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**Development of Electronic Commerce in Africa and
its Implications to Trade Statistics**

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I. Introduction

1. The Global Information Infrastructure (GIS) has been evolving during the last few years with rapid advancement of information and communication technologies, their falling cost and prompted by various initiatives. The GIS is characterized by shrinking of distance, time and space constraints and empowerment of institutions and individuals - where everyone obtain, process, publish and disseminate information regardless of location and type of media. The pace of progress towards Global Information Society however continued to vary from country to country based on needs, primacy of infrastructure and applications.

2. The Internet is central to the GIS and has moved beyond a mere communication tool. It has become vital to global competition of business, internal flow of information within organization and global trading. Empowering local users and democratizing societies, Internet is changing classical business and economic paradigms. New models of commercial transactions using electronic media has already become a reality creating global electronic market place. New enterprises that base on innovative but small front-up investment have been emerging on the Internet with links to the worldwide consumers.

3. Africa is joining this global environment. The true revolution and rapid growth in electronic commerce has come from its Internet-based component and the progress towards improving connectivity in Africa is encouraging. In 1995, Egypt, Tunisia, South Africa and Morocco were the only countries with direct links to the Internet. Now, four years later, there are 50 countries have direct Internet connections to their capital cities. The only nations that have no connectivity are Eritrea, Somalia and Republic of Congo. Even these have advanced plans to link to the Internet by the end of the year.

4. While there is a clearly demonstrated demand for access to full Internet services in the capitals and larger towns, the limited level of computerization and the higher communications costs outside these areas suggests that there may be insufficient demand in rural areas at present to launch nationally accessible services. Some countries including Angola, Benin, Botswana, Ghana, Kenya, Mozambique, Namibia, Tanzania, and Zimbabwe have provided a point of presence in secondary cities. Others maintain local dialup tariffs for calls from long distance within the country.

5. Access to sufficient international bandwidth for carrying out interactive activities over the Internet is still a major problem in Africa

that hampers advancement of electronic commerce in the region. The majority of countries connect with less than 64Kbps except Egypt, Morocco, Kenya, Namibia, Senegal, Tanzania, South Africa which boasts of a connection over 1 Mbps. However, such bandwidth itself is not adequate to access multimedia and interactive web sites. As a result the majority of web sites on Africa are now being hosted in Europe and North America.

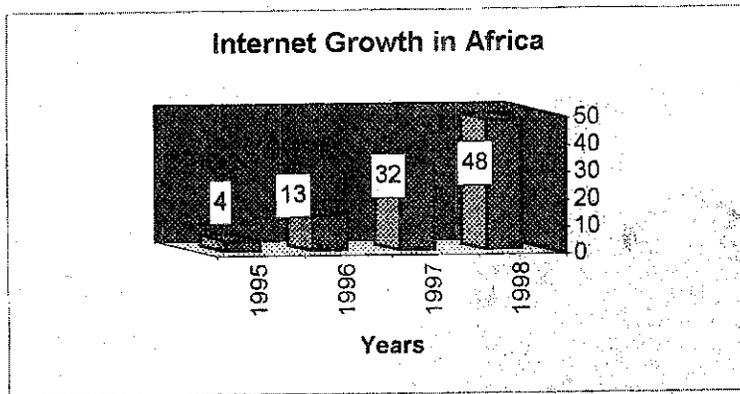
6. While some international Internet circuits in developing countries connect to Europe, the majority connect to the US. Generally ISPs must pay the full cost of the connection to Europe or the US, which effectively gives developed countries subsidized access to the developing world and further increases the costs that developing country ISPs must bear. Regional backbones or links to neighboring countries are also very rare.

7. Proliferation of a number of service providers has resulted in a number of direct connections that cannot talk to each other. The current climate of regional cooperation and national peering of service providers is discouraging. A survey carried out at Columbia University (USA) <http://www.comet.columbia.edu/~nemo/netmap/> shows that except in South Africa, Tunisia and Egypt, the majority of connections to the Internet are either via Europe or North America. Each country has a handful of local nodes connected to a gateway linked via satellite or cable directly to a major international carrier's network in Europe or North America. Africa's connectivity to the outside world is dominated by 5 Internet Service Providers: Alter.net, MCI, Sprint (sprintlink.net and gip.net), the Verio group and Teleglobe¹.

