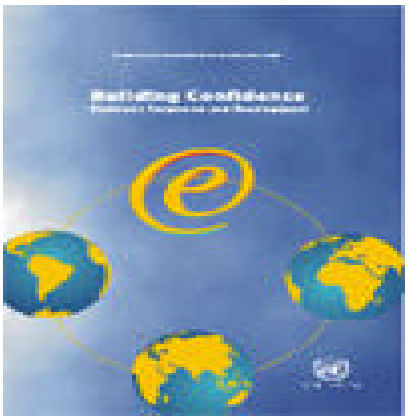
United Nations Conference on Trade and Development

Building Confidence

Electronic Commerce and Development



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Preamble

This publication draws extensively from the discussions and the main conclusions that emerged from a number of expert meetings and workshops, both in Geneva and in the field. In particular, GET UP, Global Electronic Trade UN Partnerships at the First Meeting "Partners for Development", Lyon, France from 9 to 12 November 1998. The Arab regional workshop on Electronic Commerce and a national seminar in Cairo, Egypt, from 26 to 28 and from 29 to 30 September 1998. Two expert group meetings were convened in Geneva respectively from 16 to 17 June and from 14 to 16 July 1999, respectively on "Exchange of Experiences among Enterprises in the area of Electronic Commerce" and on "Capacity Building in the Area of Electronic Commerce: Legal and Regulatory Dimensions". Additionally, UNCTAD organized a national seminar in Caracas, Venezuela, from 28 to 29 June 1999; as well as, three regional meetings. Meetings were held in Lima, Peru, from 4 to 5 August 1999 for the Latin American and the Caribbean countries; in Nairobi, Kenya, from 7 to 8 October 1999 for the African countries; and in Colombo, Sri Lanka, from 25 to 27 October for the Asia/Pacific Region.[2]

These were held pursuant to the agreed conclusions adopted at the closing plenary on 14 December 1998 of the third session of UNCTAD's Commission on Enterprise, Business Facilitation and Development. The Commission requested UNCTAD "to organize regional electronic commerce workshops" in which emphasis was to be put on stimulating an exchange of experiences among enterprises with a practical knowledge of electronic commerce. The events were also held pursuant to the consultations held by the President of the UNCTAD Trade and Development Board on 30 April 1999, which authorized the secretariat to organize four pre-Conference events for UNCTAD X.

The main objectives of the workshop and regional seminars were:

- To provide opportunities for direct exchange of experiences among enterprises and organizations involved in the use of electronic commerce;
- To enhance the knowledge and awareness of Governments, trade practitioners and entrepreneurs in developing countries regarding the economic, technical and legal aspects of e-commerce and the potential impact of e-commerce on the ability of developing countries to achieve greater participation in international trade;
- To identify main obstacles faced by developing countries in their participation in e-commerce,
- To propose actions and policies to be adopted by developing countries and the international community in order to promote participation by developing countries, including their small and medium-sized enterprises (SMEs), in global electronic commerce.

[1] The lists of participants in the seminars are included in the Annexes.

[2] The last four of these events were financed through the implementation of General Assembly resolution 53/220 (Development Account)

Participation in the regional seminars was high: in Lima, a total of 138 participants from Latin American and Caribbean countries, representing both the public and private sectors, attended the seminar. In Nairobi, there were 108 participants from 22 African countries, international organizations and observers from other regions. In Colombo over 120 participants attended from 17 countries, international organizations and observers.

The present publication aims to take stock of the material that was presented at the seminars and expert group meetings, as well as of the discussions and debates and the conclusions that were reached. A preliminary version of this document is circulated in view of UNCTAD's tenth Conference, (Bangkok, 12-19 February 2000). It is intended to contribute to animating the debate around the Conference's theme "Knowledge for Development".

Acknowledgement

"Building Confidence" was prepared by a team led by Bruno Lanvin, Head of the Electronic Commerce Section of UNCTAD/SITE, and comprising the following UNCTAD staff members: Jolita Butkeviciene, Dimo Calovski, Mahindok Faghfouri, Rouben Indjikian, Lorenza Jachia, Yusuf Kalindaga, Carlos Moreno, Venkatasubramani Pasupathy, Juan Pizarro, Cristina Rodriguez and Gloria Stawarz. Over the last two years, several interns have contributed to the collection of background material and references used in this publication, including Halimatou Ba, Halim Mohamed Aziz, and Maia Rodriguez.

