

Impact of Electronic Commerce on Small Exporting Firms in the South African Wooden Furniture Manufacturing Sector

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Abstract

The paper argues that business-to-business (B2B) electronic commerce may create new opportunities for South Africa's small wooden furniture producers (SWFPs) to participate in international trade. However, e-commerce is not a substitute for a full, systematic export strategy. Moreover, the mere application of, and access to, e-commerce technologies is not likely to enable a reduction in overall transaction costs that is sufficient to facilitate entry into new global markets for SWFPs. It is important for policymakers to bear in mind that digital trading relationships depend not only on sophisticated information and communication technologies (ICTs), but also complementary support services such as efficient logistics, payment and certification systems. Survey findings suggest that there is a dissonance between what the firms consider to be the expected benefits of B2B e-commerce and their own implementation and use of B2B applications. There are two main reasons for their inaction: (1) their inability to develop an apposite e-commerce model which is tightly integrated into their respective value chains; and (2) the formidable, unanticipated barriers impeding their progress to a functional e-commerce system. The policy challenge is to create an enabling and nurturing environment aimed at promoting and accelerating the diffusion of e-commerce technologies and strategies among South Africa's SWFPs.

Keywords: corporate Internet use, electronic commerce, wooden furniture producers, exporting, small enterprises, global connectivity, South Africa

Introduction

The potential of the internet and its associated technologies to enable global e-commerce has been widely documented in scholarly publications (Cronin, 1996; Lee & Clark, 1997; Montealegre, 1999; Press, 1996; Weingarten, 1994). The primary emphasis in much of the current debate about electronic commerce is on the global nature of electronic markets, and the lower costs of reaching global markets (Montealegre, 2000; Steinfield et al., 1999; UNCTAD, 2001). Internet-based market structures, and more broadly, the extension of global telecommunication networks,

appear to offer producer firms in developing countries new exchange mechanisms that will enable them to compete on a more equal basis in world markets (Goldstein and O'Connor, 2000; United Nations, 2000).

It has been claimed that B2B e-commerce has the potential to reduce information asymmetries and trade-related transaction costs, provide the firm with an international profile and eliminate market barriers inhibiting the growth of developing country exports (Benjamin & Wigand, 1995; Malone & Laubacher, 1998). The question that arises is: are the opportunities offered by the internet and e-commerce being translated into actual benefits for small firms in developing countries? Several recent studies, however, have challenged assertions about the potential for e-commerce to increase the scope for international trading (Chircu & Kauffman, 1999, 2000; Kraut, et al., 1999; Steinfield, et al., 1995, 2000). It has been argued that the small firm may not have the business systems in place to serve distant customers adequately, even if it does attract them. The ability to process electronic orders, verify payments, ship to distant customers, handle returns, etc. need to be acquired. The purpose of this paper is to assess the extent to which e-commerce has the capacity to assist South African small wooden furniture producers (SWFPs) to secure improved access to international markets.

Small enterprises (SEs) and entrepreneurship are receiving a great deal of attention in South Africa as a result of concern about national economic performance; the slow and uneven pace of black and gender-based economic empowerment; widening growth disparities; high levels of unemployment; and intensive industrial restructuring, including the rationalization and downsizing of large firms, as well as the outsourcing of more functions to SEs (Department of Trade and Industry, 1995). Policymakers are raising questions about whether information and communication technologies (ICTs) can strengthen the long-term, sustainable growth performance of SEs in South Africa. Concomitantly, the critical importance of e-commerce for enabling SEs to gain improved access to international markets has recently come under the policymaking spotlight (Department of Communication, 2000; Department of Trade and Industry, 2001).

Increasingly international wooden furniture buyers are using the internet to transform the way they do business and in which they collaborate with trading partners. In particular, many of them are using the internet to trade online and to develop close knowledge-based links with suppliers. E-commerce technologies are, in turn, becoming increasingly important for South African SWFPs as they are integrated into global value chains and exposed to the demands of more sophisticated markets. SWFPs are likely to benefit from low cost access to the global marketplace which was previously only open to major companies with a global marketing and distribution infrastructure.

Unlike large enterprises, many of which already operate in global markets through well-established networks of affiliates, the export potential of SWFPs have been constrained because of their small size, lack of resources and limited ability to identify and work with new customers and suppliers across borders. The internet eliminates these disadvantages by opening up global markets to SWFPs with an effective strategy for conducting business online. Reduced transaction costs, lower barriers to market entry and improved access to information are likely to reduce the

economically optimal size of firms, thereby encouraging smaller firms to work together to develop global market reach (Panagariya, 2000).