8. Although this high percentage of Internet growth has been achieved between 1995 and end of 1998 as shown in Fig. 1. There has been limited change in democratizing access to the majority of people around the continent. By the end of 1998, the number of users has reached well over 700,000. This makes the network density in the region 1 to 1000.

¹ see <http://www.ctr.columbia.edu/~nemo>

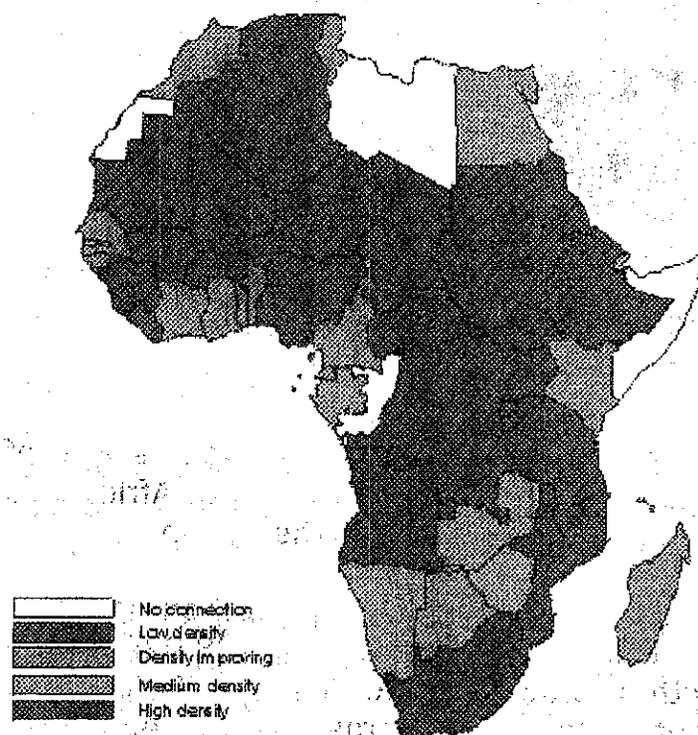
Fig. 1. Internet growth in Africa



9. However, this figure is misleading. South Africa's share of Internet users represents close to 90% of all users. South Africa also shares 90% of the electronic commerce activity in the region.

10. In reality one computer or an Internet connection is often shared among two to four users. There are about 428,025 dialup accounts in all of Africa, with 178,025 outside of South Africa. This means that there are about 1.2m users across Africa, 450,000 outside of South Africa. Taking this into consideration it is safe to say that the net density in Africa is about 1 link for 1500 people. This is 40 times lower than the global average. However, there is considerable variation in accessing the Internet throughout Africa. Figure 2. shows access and network density in the region.

Fig. 2. Internet density in Africa



11. Availability of direct Internet access in all African nations brought new opportunities along to all sectors - particularly to the private enterprises. Internet growth in the region has also shown the disparity and how vulnerable the region could be with its inadequate infrastructure, resources and political slack. The global shift from manufacturing orientation to service and knowledge has widened opportunities for growth, at the same time eroded the comparative advantages of the region in the area of cheap labor. Apart from health and education, electronic commerce remains one of the potential beneficiaries from the growth of the Internet in Africa. What is electronic commerce? What is its implication to Africa? What is its implication to the flow of information on trade? The next section provides an over view of electronic commerce followed by its use in Africa and its implication to trade statistics in the region.

II. Electronic Commerce Models

12. Electronic commerce refers to all business that uses information and communication technologies. It often refers to the production,

advertising, sale and distribution of products via telecommunication networks. Commercial transactions that involve organizations and individuals and that rely on the processing and transmission of digitized data, including text, sound and visual images using open networks such as the Internet or closed networks such as Electronic Data Interchange can be regarded as electronic commerce. The term covers activities such as online shopping, electronic trading of goods and services, online delivery of digital content, electronic fund transfers, electronic share trading, electronic bills of lading, commercial auctions, collaborative design and engineering, online sourcing, public procurement, direct consumer marketing, and after-sales service etc.

