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# The Effect of E-Commerce on Development

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## ABSTRACT

The rise of e-commerce in emerging economies has presented a number of opportunities for micro-enterprises which include access to information and expertise, competitiveness and access to markets, administrative efficiencies, and productivity through learning about innovations. The occurrences of these factors suggest a rise in income and reduction in poverty. However, there are certain challenges that need to be overcome before the promise of e-commerce can be reached. This paper addresses the challenges in achieving the benefits of e-commerce. Following an analysis of the effects of e-commerce on development, this paper provides a framework for evaluating the factors that effect e-commerce in micro-enterprises. The expected contribution of this research is in formulating a lens through which micro-enterprises may implement e-commerce into their business processes.

## Keywords

E-commerce, micro-enterprises, developing countries, emerging economies.

## INTRODUCTION

A fundamental change that is unfolding before us is the growth of the Internet and the opening up of opportunities for business. Drucker (1993) explains that the growth of e-commerce is to the Information Revolution what the new railroad was to the Industrial Revolution. In the mental geography of e-commerce distance has been eliminated; one economy, one market. Gidden's (2003) insight into this global society is that the age of the nation state has ended and governments can no longer control economic life just as the welfare state cannot remain intact. He suggests that globalization is a political, social, and cultural as well as an economic phenomenon that is revolutionizing the way in which we live. Servon (2002) adds that while information technology has wrought fundamental changes throughout society, it benefits and hinders the progress of social and economic development. In addition to altering commerce, education, government, and communications, information and communication technology (ICT) affects the construction of and response to social problems such as poverty and inequality. The very existence of the "digital divide" – or lack of access to ICT to certain segments of the population – exacerbates inequalities (Servon, 2002). At the same time ICT can bring education to people, healthcare to disadvantaged communities, promote civic engagement and better management of natural resources. Norris (2001) provides us with a distinct view of the digital divides. She suggests that the digital divide is a multidimensional phenomenon that encompasses three distinct aspects. The global divide refers to the divergence of Internet access between industrialized and developing societies. The social divide refers to the gap between the information rich and information poor in each nation. Within the online community, the democratic divide signifies the difference between those who do and those who do not use digital resources to engage, mobilize, and participate in public life (Norris, 2001). While the digital divide is large, the gap is decreasing rapidly (Sciadas, 2005).

Queau (2002) offers compelling insight into the global digital divide. He states that Internet access disparities are considerable. Although telecom privatization and deregulation have made traditional operations more efficient, they are not a guarantee for local access to the Internet. The nature of the telecom industry enables it to impose revenue terms because of their advanced technology, high speed Internet backbones, and net-concentration. This advantage has meant that a few dominating telecommunications operators can force service providers and customers to shoulder their access costs making it even more difficult to provide the most basic services in developing countries (Queau, 2002). This limited access increases the social digital divide making it difficult to provide educational and health services to the rural poor. This excludes entire

groups and countries from the benefits of information and knowledge bringing about a situation in which those who have the greatest need have the least access to the tools that can potentially help them out of their deprivation. In addition, Queau (2002) argues that a new culture is emerging of "information literacy" through online interactions comprised of visual representations and mental images that can potentially increase the disparities between people who are part of this culture in industrialized countries and those who are not, as well as within societies themselves. It appears that the growth of the Internet can also increase the marginalization of the world's poor unless steps are taken to ensure they get access too, or they may get left behind in the Internet economy (Stoler, 2001).

The question being addressed in this paper is how can e-commerce enable the disparities between people who have access to digital services and those who do not? It appears that some e-commerce activities may enable people who may not have access to the Internet to reap some of the benefits of arising from access to digital technologies and thus enable development. Following an overview of information technologies effect development, this paper considers the effects of e-commerce on development. Using the concepts relating to effects of IT on development, this paper investigates the extent to e-commerce brings about development. This investigation provides an analysis of how e-commerce benefits and technologies may enable micro-enterprises in countries to bridge the digital divide.