The objective of the paper is to provide a preliminary analytical foundation to help focus the policy debate. The discussion that follows is based on insights gleaned from an exploratory, qualitative fax-based survey of South African small wooden furniture producers (SWFPs) that are currently exporting. The survey was undertaken by the author between January and March 2001. The author identified 105 exporting SWFPs listed in the South African Wooden Furniture Directory (2000), and faxed a short questionnaire and cover letter to each firm. Completed questionnaires were received from 64 firms (a response rate of 61 percent). In addition, the author conducted face-to-face interviews with 19 industry experts drawn from academia, government, trade unions, employers' associations, the South African Furniture Export Council, and business, marketing and IT consultancies. The objective of the pilot survey and the interviews with experts was to gauge how significant the use of business-to-business e-commerce is for supporting the export activities of SWFPs, to shed light on the factors that limit the extent to which SWFPs participate in international B2B e-commerce, and to find out whether SWFPs perceive B2B e-commerce as being beneficial to their businesses.

The paper is organized as follows. In Section II the conceptual framework adopted for the study is set out. Section III provides a brief state of the industry review of the South African wooden furniture sector. The key findings that emerged from the exploratory e-commerce survey of South African small wooden furniture exporters are summarized in Section IV. Section V sets out the policy challenge, and Section VI concludes the study.

Electronic Commerce and Access to Global Markets

While business-to-business e-commerce forecasts vary, researchers agree that it is growing rapidly and that it constitutes between 80-90% of total e-commerce transactions globally (Mansell, 2001; UNCTAD, 2001). The author defines B2B e-commerce as any form of commercial or administrative transaction or information exchange that takes place between firms via an internet-based, computer-mediated network. B2B e-commerce can be divided into two categories: open marketplace-based trade and direct trade between business partners. The former takes place at various internet-based auctions or trading exchange sites, whilst the latter occurs either through a firm's website which has an online purchasing function or an electronic data interchange (EDI) network. B2B e-commerce enables buyers in developed countries to have easier access to information about developing country producers; and it advances the ability of developing country suppliers to obtain knowledge of buyer requirements in developed countries. One of the major advantages of an e-commerce environment is that it can bring an offer to the attention of many more players than would be possible without the use of the internet.

Advances in performance and cost efficiency of hardware and software, computing power, data storage and data transmission bandwidth (i.e., communications capacity) are linked to the rise of e-commerce (King, 1999; April & Cradock, 2000). The convergence of data processing, telecommunications and automation opened up possibilities for integration and inter-organizational information processing (Earl, 1988). As a result, companies facing global competition started to look towards technology to drive down costs, improve performance, be

more flexible, and overcome time and space constraints. But it was the widespread diffusion of internet applications in the 1990s which provided the impetus for global e-commerce transactions.

Electronic data interchange (EDI) services, the first applications of e-commerce, were aimed at automating pre-existing relationships between suppliers and corporate customers, mostly in support of the procurement function of manufacturing industries (Sokol, 1989). Since its inception more than 20 years ago, EDI has hardly met the promise of a technology that proposed to generate significant gains in productivity. Arguably, one of the causes of this disappointment was the absence of common standards for EDI despite the numerous but ill-coordinated attempts by governments and industry coalitions to agree on protocols. The internet's open infrastructure has lifted this constraint, yielding new prospects for a spectrum of electronic transactions involving not only economic agents with existing trading relationships but also companies attempting to develop new commercial links. This is a significant development for SWFPs in that current EDI systems are the domain of larger companies since the cost of the customized software and technical coordination is far too high for smaller businesses.

Viable B2B trading exchanges and portals, such as the Global Trading Web (GTW) and the Global Trade Point Network (GTPN), hold promise for SWFPs to tap into international procurement systems, which have the potential to save them high marketing and market development costs and provide them with improved market penetration. Internet-based trading exchanges or hubs are likely to become the primary e-commerce trading platform for developing country producers (Garicano & Kaplan, 2000; Kaplan & Sawhney, 2000; UNCTAD, 2001). The trading hubs, however, will only reduce transaction costs and facilitate international exchange if information provision is complemented by services that give buyers and sellers a low-cost means of acquiring confidence that transactions will be completed successfully (Timmers, 1999). These complementary services include payment/settlement mechanisms, insurance, logistic systems, inspection, certification of quality, and customs clearance, and are crucial for trade between producers in developing countries and buyers in developed countries. The bottom line is that without low cost access to such services, developing country producers might find it prohibitively expensive to arrange payment and the transportation of products. A major shortcoming, however, is that the kinds of transaction-related support services currently available at online trading platforms are more limited in their scope and functionality than is often assumed in the literature on e-marketplaces (see Raisch, 2001; Sculley et al., 2001).

