation effect of e-commerce on all types of intermediaries and in all types of industries is critically challenged (see for example Bakos, 1998; Sarkar et al, 1995), it is tenable to argue that networks could enable organizations to bypass (even if not to completely eliminate) some, if not all, of the intermediaries and reduce the producer-intermediary or the intermediary-consumer transaction costs.

On the other hand, businesses in developing countries including those in the agriculture sector often depend on long supply chains both to market their products and to purchase required inputs (Dolan and Humphrey, 2001). More often than not, the intermediaries take the lion's share of the profit and they decide which products are to be delivered to the market and from which supplier to purchase equipment and other necessary inputs. They also add to the cost of input materials and finished products. As indicated above, e-commerce can enable producers and/or consumers to bypass some of these intermediaries and/or the costs associated with them.

2.3 Efficiency Gains

One of the costs that significantly affect efficient performance of a business or any other economic activity is the coordination cost (Malone et al, 1989). Coordination costs include costs incurred in coordinating the activities of people and work and the costs of participating in the market (Wigand, 1995; Sarkar et al, 1995). Malone et al (1989) postulate that advances in information and communication networks improve the speed and cost of communicating the same unit of information and enable the design and deployment of strategic linkages among market players. It also facilitates an electronic market place where buyers and sellers easily compare offerings. This, in turn, leads to efficient utilization of resources in coordinating activities and in reduced costs of transaction (Malone et al, 1989). Wigand (1995) relates the above benefits of electronic networks to e-commerce and indicates that through e-commerce organizations would be able to achieve an even cheaper unit cost of coordinating activities.

It has been argued that businesses in developing countries incur high costs in both production and coordination of their economic activities because of inefficient systems of procurement, communication, inventory control and operation (Mann, 2001). Such high costs normally add to the market price of products and affect the competitiveness of most developing countries' products in the global market environment. Therefore, from the notion of the argument pursued above, it follows that through e-commerce, businesses in developing countries would be able to reduce the cost of coordinating the work of people and machines in all

the "information, negotiation and execution phases" (Wigand et al, 1997) of their systems and increase their efficiency. In addition, through e-commerce, firms in developing countries would be able to reduce the transaction costs they would have otherwise incur to participate in international trade and sell their products and services more competitively.

In the remaining part of the paper, we explore to what extent the businesses surveyed in South Africa realized the above-hypothesized benefits of e-commerce.

3. NOTES ON RESEARCH METHODS

The data used in this paper is extracted from a survey response of 150 businesses conducted as part of a doctoral research project. For the purposes of this paper though, the e-commerce capability of the businesses was used as a data extraction criterion. In order to talk about e-commerce benefits, we assumed that the businesses needed to have at least an informational e-commerce capability. As a result, only businesses that have attained an informational or interactive or transactional or integrated e-commerce capability were selected. This has resulted into 92 data subsets.

We drew a set of e-commerce benefit statements from the review of the literature. The respondents were asked to express their degree of agreement about each of the benefit statements on a five point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree). We specifically sought out the CEOs, general managers and managing directors of the organizations to respond to the survey questions. The data were analysed using descriptive and exploratory statistical techniques.

A wide range of demographic characteristics was covered by the data subset. The majority of the respondents (72%) held a job title of managing director or CEO or general manager. The remaining respondents held directorial positions in finance (11%), IT (10%), e-commerce (4%) and marketing (3%). Eighty six percent of the organizations have been in business for more than 10 years. In terms of size (using the conventional measure of employee number), 83% can be characterized as large. Some 58% of the responses were from the manufacturing and services sectors. While the primary sector, i.e., agriculture, construction and mining represents 17% of the responses, trade and tourism and the ICT sectors account for 15% and 10% of the responses respectively.

4. FINDINGS

4.1 E-commerce Benefit Constructs

Exploratory factor analysis was used in order to identify underlying constructs and investigate relationships among the 16 items used to assess e-commerce benefits. The factors were extracted using an iterative sequence

of principal components extraction technique with eigenvalues greater than one. To facilitate interpretability, this was followed by varimax rotation. The criterion used for assigning an item to a factor was a minimum factor loading of 0.5. In addition, single item factors and items with a factor loading greater than 0.5 on two or more factors were excluded from subsequent iterations. The final factor structure with 3 factors containing 12 items was obtained after the third iteration (Table 1). In addition, Cronbach's alpha was counted and the scores were above the accepted level (Cronbach, 1979).