## THEORETICAL BACKGROUND

Development is in itself complex but is most often studied as a macro-economic phenomenon with static and well defined parameters. The theory of development economics considers the relationship between aid to developing countries and economic growth. In practice this relationship has been shaded by political and cultural factors that influence trade agreements and sourcing of goods and services. Apthorpe (1994) suggests that development theory as we have grown to know it has not been informed by relief aid, practices, and studies. The roots of development economics lie in the assumption that the objective for economies is their fitness not health and economic development thinking has revolved around machine metaphors (Apthorpe, 1994). This means that while development economics can assist us in measuring the condition of an economy to keep it functioning, it cannot fix unforeseen weaknesses in that economy. Schumpeter's (2002) theory has dominated development economics for many years. In his theory of economic development Schumpeter (2002) argues that economic development is seen as a static phenomenon. He explains that

> "given a particular population in a certain geographic environment, with a particular set of needs, that is socially and economically organized in a particular way, with given methods of production and stock of goods, we can ask what are the quantities and prices of all goods that will be produced and exchanged under these circumstances" (pp 94).

Schumpeter's contribution to development economics is the concept that economies go through cycles of growth. He suggests that through technical and organizational progress, development takes place as knowledge progresses. New technical innovations can bring about development if they offer opportunities for new enterprises. In addition to being an economic phenomenon, Schumpeter suggests that development is essentially a disturbance of equilibrium of the economy which he suggests is a static one. The third characteristic of development according to Schumpeter is that it occurs in a waves or separate partial developments that follow one upon the other. While development brings about gains in value it also leads to losses in value (Schumpeter, 2002). This view of economic development theory has been influential in studying changes in economies at the global level.

Economic development thus assumes that the behavior of people and production processes is predictable and only adjusts to constant changes in the environment in a purely passive manner. However, the reality of nations and regions is that they are constantly changing in response to predictable as well as unpredictable changes in their environments. Governments respond to change through policy making which is assumed to be a rational decision making process but is often political. Apthorpe (1999) suggests that policy practice is actually about who is included and who ignored or excluded. The style of policy discourses tends to see the data on economic conditions as being inclusive, the process rational and the remedy simply knowledge or research based (Apthorpe, 1999, pp 382). Development policy he suggests is embedded in discourse and composed of "urgent and unavoidable utterances" that distinguishes itself from its practices and operations by treating them as something else called implementation. At the same time policy discourse has recourse to neat, easily available and powerfully constructed sets of institutional, legislative, and financial resources (Apthorpe, 1999).

The nature of development is that its effects are wide ranging with social, organizational, and political consequences. This suggests that in order for development research to realistically inform the practice of development policy and implementation, there needs to be a greater analysis of the social processes effecting development. To this Apthorpe (1994) argues that development economics grapples with institutional building and re-building of organizations. It appears that in order to comprehend this ubiquitous yet ill-understood phenomenon, an inter-disciplinary approach is required (Apthorpe, 1994). In particular the concept of development in social science explores how reality is constituted in the development