In addition, transactions would be facilitated by the provision of services such as the screening of potential trading partners, the provision of secure payment systems, certification of parties with regard to aspects such as quality and environmental standards, verification of the accuracy and relevance of the information provided by trading parties, and the inspection of products offered for sale. The direct or indirect provision of these services might be particularly important for B2B e-commerce across national boundaries because information asymmetries (about both firms and their products) are likely to be higher, and other means of redress less effective and more expensive (Maitland, 2000). Therefore, B2B trading exchanges may serve to increase the opportunities for developing country firms to conduct trade internationally, but the extent to which this will occur is a matter for empirical verification, and is outside the scope of this paper. The real impact of trading exchanges for small firms in developing countries has yet

to be fully articulated and demonstrated. Many of the trading hubs are still in their formative stages and therefore have yet to provide sufficient data for study. In part, data on transactions in B2B trading hubs tend to be inadequate since the final details of such transactions, including prices and transaction volumes, may not necessarily be known to the marketplace. This arises partly from the fact that some transactions initiated online are completed offline.

The mere application of, and access to, technologies such as the internet and the World Wide Web is not likely to enable a reduction in overall transaction costs that is *sufficient* to facilitate entry into new global markets by developing country producer firms. B2B e-hubs will need to offer, or at least make available, packages of complementary services. This notwithstanding, it would appear that e-commerce is a necessary but not sufficient condition to reduce the transaction costs associated with trading in international markets. The failure to consider the barriers to adopting e-commerce can lead policymakers to overestimate the potential savings while underestimating the new costs that firms in developing countries may experience as a result of participating in electronic transactions. Having said that, the recent UNCTAD (2001) e-commerce survey of small and medium enterprises in developing countries has highlighted the achievements of dynamic entrepreneurs that found ingenious solutions to bypass traditional obstacles to international trade.

South African Small Wooden Furniture Producers in Transition

The South African wooden furniture production sector (WFPS) is dominated by small firms (Table I). Since 1994, the WFPS landscape has been substantially altered by the twin pressures of globalization and trade liberalization. This is partly attributed to South Africa's increasing integration into the global economy following the country's first democratic elections in 1994. This process of global integration has been accelerated through the Government's Growth, Employment and Redistribution (GEAR) strategy, which was implemented in 1996 in the wake of a currency crisis. GEAR follows orthodox economic ideas focused on fiscal austerity and the promotion of trade liberalization, leading to increasing international competition, along with increasing opportunities for exports (Habib and Padayachee, 2000). The key challenge thus confronting SWFPs is not *whether* to participate in global processes, but *how* to do so in ways which provide for sustainable growth.

TABLE I: South African Wooden Furniture Producers by Size of Firm

Firm Size	No of Employees	No of Plants	Percent of Plants
Micro	1 to 4	261	17.9
Small	5 to 49	998	68.4
Medium	50-199	158	10.8
Large	≥200	43	2.9

Source: Dunne 2000

There are several reasons for shifting the focus to export markets. Firstly, the local market is small, making it difficult to sustain economies of scale. Secondly, furniture is a consumption good and in a developing country like South Africa which has a depressed construction and building industry, high structural unemployment, a sluggish economic growth rate, and high

levels of poverty and inequality, the potential for growing the domestic market in the short-term is not great. Therefore, the higher volumes and higher prices offered by the export market offer a superior growth trajectory for SWFPs.

The main export destinations for South African wooden furniture products are the UK and Germany, and to a lesser extent Australia, the Middle East, USA and other countries in Western Europe. With the possible exception of the Middle East, these are export markets with high levels of e-commerce penetration. It is clear, therefore, that South African SWFPs are competing in export markets characterized by knowledge-driven economies with sophisticated IT infrastructures, high internet connectivity penetration, increased availability of broadband connectivity, improved online security and increased willingness to buy and sell over the internet.

TABLE II. Trade and Employment Data for South Africa 1995-1999 (1997 Figures)

Industry	Number of Employees	Annual Change in Employment (%)	Annual Change in Exports (%)	Exports (US\$m.)	Imports (US\$m.)	Product-ion (US\$m.)	Annual Change in Export Openness (%)	Wage Per Head (US\$)	Annual Change in Wage Per Head (%)	Annual Change in Productivity (%)
Total Manufacturing	1436430	-0.2	6.9	14919	21688	73132	5.9	9550	2.9	1.2
Textiles	70210	-3.6	5.0	426	693	2396	6.5	6429	3.2	2.1
Footwear	23310	-1.3	10.3	17	158	478	11.3	4710	1.9	0.3
Apparel	126280	0.2	10.5	166	200	1714	9.0	4575	3.2	1.3
Furniture	50570	2.9	20.2	409	91	1027	19.1	6452	1.6	-1.9

Source: Calculations based on data from the International Trade Center (www.intracen.org)

TABLE III. Net Exports Data for South Africa 1995-1999 (US\$'000)