13. In all electronic commerce transaction parties interact electronically rather than by physical exchange or direct physical contact. Electronic commerce is thus a wide area composed of various models. The traditional model is a business-business transaction where two companies exchange products, invoices and payments - often called Electronic Data Interchange (EDI). Recent growth of Intranet and extranet has further stimulated the growth of business-to-business transactions - where a web platform integrates legacy systems and variety of databases, where one can establish virtual private networks without resorting to traditional "closed networks."

14. Electronic retailing that brings business and consumer together using new technology is another model. Internet and the WWW have been instrumental in advancing electronic retailing. This model is often known as consumer to business electronic commerce. A typical example is online bookshops such as Amazon and Barnes & Noble.

15. Internet and WWW technology have also been in use to improve transaction between business and government procurement and business and customs. Since government procurement is often substantial business to government link promises efficiency in the delivery of government services. E-commerce will not only enable developing countries to buy goods and services from around the world at advantageous prices but also allows them to participate as vendors in the global marketplace in ways that were earlier impossible. New export opportunities would attract new foreign and domestic investment enhancing national economic growth.

III. Electronic Commerce in Africa

16. The use of electronic commerce is not a new venture in Africa. The business-to-business model of ecommerce (EDI) is currently being used in Tunisia, Egypt, Morocco, Mauritius, South Africa and recently in Ghana. In Ghana for example EDI is maintained by a local Internet service provider the National Computing Services (NCS).

17. However, the number of small and medium enterprises that benefit from implementing electronic commerce for improving customer services, lowering inventory cost and decreasing procurement costs is far limited in Africa. In developed world the business-to-consumer model has proved real improvement over traditional retailing in terms of selection, price, order and delivery process. Although concerns such as secure transactions, infrastructure and jurisdictional issues are abound the business-to-consumer model has a greater potential for Africa.

18. Recent growth of the Internet has also witnessed a migration of private networks based on the Electronic Data Interchange to standard web-based commerce. For example there are a number of trade opportunity networks such as the UNCTAD trade points that heavily rely on the WWW. Hundreds of small and medium enterprises are adopting WWW to reach customers and employing sophisticated search technologies and structured data formats to allow users to buy and sell effectively. Business-to-consumer commerce in Africa varies widely. Many countries have established electronic payment systems, but traditional means of payment still dominates. The Web is mostly used to promote products through online catalogues along with contact information, or in some cases to allow placing online orders while the actual transaction occurs by conventional means, such as telephone, fax, telex or mail.

19. South Africa is one of the leading countries in business-to-consumer type of electronic commerce followed by northern African countries such as Morocco, Tunisia and Egypt. South Africa's electronic commerce forecast is about US\$ 50 million in 1996 and expected to grow to US\$ 2.5 billion by 2002. It has several e-commerce initiatives including, for instance, online banks (e.g., absa.co.za, standardbank.co.za), online malls (e.g., mall.mweb.co.za, wooceans.co.za), software stores (e.g., incredible.co.za/software), music stores (cdm.co.za) and portals (24.com). Several African stock exchanges have gone online, such as the Namibia Stock Exchange (nse.com.na) and the Nairobi Stock Exchange

(africaonline.co.ke/stockexchange/bin). Travel sites are one of the most widely visited areas of the African online marketplace, especially in Egypt, Kenya, Morocco, South Africa and Tunisia.

20. Innovative private sector electronic commerce initiatives are abound throughout the region although their impact is insignificant as compared to opportunities. Building a critical mass of electronic commerce users still require active government intervention not only as a regulator but also as a participant in government-to-business electronic commerce. Government has also significant stake in cutting down the fiscal, legal and infrastructural barriers to electronic commerce.

21. Although Internet and accompanying tools and technologies opened up opportunities that revolutionize retail and direct marketing, extensive regulations, including taxes and duties, restriction on the type of information transmitted, etc. has distorted its development in the Africa. Ease of access to the WWW due to low level of technology is one of the barriers to growth of electronic commerce. Ease of access is related to lack of high-speed link (greater bandwidth), ease of finding a service provider, reliable infrastructure and the difficulty in securing computer hardware, software, modems and ISDN lines at institutions and homes.