process (Arce, 2003). The social development perspective enables a broader understanding of development to be achieved through top down national policy making processes as well as bottom up, "micro level" traditions like the actor oriented approach, which works upwards from individual level actions (Arce, 2003; Braa, Monteiro, and Sahay, 2004; Walsham and Sahay, 1999). Such research has a direct relationship to practice. Social development practice is intended to raise living standards, increase local participation in development and address the needs of vulnerable and oppressed groups (Midgley, 2003). The practice of social development is very pragmatic and is carried out by community workers, aid officials, policy makers, and other practitioners who are driven by pressing practical matters (Midgley, 2003). The following figure (Figure 1) presents a model for information technology for development from Qureshi (2005) that summarizes the relationships between IT and Development.
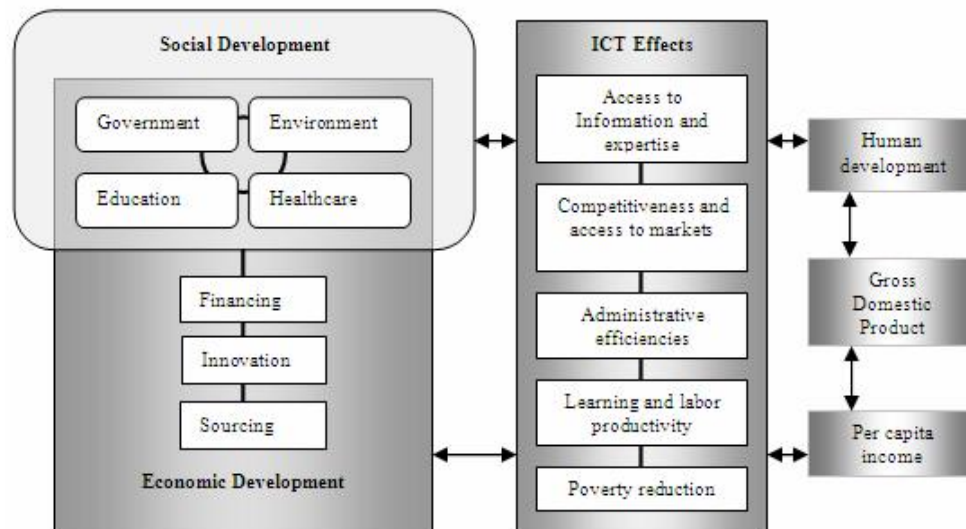


**Figure 1. Model of Information Technology for Development**
**(Extracted from Qureshi, 2005)**

Steinberg (2003) suggests that ICT is highly versatile and can help support development efforts if employed judiciously. The key issue is not unequal access to computers but the unequal ways that computers are used (Warschauer 2003). Assessing the potential value of ICT in supporting development requires us to address 1) the extent to which it can enrich people's lives by bringing ideas and experiences to those in the most isolated villages; 2) the technology's record with respect to achieving specific development objectives; and 3) its contribution to overall development and sustainability (Steinberg 2003). The growth of the Internet has opened up new opportunities for companies in the developed world to work with developing countries. We argue that e-commerce has enabled development to take place by bringing about greater access to information and expertise, increasing competitiveness and access to new markets, administrative efficiencies through e-government, learning and labor productivity which lead to poverty reduction (Figure 1). Among the most significant of these is e-commerce for micro-enterprises that are predominantly agriculture based in Africa (UNCTAD Report, 2003).

## E-COMMERCE EFFECTS ON DEVELOPMENT

E-commerce is rising and presents a number of opportunities. Technology trends positively affecting e-commerce include the growth of broadband, security issues, and the development of web services (UNCTAD Report, 2003). Possible tools and techniques for e-commerce in developing countries can include: communities, auctions, portals, e-markets, web retailing, online catalogs, search and retrieval capabilities, electronic payments, e-collaboration, and cyber cafés. Other recommendations include free and open source software (UNCTAD Report, 2003).

According to the United Nation's 2003 report on e-commerce and development there are three main benefits from e-markets and online auctions that can be achieved by developing countries (UNCTAD Report, 2003). These benefits include reduced costs, reduced or transformed use of intermediaries, and price transparency and formation. The report suggests that agriculture (i.e. tea and coffee) could provide a viable market for developing country markets online. Already these countries can benefit from the reduced costs of their agricultural products. The Internet makes it possible to bypass some of the

intermediaries, again reducing costs. Online auctions are similar to offline auctions; however, they provide benefits in terms of convenience, flexibility, and cost reduction (UNCTAD Report, 2003).

The report also states that "governments foster an improved understanding of best practices in the use of ICT so that optimal choices can be made regarding the most efficient use of ICT. Also, Governments should support the development of infrastructure that will provide greater access to low-cost, high bandwidth Internet connections and the use of affordable software and should play a leading role in addressing skill deficiencies in the workforce through training and education" (pp xx). Montealegre (1996) used a literature review in order to give direction to managers of less developed countries (LDCs) during their implementation of e-commerce. He concluded that managers in less developed countries need to understand the evolution of countries and companies approaches to e-commerce, gain insight into development phases and type of commercial activity that exists today, and track changes that suggest where development may be headed. From these views we add negotiation as one of the key benefits for developing countries entering e-business. Another recommendation from the report suggests that collaboration be used in tackling the development and adoption of ICT in these emerging economies, including public/private partnerships, alliances, and consortia.