Selected Product Groups	Gross Export Value 1998	Net Export Value 1995	Net Export Value 1998	Net Export Percent Change 1995-98
Furniture	447,176	330,507	365,895	10.7
Footwear	15,761	-154,585	-153,780	0.5
Apparel	150,809	17,321	-38,995	-225.1

Source: Calculations based on data from the International Trade Center (www.intracen.org)

According to Table II, furniture accounted for 3.5 percent of total manufacturing employment and 2.7 percent of total manufacturing exports between 1995 and 1999. Of the labor-intensive sectors, furniture is the highest net exporting sector and has the best exporting performance figures between 1995-99 (Table III). Exports in furniture sales grew from less than 5 percent in 1992 to over 40 percent in 1999 (Kaplinsky, Morris & Readman, 2001). This exceeded the export/sales ratio in the South African manufacturing sector as a whole. The WFPS is therefore important for South Africa in terms of employment, its contribution to economic growth and to exports.

TABLE IV. World Furniture Trade - The 20 Leading Net Exporting Countries (US\$'000)

Country	Gross Export Value 1998	Net Export Value 1995	Net Export Value 1998	Net Export Percent Change 1995-98
1. Italy	8,630,577	7,595,051	7,831,184	3.1
2. China	2,821,435	1,670,459	2,725,244	63.1
3. Canada	4,254,850	684,846	1,805,593	263.6
4. Poland	1,909,699	1,179,853	1,563,564	132.5
5. Denmark	2,022,567	1,686,785	1,323,069	-21.6
6. Mexico	1,841,054	467,702	1,190,136	254.5
7. Malaysia	1,113,788	825,857	1,050,869	127.2
8. Spain	1,476,699	522,492	731,090	139.9
9. Thailand	629,261	711,506	609,308	-14.4
10. Czech Repub.	854,524	147,833	499,274	337.7
11. Sweden	1,341,673	509,901	494,747	-3.0
12. Slovenia	565,421	340,720	432,703	127.0
13. Romania	435,571	471,857	382,337	-19.0
14. South Africa	447,176	330,507	365,895	10.7
15. Indonesia	355,065	818,946	339,028	-58.6
16. Philippines	324,620	235,055	271,453	15.5
17. Hungary	430,546	79,523	228,092	286.8
18. Brazil	342,881	211,936	135,197	-36.2
19. Korea Repub.	187,803	-34,165	76,515	4235000.0
20. Slovakia	195,571	143,155	63,423	-55.7

Source: Calculations based on data from the International Trade Center (www.intracen.org)

In 1998, the furniture industry was the 19th largest traded goods sector, with a total value of world trade of US\$44.9 billion, surpassing the value of trade in the apparel industry (US\$40.6 billion) and the footwear industry (US\$33.8 billion). Between 1994 and 1998, all world trade grew by 16 percent, whereas world trade in the wooden furniture industry grew by 26 percent (www.intracen.org). To put this growth in context, the other two low-tech sectors, that is apparel and footwear, grew by 18 percent and two percent respectively during the same period. Competition in the global furniture industry has intensified in recent times with the increasing penetration of industrialized country markets by developing countries (mainly from Asia) and the former command economies of Central and Eastern Europe (Table IV). Table IV clearly illustrates this trend: there are only five industrially advanced economies in the list of the top 20 net exporting countries. South Africa is positioned at number 14.

Theoretically, the internet provides South African furniture manufacturers with the requisite connectivity to become a global player through world-wide marketing and sourcing. E-commerce represents a major opportunity for SWFPs to compensate for their traditional lack of access to international markets. The improved transaction efficiency and reduced communication and information costs of the internet offer opportunities to small producers for extending their global reach.

Key Findings

The SWFPs indicated that their primary business concerns are the threat of competition (73%), the need to control costs (94%) and the difficulty of finding new trade opportunities in mature markets (77%). Thus it would seem that SWFPs have much to gain from adopting and using internet-based e-commerce applications. The findings, however, reveal that internet penetration among SWFPs is only 59%. The main uses of the internet by SWFPs include: email applications (100%); monitoring prices (55%); keeping abreast of technology and market trends (47%); information searches (47%); accessing commercial databases or services (39%); checking supplier financials (32%); and, to a lesser extent, actual transactions between firms (16%). The main advantages SWFPs associate with e-commerce are: reaching new markets (83%); reducing transaction costs (83%); optimizing business processes (63%); improved customer service (i.e., customer support and after sales) (50%); and strengthening customer relationships (50%).