The text was edited and desktop published 'on-line' from South Africa by Gillian Dwyer Stanbridge. The cover was designed by Diego Oyarzun-Reyes.

The major part of the credit for this publication should remain with the some 500 participants[3] who brought their experience, ideas and proposals into the series of national and regional workshops on "E-commerce and development". Special recognition also goes to the two consultants who provided background material for the discussions in these meetings, namely Peter O'Brien (who helped moderate the Lima workshop) and Mike Jensen (whose seminal paper on "E-commerce in Africa" is summarized in chapter 3).

A number of experts were consulted and commented on various chapters. Comments and inputs, including during the various expert meetings and workshops organized by UNCTAD over the last two years on the theme of "Electronic Commerce and Development", were received during various stages of preparation from Jean-Denis Belisle, Eric Blot-Lefevre, Boutros Boutros-Ghali, Henry Chasia, Hans D'Orville, Rosa Delgado, John Dryden, Esperanza Duran, Geza Feketekuty, Hugo Gallegos, Lalith Gamage, Chris Gibson, Sherif Hashem, James Johnson, Shashank Kansal, Masanobu Katoh, Francis Lorentz, Ira Magaziner, Amid Mamdouh, Philippe Monnier, David Mulls, Vijay Parmar, Judith Payne, Ben Petrazzini, Nii Quaynor, Jean-François Rischard, Daniel Salcedo, Renaud Sorieul, Bernard Stoven, Lee Tuthill, Christiaan van der Valk and Ray Walker. Their support, criticism and encouragement are gratefully acknowledged here. Remaining mistakes and inconsistencies remain the responsibility of the team leader.

[3] The lists of participants in the seminars are included in the Annexes.

Foreword

Electronic commerce is quickly emerging as a particularly visible and spectacular incarnation of globalization. At this stage, it is still too early to say whether electronic commerce will narrow or broaden the gap between rich and poor.

However, it is safe to say that the rapid expansion of electronic transactions constitutes a major opportunity for trade and development: it can be the source of a significant number of success stories by which developing countries and their enterprises can reach new levels of international competitiveness and participate more actively in the emerging global information economy.

For this purpose, the international community will need to support the efforts of developing countries to better understand and master the various aspects of electronic commerce. Such aspects will be technical, economic, legal and regulatory, as well as social and cultural. Over the last few years, UNCTAD has progressively built its reputation in the field of electronic commerce by fostering such inter-disciplinary approaches, as well as, by providing its members with the necessary support to stimulate direct and pragmatic exchanges of experiences among governments, enterprises and all components of civil society involved in electronic commerce and related activities.

This approach has been pursued not only in the context of preparations for UNCTAD's 10th Conference (Bangkok, February 2000), but also for the Year 2000 session of the United Nations Economic and Social Council ECOSOC (New York, June 2000). It is to be expected that, as its profound macro-economic and social implications start to be better understood, electronic commerce will remain an important item on the international agenda for still quite some time. May this publication contribute to enrich the debates on the development dimension of electronic commerce, and help build a global knowledge society in which all countries and cultures can find reasons to hope and possibilities to prosper.

Rubens Ricupero,

Secretary-General of UNCTAD

Chapter 1. E-commerce and development

As the world enters a new millennium, electronic commerce still looks more like a promise than a reality, at least as far as developing countries are concerned. To many, it may look more like a challenge than a promise.

Why should the Governments of developing countries divert scarce resources (human and financial) from other important development objectives to stimulate the development of electronic commerce? Why should they consider amending their legal and regulatory systems? Why should they adapt their negotiating strategies and goals to prepare for something which some still view as a fad, and others as an interesting but rather peripheral offshoot of technological change?

On the other hand, why should the present champions of e-commerce devote attention to its development dimension? And how can international organizations such as UNCTAD help in that process?

Introduction — Convincing evidence?

For those who believe that electronic commerce is a key to allow escape from the vicious circle of underdevelopment, the greater challenge, however, is not necessarily of an economic or political nature, but of a psychological and even conceptual nature.