## RESEARCH METHODOLOGY

As this investigation first aims to discover what is known about the relationship between e-commerce and development, descriptions of generalized into concepts and relationships between these concepts. This will result in the development of theory. In developing the criteria for selection of case studies, the work of (Schultz and Leidner, 2002) was drawn upon. The studies were selected based on the following criteria 1) the studies were informed by real need, 2) they had rich empirical findings, and 3) explored pragmatic, practical organizational applications. The first step in our approach for analyzing the factors that we found was to identify relevant research articles. We used ABI/INFORMS in order to find relevant articles. We used search queries on variations of the words e-commerce and emerging economies; scholarly referred articles and proceedings only. This is not an exhaustive literature review because only empirical and conceptual papers from the year 2000 and after were considered to ensure currency of the findings. The studies used for this research are illustrated in Appendix 1.

Based on research from Webster and Watson (2002), our findings were set up in a table (Appendix 1) with the across the top and the articles across the side. This presents a concept centric literature review. Like Schultze and Leidner (2002), the results of this research contribute to the creation of an analytical infrastructure that allows researchers to ask questions about the conditions under which a certain kind of IT for Development solution is more appropriate than another. As the focus of this paper is IT for Development situated in practice, activities identified in the literature review were gathered into meaningful groupings.

## FINDINGS

The results of the research on e-commerce in developing countries uncovered a number challenges and opportunities for development. This research illustrates that emerging economies are being faced with many different types of challenges in using e-commerce in their organizations – which are mostly micro-enterprises in the agricultural sector. The following sections describe these results in the context of the IT factors that affect development from Qureshi's (2005) model (Figure 1).

### Access to Information and Expertise

A number of case studies illustrate how ICTs enable access to information, knowledge and expertise. In their study of information systems for rural micro-enterprise in Botswana, Duncombe and Heeks (2003) suggest that the role of ICT in enabling information and knowledge is important for both social and economic development. They found that there was a reliance on localized, informal social networks for their information for rural micro-enterprise. Information from these networks was of poor quality and not readily available; it appeared to fail the poorest and most disadvantaged entrepreneurs. ICTs represented an unaffordable addition to costs and the benefits of using them were not apparent. Duncombe and Heeks (2003) suggest that there is a role for the ICT intermediary in providing the needed information on markets, customers and suppliers. A second exploratory, qualitative study from García-Murillo (2004) used interviews to identify factors influencing the adoption of e-commerce in Mexico and solutions that some companies have used to overcome the factors. She concluded that obstacles included lack of credit, lack of adequate infrastructure, limited understanding of e-commerce technology, lack of patience from entrepreneurs, and poor website quality. In this case a lack of adequate infrastructure and information are factors that relate to information and expertise access. García-Murillo (2004) was not the only researcher to mention infrastructure. A number of studies suggested that access to networks, hardware, software, and telecommunications

infrastructure was the main factor that prevented emerging economies from accessing information and expertise (Lund and McGuire, 2005; Mansell, 2001; Panagariya, 2000; Purcell and Toland, 2004; Rao, 2003; Sarkar and El Sawy, 2003; Wresch and Fraser, 2005). Additional common factors mentioned site development and hosting, visibility on search engines, logistics, and banking and security (Wresch and Fraser, 2005). Wresch and Fraser (2005) used case studies and interviews from CEOs in five Caribbean countries to understand how these successful businesses in small countries have overcame the five barriers (telephony and Internet access, site development and hosting, site visibility on search engines, logistics, and banking and security) presented in earlier research. In their conclusion the researchers did find that the managers interviewed did struggle with each of the barriers.