Currently, only 27% of SWFPs have corporate websites, which are used primarily for advertising and marketing. The vast majority of SWFPs (95%) have not registered with global B2B e-commerce marketplaces, nor have they attempted to arrange or initiate electronic transactions with firms located in other countries. However, 72% of the SWFPs mentioned that they are listed on one or more internet-based business directories. This means that a substantial proportion of SWFPs have some sort of international profile, albeit quite limited and static. It would appear that the SWFPs are using internet-based applications such as email primarily to facilitate data exchange with existing and new suppliers and customers, but not to support new transactions. Nonetheless, 45% of SWFPs mentioned that they plan to join at least one global trading hub within the next 12 months, 50% indicated that they plan to set up a corporate website within the next 1-2 years, and 61% projected that will engage in e-commerce transactions within the next 1-2 years. As discussed in Section II, the types of exchange structures that are supported, the support services available and the types of information that is available to user firms are likely to influence the decision by buyers and sellers alike to engage in B2B trading hubs.

Making the transition to e-commerce will not be easy, as there are formidable, often unanticipated, obstacles that need to be overcome. These include:

- Limited understanding among SWFPs of the e-commerce concept;
- Evolutionary path dependencies which focus on the reduction of labor and input costs as competitive advantage rather than pursuing a knowledge and innovation-intensive growth trajectory;
- Management's 'laager' mentality which have locked firms into an insular, inwardly-oriented way of thinking;
- The lack of adequate e-commerce infrastructures, skills and capabilities. Many firms do not have the expertise to develop their own online strategy in terms of marketing, website development and back-end processing;
- High costs of internet connectivity;

- Security issues concerning payments;
- Uncertainty concerning contracts, terms of delivery and guarantees. The decision to participate in an electronically mediated transaction is likely to be influenced by concerns about security and trust (reputation);
- The relatively high initial investment costs involved in developing e-commerce strategies. That said, it is becoming easier to link up with existing marketplaces and exchanges via internet browsers. The major problem faced by SWFPs is the lack of internal IT-driven systems to match the demands that will be placed on a company joining an exchange or marketplace.

The impact of e-commerce on small wood furniture exporters, thus far, has been limited. This is not surprising considering that e-commerce is still in an embryonic stage of development in the South African wooden furniture manufacturing sector. Currently, the internet is used primarily for intra- and inter-firm communication and for marketing and lead generation, rather than for inter-business transactions. The findings clearly indicate that B2B e-commerce development among the SWFPs is still evolving.

The survey findings suggest that there is a dissonance between what the firms consider to be the expected benefits of B2B e-commerce and their own implementation and use of B2B applications. It would appear that while the SWFPs are generally familiar with some of the gains of B2B e-commerce, especially those which have received the most publicity in the popular business press, they do not appear to be in any great hurry to adopt e-commerce business models. There are two main reasons for their inaction: (1) their inability to develop an apposite e-commerce model which is tightly integrated into their respective value chains; and (2) the formidable, unanticipated barriers impeding their progress to a functional e-commerce system.

Suggestions for Policy Action

Existing research on IT transfer to developing countries has recognized the need to develop a skilled workforce (Bhatnagar, 1992; Vreede et al., 1999); to learn from the mistakes of other countries (Nilen, 1984); to develop national IT policies (Bhatnagar & Odreda, 1992; McFarlan, 1992); to use proven technologies (established versus leading edge) (Munasinghe, 1989; Munasinghe et al., 1985); and to employ experts or develop international partnerships to import expertise along with the technology (Palvia et al., 1992). These policy issues are all relevant for the South African SWFPs. In addition, policies geared towards reducing the 'digital divide' and putting in place institutional arrangements to support commercial activities are needed (Mansell, 2001).

The policy challenge is to create an enabling and nurturing environment aimed at promoting and accelerating the diffusion of e-commerce technologies and strategies among South Africa's SWFPs. The responsibility of the South African government is to ensure that SWFPs are not marginalized by developments in e-commerce, the global information economy and the internet. There are three main policy challenges:

1. The physical e-commerce infrastructure which addresses the physical environment needed for an enterprise to carry out an e-commerce strategy. This would include internet-related services, telecommunications and electronic payment systems;
2. The policy and regulatory environment which addresses those policies or regulations which most hinder enterprises from engaging in e-commerce; and
3. Institutional and human resources which address the national skills base and resources and development capabilities necessary for enterprises engaging in e-commerce strategies.

The South African government has identified e-commerce, the creation of a knowledge economy and an export-oriented growth trajectory as being critical elements of international manufacturing competitiveness (Department of Communication, 2000; Department of Trade and Industry, 2001; Kaplan, 2000). The missing link however are policies specifically designed to provide an incentive to industry to take advantage of e-commerce opportunities. Government could, for example, adopt e-commerce type solutions for trade-related services such as port and customs clearance in order to improve trade facilitation. By enabling paperless trading, government will play a major role in assisting exporters in becoming e-commerce ready. Enterprise and industry-level incentives for applying e-commerce strategies could include special tax, training and investment incentives, the establishment of 'technoparks', and the provision of special access to finance.