- How can Governments (and public decision makers in general) be convinced that electronic commerce is not just yet another way of doing trade and business more efficiently?
- How can they be convinced that electronic commerce has started to affect radically, and in an irreversible fashion, the very fundamentals of economic theory and business practice?
- How can they be convinced that the functioning of markets, the formation of prices, the creation, definition and distribution of value need to be looked at from a totally different angle?
- How can they be convinced that the efficiency, competitiveness and even the *raison d'être* of enterprises require new measurements and definitions?
- How can they be convinced that qualifications, training and hence employment have started to be radically affected by the new trends affecting domestic and international business?
- How can they be convinced that such trends can still be influenced if action is taken at an early stage to stimulate the "development effects" of the e-commerce revolution?

The answer to these multiple questions is clearly in the reformulation of some of the foundations of current economic theories and policies. But such reformulation requires time,

because unless it is based on a significant body of facts and figures (i.e. unless anecdotes can be consolidated into respectable and comparable evidence), it will remain little more than a marginal working hypothesis.

To some extent, one could compare the state of international economics today with that of fundamental mechanics and astrophysics at the turn of the previous century. The Michelson-Morley experiment (which demonstrated the absence of an Aether Wind while trying to establish its existence) called for a complete re-statement of the way in which light (and hence almost everything else in physics) should be defined and understood. However, it took another few decades (and a genius named Albert Einstein) to infer from this new evidence a respectable (and now well-accepted) new theory known as relativity. In many respects, the advent of the Internet and the emergence of e-commerce as one of its most buoyant children have brought before our eyes a shocking evidence comparable to that of the Michelson-Morley experiment. In the absence of its own Einstein, the field of economic theory looks more and more like a distant approximation of reality.

One of the differences between physics and economics, however, is that the objects of physics (weight, mass, radiation, energy and so on) do not change their behaviour when physicists change their theories or assumptions. In economics, some "objects" do. Business, for instance, has a tradition of reacting more rapidly than Governments to changes in their environment. So, to come back to the questions raised earlier (how to convince decision-makers that they should change their behaviour?), one should not wait for Einstein or for Godot: for a significant while, evidence and experience will remain the only way to trigger action.

This is why this book was written. It is largely the result of several years of work by UNCTAD and a constellation of associated international organizations and private entities in the area of "electronic commerce and development". Such work involved the inevitable number-crunching, conceptual discussions and policy debates that remain necessary components of any reliable approach to such broad issues. But it also focused, modestly but stubbornly, on *experience*. The successes and failures of enterprises, Governments and other components of civil society their respective successes and failures in the field of information technologies, network-based management, knowledge-based strategies, internet and e-commerce, progressively became the core and the source of an ambitious attempt to cast the foundations of a "development approach to global electronic commerce" around the concept of e-velopment.

The immediate and longer-term objective of this work is contained in the title of this book: building confidence. In this respect, e-commerce can be compared to the practice of flying trapeze, a difficult exercise in which confidence is vital. In flying trapeze as in e-commerce, confidence rests on three pillars:

confidence in the medium (the ropes/the trapezes/ the safety net, on the one hand, vs the legal instruments/the "security" of transactions/ the Internet, on the other),
mutual confidence among the partners (fellow trapeze artists on the one hand, trading partners/fellow negotiators on the other hand), and
last but not least, self-confidence.

By showing how enterprises, administrations and individuals have been using e-commerce, one can contribute to building the necessary climate of confidence. If such a climate is established, e-commerce will not be a risky stunt or a leap in the dark – it will become a well-prepared, safe and enthralling collective experience. Confidence (in the system, in partners and in the self) is the vital element, which will allow e-commerce to grow rapidly and healthily, and be a true engine for global development.