**Competitiveness and Access to Markets**

The case studies suggest that ICTs enable access to both global and local markets. Kenney (2000) found that in Kenya, a rural farming cooperative established a relationship through electronic mail with EarthMarketplace, a US organization, to sell local produce directly to the American market – by-passing the distributor and increasing the revenues of local farmers. In a second study, Barclay and Domeisen (2001) conducted three surveys to find out if developing countries are ready for e-trade. Their research led them to present the following stages for e-competency in developing countries; effective individuals, basic web presence, info-structure, the extended organization, business transformation, and strategic transformation. Khalifa, Banerjee, and Ma (2003) also looked at trade processes and strategic processes as factors that can allow access to markets in emerging economies.

Research from García-Murillo (2004) was mentioned above relating to infrastructure and information; however her research also addresses competitiveness and access to markets. Factors in this category would include lack of credit, limited understanding of e-commerce technology, lack of patience from entrepreneurs, and poor website quality. Also, related to the lack of credit factor, research from Hawk (2004) attempts to identify some of the challenges of conducting B2C e-commerce in developing countries. He uses an exploratory study of Russia, India, and Latin America, and concludes with a discussion of two problems; low credit card penetration and poor delivery systems. The author mentions that most developing countries are in the state the U.S. was in, in the 90s in terms of e-commerce and Internet establishment.

Jennex, Amoroso, and Adelakun (2004) identify people factors, technical infrastructure, client interface, business infrastructure, and regulatory interface as success factors in their e-business research model. They use action research and case study of two organizations to validate their research. In conclusion, they identify worker's skills, client's interface (i.e. trust), and technical infrastructure as the most important factors to the success of a B2C e-commerce relationship. Trust is also mentioned by Mansell (2001). Le and Koh (2002) studied e-commerce development in Malaysia and identified web-presence, e-commerce initiatives, management, capabilities, and performance as access issues. Okoli and Mbarika (2003) mentioned sophistication of Internet use, telecommunications/ Internet environment, and traditional commerce infrastructure. Sarkar and El Sawy (2003) mention willingness of organizations to redesign business processes. Finally, Sulaiman (2000) used a survey about e-commerce in Malaysia to conclude that insufficient security, sales and marketing require high human interaction, and cost of setting up e-commerce is high. The research mentions that organizations are reluctant to use e-commerce because they feel that the electronic transactions are open to hackers and viruses. The organizations from the study were also skeptical about the security measures that need to be implemented in order to safeguard online payment transactions.

**Administrative Efficiencies**

For the most part the case studies that mention administrative efficiencies relate to government issues; government support in terms of social, technological, financial, and legal factors (Kamel and Hussein, 2002; Khalifa, Banerjee, and Ma, 2003; Sarkar and El Sawy, 2003). Others mention environmental factors, including environmental and organizational readiness and the political environment and aspects (Khalifa, Banerjee, and Ma, 2003; Molla and Licker, 2005; Purcell and Toland, 2004; Salman, 2004).

Mansell (2001) discusses international trade rules. Panagariya (2000) mentions negotiating access to developing markets (this might fit better above). Pare (2003) mentions transaction costs as an administrative efficiency and concludes that access to the Internet and World Wide Web is not going to decrease the transaction costs that companies have to pay in a global market.   Finally, Sulaiman (2000) mentions marketing, advertising, customer service and support, order and delivery, and payment.

**Learning and Labor Reduction**

There are case studies that show how ICTs enable a reduction in learning and labor. Chen and Ning (2002) develop a framework and test it against a case study in China. The goal of their research was to suggest a revised framework on Porter's Diamond of National Competitive Advantage and to apply it to the development of e-commerce in less developed countries. In conclusion they found an issue with there not being many banks in China, and only 11% have their own bank cards. Duncombe and Heeks (2002) specifically mention a lack of education and literacy as well as poor business skills as contributing factors. Hawk (2004) cites low credit card penetration and poor delivery systems as effecting labor. Lund and McGuire (2005) discuss tertiary education and illiteracy rates, trade by sector in terms of agricultural, industrial, and services value. The purpose of their research was review e-commerce trade in less developed countries (LDCs). They wanted to identify the causes of the absence of any role for the state; the underestimation of polarization in society and its effect on economic growth; and the failure to distinguish between types of e-commerce and determine whether developing countries are ready for the participation phase of e-commerce, if developing countries have the kinds of industries that might act as demand-pull sectors for e-commerce growth, and whether social, political and institutional arrangements are in place to encourage and sustain e-commerce. In their conclusion they suggest that by measuring participation and infrastructure, the authors used three indicators that most closely matched those employed by the WTO; access to personal computers (PCs), telephone usage, in terms of fixed-line and mobile phone subscribers, and the average cost of a local telephone call. Their evidence suggests only a small minority of people in developing countries, less than 10% of the population, and far fewer in LDCs, could be ready for the participation phase of e-commerce. Purcell and Toland (2004) mention human capacity, which also relates to Salman's discussion (2004) of the human condition.