Developing human resources and technical capacities will entail a combination of education and training initiatives. Government will need to become actively involved in developing training courses and workshops on e-commerce for SWFPs. The establishment of a center to provide comprehensive information, advice and training on business usage of the internet as well as support services for the establishment of e-commerce activities is of critical importance. Training and skill formation should be carried out in conjunction with business and industry associations and with consortia of small firms in order to gain economies of scale in developing and delivering training services.

A policy priority is to liberalize the highly regulated and concentrated South African telecommunication market and promote competition in order to stimulate new investment, increase demand for communications access and services through falling prices, and promote greater efficiency and innovation in the provision of infrastructure and services. Policy initiatives to lower network infrastructure costs and internet access charges for SWFPs are important. This is likely to provide a stimulus to the growth of e-commerce among SWFPs. In the OECD (1999) countries, for example, the availability of affordable access to high-speed telecommunication infrastructure is closely linked with firm migration to e-commerce.

The magnitude of the e-commerce challenge is such that there is a need for various public-private and multi-partnerships, alliances and consortia to build and manage coalitions that leverage resources and capabilities across organizations. There is an urgent need for the forging of partnerships to: (1) develop e-commerce solutions and systems which are tailored to SWFPs; (2) assist SWFPs to access capital for their e-commerce ventures; and (3) encourage small firms to form networks and clusters in order to share knowledge, reduce the average costs of their input

transactions, and increase their relative market power in e-commerce transactions. Close coordination and effective collaboration between the different stakeholders is essential if scarce resources are to be efficiently deployed.

Conclusion

The issue of engaging more openly in global production and trade networks has become central to debates on how formerly inwardly-oriented industrial sectors restructure themselves to maintain competitiveness in a more open, trade-liberalized environment (Nadvi, 1999; Schmitz, 2000). Detailed empirical research on trade in labor-intensive products have shown that access to developed country markets has become increasingly dependent on linking into the global production networks of lead firms situated in highly industrialized countries (Dolan & Humphrey, 2000; Gereffi, 1999; Schmitz & Knorringer, 2000). E-commerce has the potential to play an instrumental role in establishing and sustaining global linkages and in so doing, provide a lever for SWFPs linking into export markets. Inter-firm e-commerce capabilities are important for SWFPs as they are struggling to compete in a globalized and interconnected world which is organized around electronic transactions, knowledge and information flows. The transition to an integrated internet trading system will, however, not be easy. It is very much a long-term project which will require a great deal of commitment from the different stakeholders.

A recent survey carried out by Dewan and Kraemer (1998) reveals that together with investment in information technology, there is a need to ensure that organizations have the capacity to restructure themselves to promote efficiency and effectiveness. Small wooden furniture producers (SWFPs) need to rethink their current organizational and technological infrastructures. A dynamic, integrative e-commerce strategy needs to be considered. Moreover, SWFPs will need to have a clear business strategy and not just 'jump on the e-commerce bandwagon'. The e-commerce strategy must be aligned with the firm's overall corporate and business strategy. There is no such thing as a 'one size fits all' pre-packaged e-commerce solution. Investments in e-commerce needs to be made on the basis of an understanding of the firm's needs, its organizational capabilities and resources, and its environment.

The challenge for SWFPs is to: (1) gain a critical understanding of e-commerce; (2) design an appropriate IT architecture which takes into account external demands as well as resource-based, internal sources of competitive advantage; (3) align business plans and resources with IT; and (4) develop the capability to exploit ICTs through careful planning and design of the architecture. A modular, phased migration path to e-commerce capability is probably the most prudent strategy for SWFPs to adopt. SWFPs should embark on modular experimentation, i.e. building systems as small initiatives in order to get the best return on investment. As success with the modular prototype grows, SWFPs can start building more 'modules'. For example, SWFPs may target global audiences through a simple website for marketing purposes, and email for communication, with online ordering and online payment capabilities added on at a later stage. According to Downes and Mui (1998: 201):

"In the uncertain business environment of the digital frontier, real world evaluation of digital strategy prototypes is often the only means of testing and ensuring business value".

For SWFPs, e-commerce may create new opportunities to participate in international trade. However, e-commerce is not a substitute for a full export strategy. Even though e-commerce offers SWFPs new opportunities to compete, because it has the potential to reduce transaction costs, barriers to entry and promises new, affordable opportunities to build brand names, their e-commerce models must be adapted to their competitive strengths and not just replicate the approaches of the larger, more powerful firms. If a small enterprise tries to compete with a large firm simply by making a large investment in powerful equipment for its website, the chances are that its productive and/or distribution capacity will never allow it to recover the costs.