Section I – Definitions, facts and figures

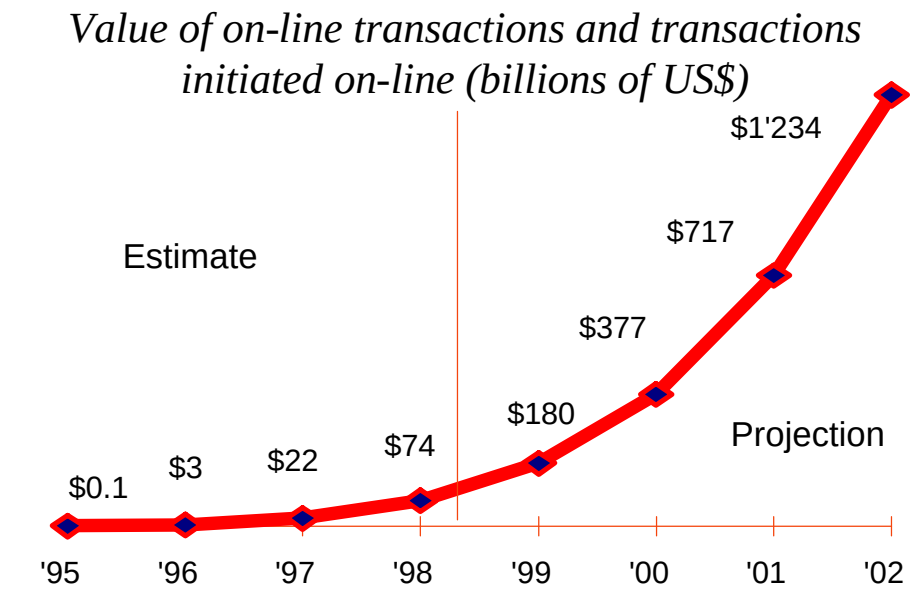
In order to assess the potential impact of electronic commerce on the economic and social development of developing countries, and to delineate the policies and strategies, which these countries should adopt in order to be at the winning end of globalization, the following questions need to be addressed in sequence:

1) What is the size, scope and speed of the growth of e-commerce? What is the "natural tendency" of the trends related to e-commerce, and how are they likely to affect developing countries?
2) How could developing countries influence such trends, and how could they benefit from them? Which policies and strategies should they adopt to do so?
3) Under which conditions would such policies and strategies succeed, and which obstacles could prevent them from doing so? What kind of actions (nationally, regionally and internationally) would be required to enhance their likeliness to succeed?

E-commerce will soon represent a significant part of international trade

Although estimates vary widely, all projections confirm that e-commerce flows will grow at an increasing rate over the next few years. In the Organisation for Economic Co-operation and Development (OECD), large countries in such as the United States are expected to remain the most active players, largely due to the continued expansion of e-commerce within their respective domestic markets. From an international trade point of view, e-commerce is posed to become a major component of cross-border flows: estimates range between 10 and 25 per cent of world trade by year 2003.

Figure 1. Value of on-line transactions



Source: Active Media cited in ITU Challenges to the Network 1998: Internet for Development

For developing countries, this means that commercial strategies and trade policies have to be updated in order to reflect this anticipated shift in the international trading environment.

However, such updating should be based on what e-commerce is likely to be in the near future, rather than on what it is today.

How will tomorrow's e-commerce differ from today's?

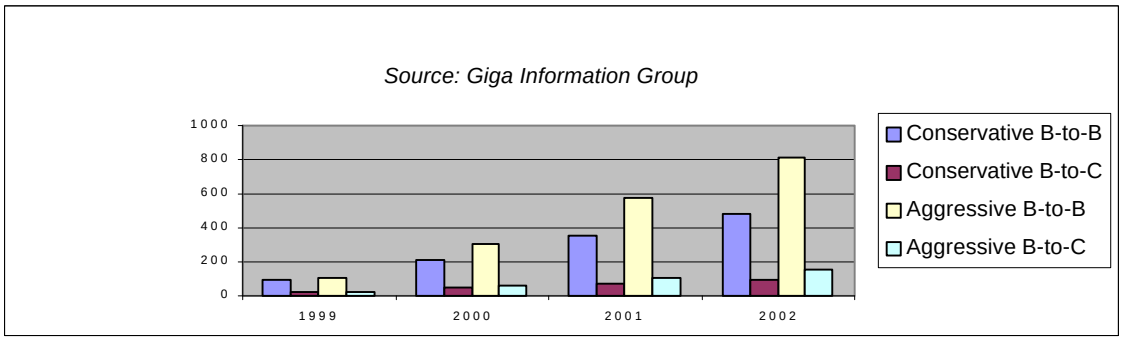
The United States and Europe will dominate world e-commerce

The change here will come from Europe's progressive "catching up" with the United States. Most available data show that the United States will retain its global lead in e-commerce well into the next decade,[4] but that Europe (led by Scandinavia) will soon reach the United States figures. Forrester Research estimates that European online business and consumer trade will reach US$1600bn or 6.3 per cent of total trade by 2004. It predicts that European sales of online retail goods and services will grow 140 per cent a year between now and 2004.