22. While communications remains the area for rapid change, the situation in many African countries remains gloomy due to various factors ranging from monopolistic regulations of telecom sector by the governments, inadequate local capacity to heavy reliance on public investment. The vital role of electronic commerce in the economy, rapid growth Internet and development of new technologies are often of less interest to regulators that are overwhelmed by day to day social and political difficulties. Infrastructure especially a good telecommunication network will remain the major bottleneck unless actions are taken based on local conditions.

23. Other secondary barriers are fiscal, political and technical. These range from price and risk from the factors such as security and privacy to user-friendliness of software being used for electronic commerce. A great concern has already expressed on the security of financial transactions on the Internet. Lack of consensus on jurisdiction governing controls of advertisement, taxation and contract enforcement dispute resolution and litigation in electronic commerce has also increased the level of potential risk in entering the electronic commerce market.

24. The limited application of modern tools in promoting international transaction in Africa is another barrier to the growth of electronic commerce. For example to date the banking industry in Africa has shown little interest to electronic commerce. Lack of credit card systems and even new culture such as Automated Teller Machines (ATM) meant the payment systems are far from being conducive to electronic commerce.

25. Lack of adequate skills in new information and communications tools for marketing, promotion and business is another factor that has continued to counter effective application of electronic commerce in the region. In fact, there is a danger that many companies particularly small and medium enterprises in Africa can be left out simply due to lack of awareness of the possibilities and opportunities. Education and training, raising awareness, publicizing examples of best practices have already become vital.

26. Electronic commerce in Africa should thus be seen an evolutionary than revolutionary. In general electronic commerce applications in Africa should be:

- cheap enough to be acquired by small and medium enterprises and governments
- designed focusing on those activities that are truly beneficial for consumers and users in developing nations.
- innovative to ensure sustainable growth taking into account each country's economic conditions and pace of growth
- adapt and change within or influence the legal and regulatory framework and infrastructure.
- promote collaboration between industry, local enterprises and the government

27. Effective application of the Internet to electronic commerce also raises key policy challenges to government, local enterprises and institutions. The government should create enabling regulatory, fiscal and economic policy environment, modify the current cost structure of the Internet, stimulate the awareness among potential users especially small and medium enterprises, enhance competition and foster capacity building. Institutions should strengthen and stimulate the capacity of private sector and public organizations by disseminating best practices and data on global electronic commerce.

IV. Implication of electronic commerce to trade statistics

28. Growth of electronic commerce, the efficient flow of information and the availability of trade data in a digital format have improved availability of trade statistics. Online availability of trade statistics and business information has in turn created opportunities for obtaining detailed insight into specific market requirements before full-scale production, for identifying the most suitable foreign buyer rather than relying on casual contacts and for finding the most competitive source for imported inputs, etc. Online trade statistics has become a key source of business information.

29. However, uneven distribution of online trade statistics has made it difficult to exploit its full potential. There is a tight network of business information centres throughout the developed market economies, however, data in developing countries are not available or only with a long delay when their usefulness is seriously affected.

30. Hampered by lack of infrastructure and cost of online trade statistics, African countries have not been able to benefit from the growth of electronic commerce and from the resulting business information. While the bulk of published trade statistics is available in printed form, online databases are becoming increasingly important. Some of these databases can now be accessed from the WWW. Statisticians in Africa have limited access to the Internet to gather data on foreign trade, production, consumption, population, income, prices, transportation, balance-of-payments and socio-economic indicators, etc. Limited skills in finding information on the global networks and inadequate processing and analyzing capacity in institutions has also made it difficult to gather globally available data on the Internet.

31. The inclusion of electronically tradable goods and services such as software, tourism, data processing, financial services and human knowledge and skills (teleporting, teleworking) have also created a new sets of statistics that is rather difficult to capture. There is limited consensus on how to gather information on tradable goods via electronic commerce. The majority of electronic transactions do not fit with the traditional data gathering technique. Global electronic trade statistics is thus full of estimates and projections.