While no-one can predict with absolute certainty how the e-commerce paradigm will unfold and what its eventual truths will be, one thing for certain is that it is poised to transform international trading relationships. However, the mere application of, and access to, e-commerce technologies is not likely to enable a reduction in overall transaction costs that is *sufficient* to facilitate entry into new global markets by SWFPs. It is important for policymakers to bear in mind that digital trading relationships depend not only on sophisticated ICTs, but also complementary services such as efficient logistics, payment and certification systems. The failure to consider the barriers to adopting e-commerce can lead policymakers to overestimate the potential savings while underestimating the new costs that firms in developing countries may experience as a result of participating in electronic transactions.

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References

- April, K.A., & Cradock, J. (2000). *E-Business: Redefining the Corporate Landscape in South Africa*. Durban: Butterworths.
- Benjamin, R., & Wigand, R. (1995). Electronic Markets and Virtual Value Chains on the Information Superhighway. *Sloan Management Review*, 36(2), 62-72.
- Bhatnagar, S.C. (1992). *Information Technology Manpower: Key Issues for Developing Countries*. New Delhi: Tata McGraw-Hill.
- Bhatnagar, S.C., & Odreda, M. (1992). *Social Implications of Computers in Developing Countries*. New Delhi: Tata McGraw-Hill.
- Chircu, A.M., & Kauffman, R.J. (1999). Strategies for Internet Middlemen in the Intermediation/Disintermediation/Reintermediation Cycle. *Electronic Markets*, 9(1/2), 109-117.
- Chircu, A.M., & Kauffman, R.J. (2000). Reintermediation Strategies in Business-to-Business Electronic Commerce. *International Journal of Electronic Commerce*, 4(4), 7-42.

- Cronin, M.J. (1996). *Global Advantages on the Internet: From Corporate Connectivity to International Competitiveness*. New York: Van Nostrand Reinhold.
- Department of Communication (DoC). (2000). *Green Paper on Electronic Commerce for South Africa*. Pretoria: DoC.
- Department of Trade and Industry (DTI). (1995). *White Paper on National Strategy for the Development and Promotion of Small Business in South Africa*. Pretoria: DTI.
- Department of Trade and Industry (DTI). (2001). *Driving Competitiveness: An Integrated Industrial Strategy for Sustainable Employment and Growth*. Pretoria: DTI.
- Dewan, S., & Kraemer, K. (1998). *Information Technology and Productivity: Evidence from Country-Level Data*. Irvine, California: Center for Research on Information Technology and Organizations, Graduate School of Management, University of California.
- Dolan, C., & Humphrey, J. (2000). Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticultural Industry. *Journal of Development Studies*, 37(2), 147-176.
- Downes, L., & Mui, C. (1998). *Unleashing the Killer App: Digital Strategies for Market Dominance*. Boston, Massachusetts: Harvard Business School.
- Dunne, N. (2000). *Timber Products Exporting in South Africa: An Exploratory Study*. Durban: School of Development Studies, University of Natal.
- Earl, M.J. (1988). *Information Management: The Strategic Dimension*. Oxford: Oxford University Press.
- Garicano, L., & Kaplan, S. (2000). *The Effects of Business-to-Business E-Commerce on Transaction Costs*. Working Paper No. W8017. Cambridge, Massachusetts: National Bureau of Economic Research.
- Gereffi, G. (1999). *International Trade and Industrial Upgrading in the Apparel Commodity Chain*. *Journal of International Economics*, 48(1), 37-70.
- Goldstein, A., & O'Connor, D. (2000). *E-Commerce for Development: Prospects and Policy Issues*. Paris: OECD Development Center.
- Habib, A., & Padayachee, V. (2000). Economic Policy and Power Relations in South Africa's Transition to Democracy. *World Development*, 28(2), 245-263.
- Kaplan, D. (2000). *The Role of Knowledge in a Contemporary Industrial Strategy – A Brief Review of the Literature*. Pretoria: Office of the Chief Economist, DTI.
- Kaplan, S., & Sawhney, M. (2000). E-Hubs: The New B2B Marketplaces. *Harvard Business Review*, May-June, 97-103.