E-commerce will not be lead by business-to-consumer transactions

Over the last few years, much of the attention devoted to e-commerce has resulted from the spectacular growth in the level of activity and market valuation of some business-to-consumer (B-to-C) e-commerce companies such as Amazon.com or eBay. In some instances, the spectacular nature of such phenomena has helped to blur the e-commerce picture, because it led many observers to try to extrapolate the future of e-commerce from the trends in business-to-consumer e-commerce. This was all the more misleading as most of the "e-commerce revolution" was actually happening elsewhere, namely in business-to-business (B-to-B) transactions: even in the more developed "B-to-C e-commerce market" — the United States — projections show that B-to-B will be leading the future of e-commerce. Again according to Forrester Research (see diagram below), total United States business-to-business internet commerce — defined as the value of all goods and services purchased over the internet by business users (excluding advertising revenues) — has grown from virtually zero in 1990 to an estimated $43 billion in 1998, and is projected to grow to $843 billion by 2000.

Figure 2. United States e-commerce forecast (in US$ billion)



For practical, analytical and policy purposes, the following typology (see box 1) is of relevance.

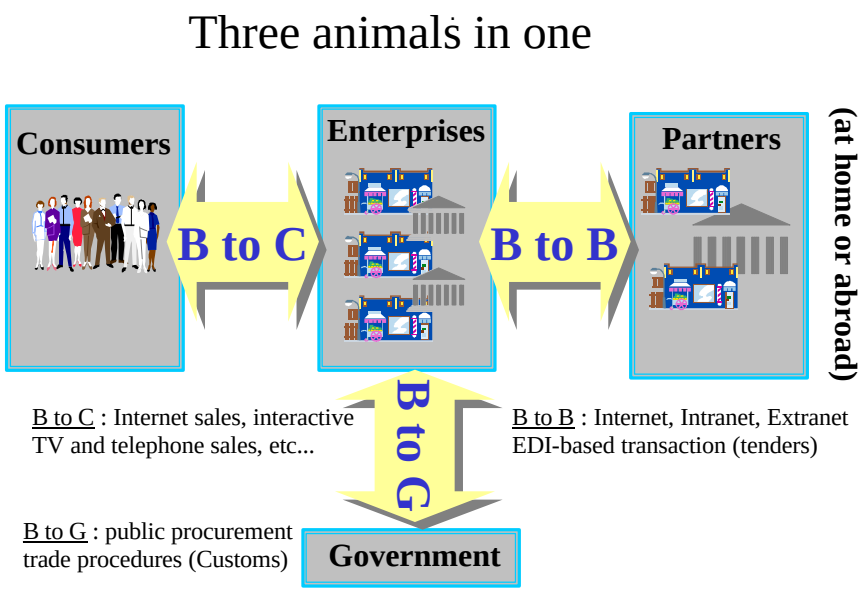
[4] See, for instance, figures from the Boston Consulting Group and Forrester Research (published 20 December 1999):. BCG estimates that by 2003 United States companies will trade $2 800bn worth of goods and services – almost one-quarter of all business-to-business purchasing in the United States – either via the Internet or private electronic data interchange networks. The rest of the world combined will only account for $1 800bn. The United States currently trades $700 bn electronically compared to $330 bn in the rest of the world.

Box 1. A typology of e-commerce

Although e-commerce always involves at least two participants, these participants can be of different nature. Depending on the pair involved, some very distinct type of e-commerce will take place.

The main three categories of agents likely to be involved in such pairing are: enterprises, individuals and Governments. Much of the e-commerce observed over its first few years of existence has been between enterprises and individuals (the "Amazon.com" type), and is generally known as "business-to-consumer" (or, for short, B-to-C). Less noticed in the media, the type of e-commerce which has been taking place between enterprises (e.g. among manufacturers and their sub-contractors, or between business equipment firms and their clients, e.g. the "Cisco type") is better known as "business-to-business", or B-to-C. Last but not least (especially for developing countries), e-commerce can be performed between Governments and public entities, on the one hand, and business, on the other hand, in the context of public procurement purchases; this last type can be described as "business-to-government", or B-to-G.

Figure 3



On the one hand, B-to-C has attracted much attention over the last few years, thanks to its rapid development in OECD economies, primarily that of the United States. However, B-to-B is clearly the area from which most of the expansion of e-commerce will come in the near future, especially as far as international trade is concerned. This is therefore the area to which developing countries should devote priority intention as a possible source of integration in the emerging global information economy.