**Poverty Reduction**

Certain ICT implementations have a direct contribution to poverty reduction. Cecchini and Scott (2003) found that while microfinance is crucial in helping poor villagers mitigate and cope with risk, it is also the most costly model of service delivery for banks. Smart cards with an embedded microchip containing information on clients' credit histories and software providing loan tracking, financial projections and branch management information helped a microfinance institution in Andra Pradesh reduce transaction costs and reach a greater number of poor people and their micro-businesses more efficiently. In his descriptions of country experiences, Kenney (2000) expects that as the costs of Internet service provision reduce through privatization, the greater the impact of ICTs will be on poverty reduction. Duncombe and Heeks (2002) also mention poverty, lack of affordability, and lack of transport as contributing factors.

**E-COMMERCE CAPABILITIES FOR MICRO-ENTERPRISE DEVELOPMENT**

According to Duncombe and Heeks (2002), micro and small enterprises (MSEs) are enterprises from the informal sector. They are unregistered, rural, and micro (i.e. less than 10 employees) in size. Duncombe and Heeks (2002) suggest that the majority of organizations in developing countries are micro-enterprises. The technologies that appear to support these small businesses in developing countries are cell phones and CyberCafe's (Qureshi 2005). Both of these technologies have some electronic commerce features such as cell phones are used to check online bank accounts in Africa and enable poor illiterate farmers to have their crop prices checked by the assistants at the CyberCafe's in India and Latin America so that they can travel to the market where they are most likely to obtain better prices for the crops. While online payments appear to be a challenge, e-commerce services provided by World Vision (http://www.worldvision.org/) allow for gifts, such as goats, to be made to people in developing countries. Small businesses in cottage industries producing arts and crafts have been able to sell their products directly to consumers in different parts of the world through web retailing. The rise of auctions and electronic markets to support farmers have also reduced the use of intermediaries and thus increased incomes (UNCTAD Report, 2003). The following table (Table 1) provides a summary of the e-commerce tools and techniques that could enable development to be enhanced.

It appears that access to the above e-commerce capabilities could be increased through the provision of low cost mobile and cyber café technologies. E-commerce is one of the growth areas for ICTs in Africa (Okoli and Mbarika, 2003). All 54 of the countries and territories in Africa have Internet access in the capital cities (Jensen, 2006). Yet the divide between Africa and the rest of the world is large: Mansell (2001) mentions that the "ratio of Internet users to the overall population in Africa is estimated to be 1:750 as a world average of 1:30" (pp 286). Development theories reported in this paper suggest that should micro-enterprises involving the above e-commerce capabilities continue to be facilitated, and then this gap may be overcome.

| Effects of IT on Development | | | | | |
|---|---|---|---|---|---|
| *Benefits of E-commerce* | **Access to Information and expertise** | **Competitiveness and access to markets** | **Administrative efficiencies** | **Learning and labor productivity** | **Poverty reduction** |
| **Reduced costs** | Communities, Auctions, Portals, E-markets | Communities, Auctions, Portals, E-markets | Web retailing, Online catalogs | Web retailing, Search and retrieval capabilities | Auctions, Portals, E-markets |
| **Reduced or transformed use of intermediaries** | Portals, Search and retrieval capabilities | Search and retrieval capabilities | Portals, Search and retrieval capabilities | Search and retrieval capabilities | Web retailing |
| **Price transparency and formation** | Electronic payments | Electronic payments, Online catalogs | Electronic payments | Online catalogs, Search and retrieval capabilities | Web retailing |
| **Negotiation** | Communities, E-collaboration | Cyber Café, Communities | Cyber Café, Communities | Communities | Communities |