Examination of the results in Table 1 indicates that the first factor with six items accounts for 42.8% of the variance. We labelled this factor as the *market performance* gains of e-commerce and is related to both the linkage and market access and disintermediation benefits of e-commerce. Factor one appears to represent variables that constitute benefits in the downstream of the value chain. Businesses that use e-commerce can potentially increase their market reach and at the same time implement mass customisation strategies to produce products and services that suit the needs and preferences of individual consumers (Fruhling and Digman, 2000). Organizations can also use e-commerce to reengineer the selling and distribution processes and eliminate some of the intermediary activities to develop direct contact with their customers. This allows locking-in of customers, improving their relationship with the business and developing their loyalty. As a result, e-commerce might contribute to increasing the business bottom line and promoting competitiveness (Warrington et al, 2000). The results of our survey (Figure 1) indicate that market performance e-commerce benefits among the South African businesses significantly fall short of the above expectations.

The second factor with two items accounts for 14.7% of the variance and is labelled as *communications* improvement benefits of e-commerce. Kalakota and Whinston (1996) consider communication as one dimension of e-commerce. Use of e-mails, intranets and extranets might help organizations to improve the reach and richness of the information to be communicated. In addition, such networks could improve the speed and cost of communicating the same unit of information and enable the design and deployment of strategic linkages among market players (Malone et al, 1989). Our finding (Figure 1) indicates that this is one area that the businesses seem to reap the most out of e-commerce.

The third factor with four items accounts for 10.66% of the variance. This factor is related to the firm efficiency theme identified in the literature review and is labelled here as the *transaction cost reduction* benefit of e-commerce. Wigand and Benjamin (1995) differentiate between market and hierarchy transactions. While market transactions refer to those that support coordination between multiple buyers and sellers, hierarchy transactions, on the other hand, refer to those supporting coordination within the firm as well as the industry value chain. The items under factor three appear to show hierarchy transaction cost savings. Such savings are expected from reductions in operation costs (such as personnel, rent and order processing) supply acquisition and supplier management costs and improvement on internal processes. However, such benefits of e-commerce appear to have eluded our respondents (Figure 1).

Table 1: E-commerce benefits factor analysis

Variable	Factor Loadings (Varimax raw) (ECbenefit) Extraction: Principal components (Marked loadings are > .500000)		
	Factor 1	Factor 2	Factor 3
Extending firms reach (market)	0.840		
Product/service differentiation	0.846		
Increased customer loyalty and retention	0.809		
Improved revenue	0.596		
Improved competitive position	0.620		
Improved customer relationship	0.733		
Improved internal communication		0.859	
Improved external communication		0.906	
Improve process speed			0.588
Reduced operation cost			0.735
Reduced cost of purchasing and procurement			0.833
Improved supplier relationship			0.736
Eigenvalue	5.142	1.768	1.280
Total Variance explained %	42.85	14.73	10.66
Cronbach's Alpha	0.87	0.71	0.78

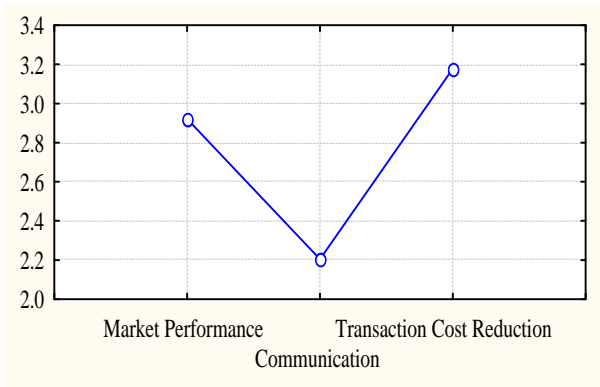


Figure 1: Status of E-commerce Benefits

The three factors extracted above demonstrate some relationship (Table 2). Particularly, there is a relatively stronger correlation between market performance and transaction cost reduction. This implies that if a business is not successful in reducing transaction costs, then it is unlikely for that business to perform better in the market, which means it would find itself at a competitive disadvantage.

Table 2: Correlation coefficients

	Correlations (Ecbenefit)		
	Market Performance	Communication	Transaction Cost Reduction
Market Performance	1.00	0.29	0.54
Communication	0.29	1.00	0.35
Transaction Cost Reduction	0.54	0.35	1.00

4.2 Impact of Demographic Variables

To explore differences of e-commerce benefits in small and medium and large enterprises, the mean score values of the three factors were plotted (Figure 2). Examination of Figure 2 indicates a more or less similar pattern. In both small and medium and large organization groups, improvements in internal and

external communications are reported by most organizations while cost reduction and market performance benefits remain the least experienced. The graph also indicates a relatively better e-commerce benefit for small and medium enterprises in the first two factors, i.e., market performance and communications. The significance of this difference is further tested using a one-way ANOVA. The result (*Wilks lambda*=0.967, $F(3, 83)=0.9573$, $p=.417$) indicates that the difference is not statistically significant.