The third type of e-commerce, namely business-to-government (B-to-G) could also be a major source of efficiency and experience for developing countries. By participating directly in e-commerce transactions, Governments can enhance their efficiency (for example in the area of public procurement) as well as their level of practical knowledge of the techniques and issues of e-commerce. In the process, cooperation and mutual respect between the private sector and the public sector could be significantly enhanced.

In the rest of this study, reference will be made to this typology as the operational and strategic basis on which e-commerce policies can be designed and implemented.

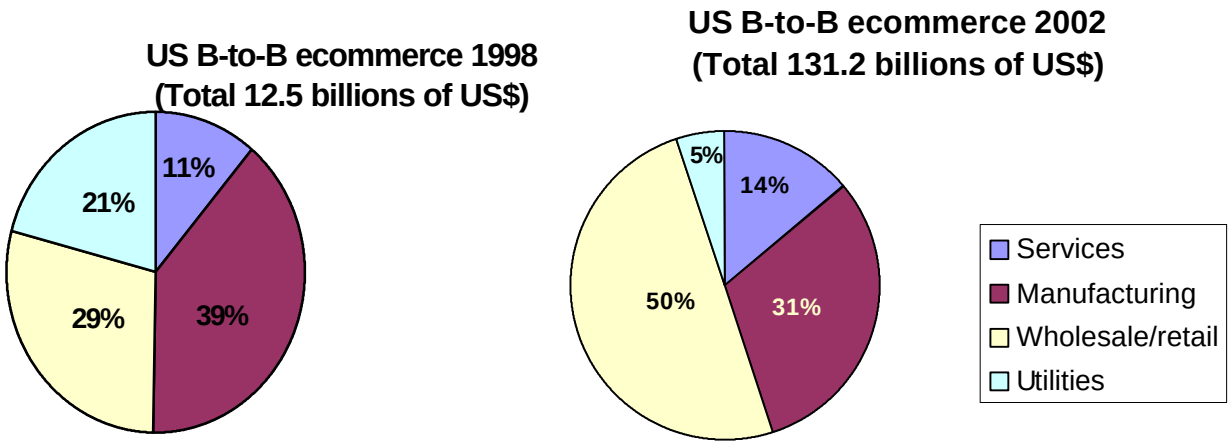
E-commerce will not be limited to services

For practical as well as institutional reasons, the World Trade Organization (WTO) has largely addressed the theme of e-commerce under the general heading of "trade in services". The line adopted by WTO members is that "by and large, the General Agreement on Trade in Services applies to e-commerce, and WTO will examine in which cases — if any — GATS provisions need to be modified or complemented to fully cover e-commerce".

One of the difficulties which the WTO may soon have to face with this approach is that related themes such as trade facilitation are handled within the context of GATT (i.e. trade in goods), which may make it more difficult at some point to reconcile the work accomplished in facilitating trade, on the one hand, and on electronic commerce, on the other. Whatever the complexity might be of the approach chosen by the WTO, it probably remains the only practical one that the organization could adopt, considering its mandate and purpose (to provide "rules of the game" for cross-border transactions).

Figure 4 – B-to-B in the United States (1998 vs 2002)

However, when one tackles the issue of e-commerce and development from an analytical



Source: eMarketer

and policy-oriented point of view, it is important to consider why and how enterprises adopt and implement e-commerce strategies, and how they could do so in the specific context of developing countries. Here, figures are unambiguous: *e-commerce is not a services issue*. Figures available for the United States, show that in the next three years, services traded electronically will remain a small part of total "B-to-B" e-commerce (see figure 4), and will increase only modestly (11–14%). This is particularly relevant for developing countries, whose exports still rely heavily (and will for quite some time) on commodities, and on semi-manufactured and manufactured goods.

It would be a tragic mistake to address issues of e-commerce in ignorance of the logistic aspects of trade. If developing countries can become beneficiaries of the development of e-commerce, it will be largely through lower transaction costs (especially through more efficient trade-supporting services), and by reaching new levels of international competitiveness in the goods sector.

Box 2. E-commerce, e-business and value-chain integration

(…) What exactly does "value-chain integration" mean? John Dobbs of Cambridge Technology Partners, a leading systems integrator, helpfully defines it as: "A process of collaboration that optimises all internal and external activities involved in delivering greater perceived value to the ultimate customer." Before the Internet, companies struggled to speed up and improve their supply-chain interactions. The most effective collaborative tool has been electronic data exchange (EDI), prevalent in industries such as food manufacturing and car making, where suppliers replenish in high volumes.