**Table 1. E-Commerce Capabilities for Development**

## CONCLUSION

While the growth of the Internet is opening up new opportunities for e-commerce, the digital divide keeps the poorest nations from reaping the benefits of e-commerce. This paper has illustrated how information technologies bring about development and how e-commerce has the potential to bridge the digital divide by providing new opportunities for development. Following a literature review of the challenges facing e-commerce efforts, this paper highlights opportunities and provides a framework through which e-commerce capabilities may be harnessed for development. Further case studies are required to assess the implementation, use and value of such e-commerce capabilities.

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**APPENDIX 1: LIST OF THE REVIEWED ARTICLES.**

| Articles | Concepts | | | | |
|---|---|---|---|---|---|
| | **Access to Information and expertise** | **Competitiveness and access to markets** | **Administrative efficiencies** | **Learning and labor productivity** | **Poverty reduction** |
| Barclay and Domeisen, 2001 | | E-trade, service exporting, hardware, software | | | |
| Cecchini and Scott, 2003 | | | | | Microfinance, smart cards |
| Chen and Ning, 2002 | | | | Bank/ credit cards | |
| Duncombe and Heeks, 2002 | Remote locations | | | Lack of education/ literacy, poor business skills | Poverty, lack of affordability, lack of transport |
| García-Murillo, 2004 | Infrastructure, supply, demand factors | Lack of credit, lack of adequate infrastructure, limited understanding of e-commerce technology, lack of patience from entrepreneurs, poor website quality | | | |
| Hawk, 2004 | | Delivery, payment methods | | Low credit card penetration, poor delivery systems | |
| Jennex, Amoroso, and Adelakun, 2004 | | People factors, technical infrastructure, client interface, business infrastructure, regulatory interface | | | |
| Kamel and Hussein, 2002 | | | Social, technological, financial, legal, government issues | | |
| Kenney, 2000 | | E-mail relationships | | | Privatization |
| Khalifa, Banerjee, and Ma, 2003 | | Trade processes, strategic processes | Government support, environmental factors | | |
| Le and Koh, 2002 | | Web-presence, e-commerce initiatives, management, capabilities, performance | | | |
| Lund and McGuire, 2005 | Access to personal computers, telephone usage (i.e. fixed-line and mobile phone subscribers), average cost of a local telephone call | | | Tertiary education and illiteracy rates, trade by sector in terms of agricultural, industrial, and services value | |

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|---|---|---|---|---|
| Mansell, 2001 | Accessing networks | E-commerce trust | International trade rules | |
| Molla and Licker, 2005 | | | Organizational e-readiness and environmental e-readiness | |
| Okoli and Mbarika, 2003 | | Sophistication of Internet use, telecommunications/ Internet environment, traditional commerce infrastructure | | |
| Panagariya, 2000 | Availability of networks, hardware, and software, access to existing communication networks | | Negotiate access to developing markets | |
| Pare, 2003 | | | Transaction costs | |
| Purcell and Toland, 2004 | Telecommunications infrastructure, ICT usage | | Policy environment | Human capacity |
| Rao, 2003 | Connectivity, content, community, commerce, capacity, culture, cooperation, capital | | | |
| Salman, 2004 | | | Political aspects, environmental issues | Human condition |
| Sarkar and El Sawy, 2003 | Technological infrastructure, access to information and communication | Willingness of organization to redesign business processes | Favorable government practices | |
| Sulaiman, 2000 | | Insufficient security, sales and marketing require high human interaction, and cost of setting up e-commerce is high | Marketing, advertising, customer service and support, order and delivery, and payment | |
| Wresch and Fraser, 2005 | Telephony and Internet access, site development and hosting, site visibility on search engines, logistics, banking and security | | | |