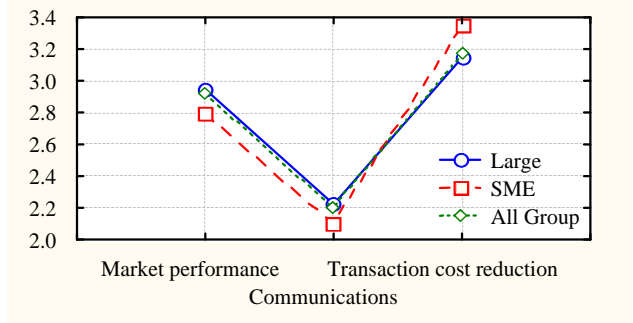


Figure 2: E-commerce benefits by business size

In addition to size, we tested if businesses belonging to different sectors demonstrate variations in terms of e-commerce benefits. The sector wise mean benefit scores are plotted in figure 3. The result has not produced a single pattern indicating one particular sector benefiting more from e-commerce than other sectors. The ANOVA test (*Wilks lambda*=0.88446, $F(12, 211.95)=0.83895$, $p=0.61022$) with no statistically significant result has reinforced this finding.

We anticipated the e-commerce capability of businesses to have some impact on e-commerce benefits. The mean plot (Figure 4) appears to indicate a clear distinction in terms of benefits between businesses with informational e-commerce capability and those that have developed integrated e-commerce capability. As anticipated, businesses that have developed an integrated e-commerce seem to have reported greater benefit from their e-commerce investment in all the areas. However, the ANOVA and discriminant function analysis tests did not produce statistically significant results showing the effect of e-commerce capability on the benefits of e-commerce.

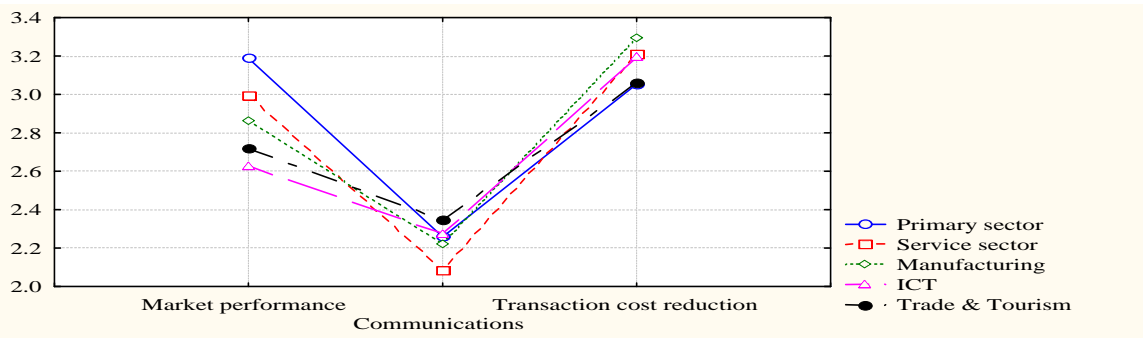


Figure 3: E-commerce benefits by sector

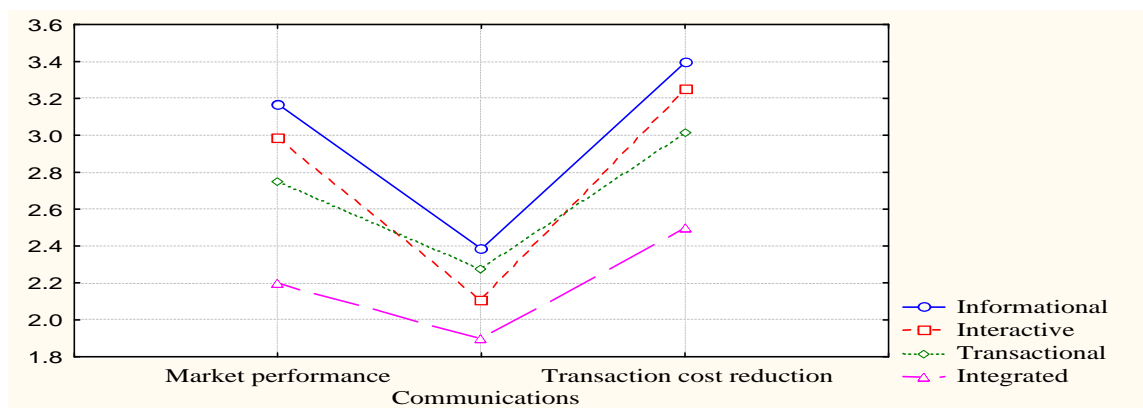


Figure 4: E-commerce benefit by e-commerce capability

5. DISCUSSIONS AND CONCLUSION

Our findings about the benefits of e-commerce for businesses in South Africa appear to contradict most of the themes outlined in the theoretical background section. They also appear to contradict to the buoyant optimism surrounding e-commerce's potential for developing countries. The majority of the businesses do not appear to have obtained e-commerce benefits in terms of expanding their market reach, improving their competitive position, and improving relationships with customers and suppliers. Cost reductions due to savings from improved internal processes and operations have not been as widely found as the standard model of e-commerce would have made us believe.