But EDI, although effective enough, has several drawbacks. The first is that it is both limited and inherently inflexible. It provides basic information about transactions, but it is unable to adapt to rapidly changing market conditions. Second, it is very expensive to implement, so many companies find it difficult to justify the investment. Third, because it is based on proprietary technologies rather than open standards, it locks suppliers and customers together. Last, as a pure business-to-business tool, it excludes the end-user from the value chain.

Internet technology, argues Cambridge Technology Partners, is everything EDI is not. It is ubiquitous and open to everybody. The intuitive point-and-click interface of the browser makes it easy to use. It is flexible enough to work either inside an organization (intranet) or outside in open (public Internet) or secure (extranet) form. It is cheap to set up and run. And it is global.

But above all, it is the open standards of the web that give it its extraordinary power to create new business models. Irving Wladawsky Berger, who runs IBM's Internet division, says it is this feature which permits the connection of processes that could not be connected previously. Applications that used to sit in watertight data "silos" within companies, such as logistics, manufacturing, financial information, procurement and human resources, are now able to talk to each other and to equivalent systems in other companies, pushing out information and retrieving it as needed. "A quantum leap in collaboration with partners and customers is now possible," says Mr Wladawsky Berger.

Source: *The Economist*, Survey on "Electronic Commerce", 1997.

EDI, however, did not spread at the pace anticipated by its proponents, because it remained a cumbersome and relatively expensive way of doing business. Small and medium-sized enterprises (SMEs) in particular, remained outside the EDI world. The few of them who did adopt EDI did so under the pressure of the larger companies for which they were suppliers or subcontractees.

E-commerce: EDI through other means ?

For several decades already, public and private entities have joined forces to promote universal norms and standards allowing trade-related documents to be exchanged seamlessly between computers on a global scale. This effort, which preceded the explosion of Internet-based electronic commerce, was organized around the concept of EDI (Electronic Data Interchange), and was spearheaded in particular by the United Nations Economic Commission for Europe (UN-ECE), where the EDIFACT norm was created and promoted[5].

[5] For further detail on EDIFACT, the UNECE website can be consulted (http://www.unece.org).

Box 3 . Toward XML

One of the biggest impediments to e-business is that computers are not very bright when it comes to recognizing context. Most people who use the web have been through exasperating searches that deliver either thousands of useless results or, even more bafflingly, next to nothing. As Microsoft's Bill Gates says in his new book, "Business @ The Speed of Thought", a query about the fastest computer chip on the market could easily produce information about the rapid delivery of fried potatoes.

The problem gets even worse when businesses are trying to communicate complicated catalogue or stock information to each other. This is because the web's main language, HTML (hypertext markup language), is essentially superficial. It tells a web browser how to lay out the contents of a web page, but it remains blissfully ignorant of the content.

The solution seems blindingly simple: use tags to label the content, rather than describe what it looks like. For example, HTML would label the elements of an order for a pair of trousers as boldface, paragraph, row and column. If they are tagged as price, size, quantity and colour instead, a program can identify the document as a customer order and do whatever is needed to get the trousers to the recipient as quickly as possible.

In the nick of time to allow e-business to take off, the World Wide Web Consortium (W3C), a not-for-profit group that controls web standards, has come up with an extension to HTML called XML (eXtensible Markup Language). XML not only describes the nature of web content, it also provides a way of indexing data. Its system of tagging data with relevant information allows applications running on other computers to respond in an appropriate way. For example, XML makes it clear that "*The Economist*" is a newspaper and not a particular economist. By using metatagging, data that describes other data, XML can also speed searches in the way a librarian's card index can.

The only drawback is that for XML to work properly, there has to be some agreement on definitions. It may be possible to achieve this within particular professions or industries, perhaps using an information intermediary as both initiator and ringmaster. But to ensure that there is a shared language of business on the Internet, cross-industry initiatives are also needed.

To its credit, Microsoft is actively engaged in just such an initiative, which it calls "BizTalk". It is using its market clout to bring together disparate customers, computing-industry vendors and consortia to define XML schemas (electronic dictionaries) to describe common business processes. For example, Microsoft and SAP have begun defining schemas for exchanging product-catalogue information and business documents.