32. The use of electronic commerce and online trade statistics is a new venture to Africa. Lack of over all plans and programs for the collection, processing, reviewing and linking of electronic trade with other economic data is an evident problem. A concerted effort is

required by regional and national statistical institutions to digitize information and build a capacity to gather and analyze data already available on the Internet. There is also an urgent need for:

- A comprehensive program for digital data development, dissemination,
- The development of more user-friendly sources and software for trade statistics and -in particular on Africa
- Increased awareness and training on availability and utilization of foreign trade statistics for international marketing.
- A mechanism for the preparation of foreign trade statistics on CD-ROM or in other machine-readable multimedia formats with user-friendly software such as browsers at reasonable prices.
- Development of clearing house and an easy-to-use tool that offers one stop shop for comprehensive trade statistics

33. Surveys should also be mounted on what is available globally in terms of online trade statistics, trade regulations, etc and on training capacities in online trade information gathering and analysis. The key to improved online trade information lies in upgrading of the producers of business information, such as departments of statistics, customs departments, ministries of trade, central banks, etc. capacity to gather and disseminate digitized data to meet the requirements of the local and international business community and the interested public. These should be encouraged to take advantage of modern information technology and new web-based information systems and electronic commerce based tools.

V. Conclusion

34. The success of electronic commerce in Africa heavily depends on support and trust by customers, technology developers, decision-makers, and other end-users. Governments have to develop all encompassing policies to guide development in information and communication technologies. All stakeholders have to be educated in term of the medium, security and benefits.

35. The telecommunications infrastructure should be improved integrating new satellite cable technologies available to date. Infrastructure is the prerequisite for any kind of application and value-added services. Electronic payments will continue to pose difficulties as far as the African banking system remains closed and unable to implement advanced and electronic based payment systems. The use

of new information and communication technologies for commerce should be encouraged by development aid agencies by launching further catalytic projects. Private and public institutions, entrepreneurs and users, in Africa should seize the opportunities to benefit from such growing market.

36. The ability to manage data and to offer qualitative and timely information will remain a difficulty unless concerted efforts are made both in managing trade statistics in digital format and in upgrading capacity of institutions to use information accessible via global networks. At a regional level there is a need for (a) guidelines for trade statistics through the Internet, (b) creation of the institutional framework for improving online trade statistics and for collection and analysis of already available data on the Internet and closing the resource gap through technical cooperation.

VI. Web resources on electronic commerce and online trade statistics

37. Below is a list of Web resources on electronic commerce and online trade statistics:

1. A framework for global Electronic Commerce.
<http://www.iitf.nist.gov/eleccomm/ecommm.htm>
2. Electronic commerce an Introduction
<http://www.cordis.lu/esprit/ecomint.htm>
3. Statistical data and information resources clearing house on trade statistics
<http://www.onedayweb.com/library/links/statinfo.htm>
4. Commodity classification systems
http://coe.ier.hit-u.ac.jp/COE_Newsletter/No.6.english/gaku.html
5. Resources for trade statistics
<http://www.lib.utulsa.edu/guides/stattra2.htm>
6. Statistical Resources on the Web on Foreign Trade
<http://henry.ugl.lib.umich.edu/libhome/Documents.center/stectrad.html>

VII. Abstract

38. Electronic commerce has been evolving rapidly over the last three years. Internet-based sales were estimated to total some US\$ 43 billion in 1998. Many analysts expect online business to be worth more than US\$ 300 billion early by the 2000 while the more optimistic projections range between US\$ 1 trillion to US\$ 3 trillion in the coming five years. As a result there is overall growth of market information ranging from numeric and full text data to information covering company registers, trade opportunities and tenders. Internet has also witnessed explosive growth of numerical trade statistics, price indices, and information on legislation, norms and standards, tariffs and trade regulations. The efficient flow of information and its availability in a digital format has also improved the flow of trade statistics. Electronic commerce has recently begun to emerge in developing nations as empowering tool for traditional and non-traditional produces and traders. This has increased the need for online trade statistics to generate business information on countries and products. This paper analyses development electronic commerce and the Internet in Africa and its implication to trade statistics.