The results of the study reinforce many of the empirical findings of previous research on e-commerce in developing countries. For instance, Moodley et al (2003) based on a study of garment exporting firms in South Africa found that e-commerce has neither allowed those firms to by-pass middleman nor reduce trade coordination and transaction costs. Pare (2003) analysis of 117 B2B e-hubs discovered that neither are the e-hubs providing services that contribute towards transaction cost reduction nor are the businesses participating in those hubs reaping such benefits. Humphery et al's (2003) findings on the garment and horticulture industries of selected developing countries also suggest that many potential benefits relating to transaction facilitation and reach did not apply to the businesses they interviewed.

One variable that might have affected our results and perhaps the results of many other developing countries focused e-commerce studies is the embryonic nature of e-commerce there. Zhu and Kraemer (2002) have found a strong and significant relationship between the richness of e-commerce capability in terms of information, transaction, interaction and customisation and supplier connection and its value and impact on business performance. The majority of the businesses in our survey (68%) could be categorized as having an entry-level (informational and interactive) e-commerce

capability with only 26% and 6% achieving a transactional and integrated e-commerce status respectively. This is consistent with findings from Brazil (Tigre, 2003), China (Tan and Ouyang, 2004), Malaysia (Le and Koh, 2002) and South Africa (Moodley, 2003). Such capabilities would most likely support the conduct of basic communicational and informational but not transactional activities, hence limiting the extent of e-commerce benefits.

Further, the experience of developed countries suggests that at the early stage of e-commerce there was a significant gap between its anticipated and actual achievements (Marshall et al, 2000). The NNI (1999) supports this and suggests that expecting cost savings from e-commerce instantly is not realistic because benefits might take a long time before they actually materialize. In developing countries in particular, the marginal cost of adopting e-commerce tends to be much higher than in other environments. This is because adopting e-commerce requires additional investments to put in place basic automation and informatisation systems and business networks. Hence, in the short term, e-commerce might add to the transaction cost further delaying the realization of cost saving benefits.

Mansell (2001) and Patterson and Wilson (2000) argued that the capacity of DC businesses to achieve perceived benefits of e-commerce is dependent on their ability to reduce many facets of technological divides and improve the institutional arrangements that support the conduct of business. Likewise, elsewhere, we found that the e-readiness of developing countries' businesses to have significant impact on e-commerce success (Molla, 2004). In particular, we showed that the e-commerce governance model organisations put in place, senior management commitment, and human, business and technological resources all influence marketplace and cost saving benefits.

The findings documented above have some further implications. Many businesses in developing countries are encouraged to adopt e-commerce in order to take full advantages of this new business platform. The result

of this current study provides researchers and practitioners with initial guidance that can be used to manage expectations of returns on e-commerce investments. It also extends previous findings that caution against the over-optimistic view of e-commerce both in terms of organisation-specific gains and contributions to socio-economic development. Particularly, it indicates that entry-level e-commerce applications are unlikely to generate the potential benefits hypothesized in the literature. Rather, what is implied here is that, the capacity of developing country businesses to achieve the perceived benefits of e-commerce requires building up their internal organisational capabilities. It also requires improvements in the richness of e-commerce sites on all informational, transactional and interactive dimensions and the institutional arrangements that affect its conduct. The study also provides researchers with an initial set of factors and items that could be used in future research. This would facilitate an understanding of the antecedents and outcomes of e-commerce in developing countries.

To summarize, our result shows significant shortfall from the optimistic view of e-commerce. However, it is not tenable to extrapolate from this and make sweeping generalizations about either e-commerce in South Africa or the wider developing countries context. In fact, this current study is limited in terms of its sample coverage in both geographic and size terms. In addition, the results we observed here are likely to change in the future as businesses in developing countries accumulate experience and improve their organizational and e-commerce capability. Hence, in order to better understand the e-commerce phenomenon in developing countries, further research that expands both the geographic and sample size coverage of our research is recommended. Research is also recommended that not only assesses the benefits but also the antecedents that affect those benefits.

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