- Kaplinsky, R., Morris, M. & Readman, J. (2001). Globalisation and Upgrading: Innovation and Learning in the Wood Furniture Value Chain. Brighton: Center for Research in Innovation Management (CENTRIM), University of Brighton.
- King, R. (1999). *Too Much Long Distance*. Fortune, 15 March, 108.
- Kraut, R., Steinfield, C., Chan, A.P., Butler, B., & Hoag, A. (1999). Coordination and Virtualization: The Role of Electronic Networks and Personal Relationships. *Organization Science*, 10(6), 722-740.
- Lee, H.G., & Clark, T.H. (1997). Market Process Reengineering Through Electronic Market Systems: Opportunities and Challenges. *Journal of Management Information Systems*, 13(3), 113-136.
- Maitland, C. (2001). *Institutional Assets: Shaping the Potential for Electronic Commerce in Developing Countries*. Unpublished doctoral dissertation, Faculty of Technology, Policy and Management, Delft University of Technology, Delft, The Netherlands.
- Malone, T.W., & Laubacher, R.J. (1998). The Dawn of the E-Lance Economy. *Harvard Business Review*, September-October, 145-152.
- Mansell, R. (2001). Digital Opportunities and the Missing Link for Developing Countries. *Oxford Review of Economic Policy*, 17, 282-295.
- McFarlan, F.W. (1992). Multinational CIO Challenge for the 1990s. In S. Palvia, P. Palvia and R.M. Zigli (Eds.), *The Global Issues of Information Technology Management* (pp. 484-493). Harrisburg, Pennsylvania: Idea Group.
- Montealegre, R. (1999). A Temporal Model of Institutional Interventions for Information Technology Adoption in Less-Developed Countries. *Journal of Management Information Systems*, 16(1), 207-240.
- Montealegre, R. (2000). Extending Chakravarthy's Strategy Framework to Cope with Constrained and Unstable Environments: Imitative Catching-up E-commerce at Patagon.com. *IEEE Transactions on Systems, Man, and Cybernetics*, Part A, 30(4), 472-89.
- Munasinghe, M. (1989). *Computers and Informatics in Developing Countries*. London: Butterworths.
- Munasinghe, M., Dow, M., & Fritz, J. (1985). *Microcomputers for Development*. Washington, D.C.: National Academy of Sciences.
- Nadvi, K. (1999). Collective Efficiency and Collective Failure: The Response of Sialkot Surgical Instrument Cluster to Global Quality Pressure. *World Development*, 27(9), 1605-1626.
- Nilen, B.L. (1984). Improved Data Processing Effectiveness Through Increased Attractiveness for Suppliers. In R.E. Kalman (Ed.), *Regional Computer Cooperation in Developing Countries* (pp. 183-186). Amsterdam: North-Holland.

- Organization for Economic Co-operation and Development. (1999). *The Role of Communications Infrastructures in Advancing Electronic Commerce*. Paris: OECD.
- Palvia, S., Palvia, P., & Zigli, R.M. (1992). *The Global Issues of Information Technology Management*. Harrisburg, Pennsylvania: Idea Group.
- Panagariya, A. (2000). E-Commerce, WTO and Developing Countries. *The World Economy*, 23(8), 959-978.
- Press, L. (1996). The Role of Computer Networks in Development. *Communications of the ACM*, 39(2), 23-9.
- Raisch, W.D. (2001). *The eMarketplace: Strategies for Success in B2B eCommerce*. McGraw-Hill.
- Schmitz, H. (2000). Global Competition and Local Co-operation: Success and Failure in the Sinos Valley, Brazil. *World Development*, 27(9), 1627-1650.
- Schmitz, H., & Knorrinda, P. (2000). *Learning from Global Buyers*. Brighton: Institute of Development Studies, University of Sussex.
- Sculley, A.B., Woods, W.W.A., & Woods, W.A. (2001). *B2B Exchanges: The Killer Application in the Business-to-Business Internet Revolution*. New York: Harper Business.
- Sokol, P.K. (1989). *EDI: The Competitive Edge*. New York: McGraw-Hill.
- South African Wooden Furniture Trade Directory (1999). Auckland, South Africa: Malnor.
- Steinfeld, C., Kraut, R., & Plummer, A. (1995). The Impact of Interorganizational Networks on Buyer-Seller Relationships. *Journal of Computer Mediated Communication*, 1(3). Available: <http://www.ascusc.org/jcmc/vol1/issue3/steinfld.html> (Accessed on 19 September 2001).
- Steinfeld, C., Mahler, A., & Bauer, J. (1999). Electronic Commerce and the Local Merchant: Opportunities for Synergy Between Physical and Web Presence. *Electronic Markets*, 9(2), 51-57.
- Steinfeld, C.W., Chan, A.P., & Kraut, R.E. (2000). Computer Mediated Markets: An Introduction and Preliminary Test of Market Structure Impacts. *Journal of Computer Mediated Communication*, 5(3). Available: <http://www.ascusc.org/jcmc/vol5/issue3/steinfield.html> (Accessed on 19 September 2001).
- Timmers, P. (1999). *Electronic Commerce: Strategies and Models for Business-to-Business Trading*. Chichester: John Wiley.
- United Nations. (2000). *Report of the High-Level Panel on Information and Communication Technology*. New York: United Nations.

United Nations Conference on Trade and Development (UNCTAD). (2001). *E-Commerce and Development Report 2001*. New York: United Nations.

Vreede, G., Jones, N., & Mgaya, R.J. (1999). Exploring the Application and Acceptance of Group Support Systems in Africa. *Journal of Management Information Systems*, 15(3), 197-220.

Weingarten, F.W. (1994). Public Interest and the NII. *Communications of the ACM*, 37(3), 17-19.

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