Microsoft intends to incorporate BizTalk into future versions of its Office, BackOffice and Windows programs but, perhaps unusually for the company, it is going for open standards that will allow integration across all platforms, regardless of the underlying technology. As the Yankee Group's Harry Tse says: "Microsoft can win by not controlling XML."

The Economist, op. cit.

When, in the mid-1990s, web-based e-commerce started to grow, many foresaw the death of EDI. This did not happen, largely because EDI had at least one quality which the Internet could not offer (yet), namely security. The EDI community made the best of this additional lease of life by upgrading its approach to electronic commerce. Renewed efforts were made to accelerate the convergence of the EDI and Internet worlds under the leadership of UN-ECE — whose "working party 4", in charge of electronic data interchange for administration, commerce and transport (EDIFACT), became the United Nations Centre for the Facilitation of Procedures and Practices for Administration, Commerce and Transport (CEFACT) in 1998. The promotion of "XML" standards (see box) are at the centre of these efforts.

Section II — In search of a working definition of e-commerce

Many of the implicit and explicit definitions of e-commerce rely on past experience rather than on possible futures. Those who (often in a laudable and sincere effort at simplification) have attempted to reduce it to one of its subsets have made many mistakes about the real importance of e-commerce and its likely impact on economy. This has been the case, for example in "trade facilitation" circles (where e-commerce was reduced to an avatar of EDI — electronic data interchange), or in channels close to the WTO (where e-commerce was considered exclusively from the narrow angle of trade in services).). Even in some of the more enlightened business forums (such as the Global Business Alliance/GIIC) it has been argued that e-commerce is not a new form of commerce, but a series of tools which make it more efficient.

It will be shown later why such limitations might prevent the identification of some of the possible benefits and obstacles which developing countries might encounter in the field of e-commerce. At this stage, however, it is important to cast the basis of what could be a valid, robust and operational definition of e-commerce, for the purpose of the identification of its development dimension.

From description to implementation: the two operational definitions of e-commerce

The typology described above (B-to-B, B-to-C, and B-to-G) is useful to identify the trends which nurture the growth of e-commerce, and anticipate where developing countries might "fit in" in the future. In other words, it provides a useful map. However, if developing countries want to integrate with profit in the world of global e-commerce, they will need more than a map. Winning strategies will require a sense of direction, and a clear vision of which steps must be taken, and in what sequence. This means that, beyond a mere (descriptive) typology, successful e-commerce strategies will require operational definitions.

For the authors of the present study, operational definitions are understood as definitions likely to serve as a practical basis for action, in particular by offering developing countries and their enterprises avenues to design and implement appropriate strategies to succeed in the world of global e-commerce. Most of the definitions used so far in surveys and analyses of e-commerce have remained purely descriptive; moreover, by trying to offer a basis for the measurement of e-commerce flows, they have often constituted a heterogeneous and contradictory set of descriptions (see box 4).

At this stage, one can consider two main types of operational definitions of e-commerce. The first one (horizontal definition) corresponds to the transactional aspects of e-commerce, whereas the second one (vertical definition) focuses on the various "layers of requirements" necessitated by the implementation of an e-commerce strategy.

Box 4. Various descriptive definitions of electronic commerce

"As the Internet empowers citizens and democratizes societies, it is also changing classic economic paradigms. New models of commercial interaction are developing as businesses and consumers participate in an electronic marketplace and reap the resultant benefits. The GII has the potential to revolutionize commerce in these and other areas by lowering costs dramatically and facilitating new types of commercial transactions. The Internet will revolutionize retail marketing. Commerce on the Internet could total tens of billions of dollars by the turn of the century." (U.S. Executive Office of the President, 1997)

"Electronic commerce, defined simply, is the commercial transaction of services in an electronic format." (*Transatlantic Business Dialogue Electronic Commerce White Paper,* 1997)

"Electronic commerce refers generally to all forms of transactions relating to commercial activities, including both organizations and individuals, that are based upon the processing and transmission of digitized data, including text, sound, and visual images." (OECD, 1997)

"Electronic commerce is about doing business electronically. It is based on the electronic processing and transmission of data, including text, sound, and video. It encompasses many diverse activities including 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. It involves both products (consumer goods, specialized medical equipment) and services (information services, financial and legal services); traditional activities (healthcare, education) and new activities (virtual malls)." (European Commission, 1997)

"Electronic commerce is the carrying out of business activities that lead to an exchange of value across telecommunications networks." (European Information Technology Observatory, 1997)

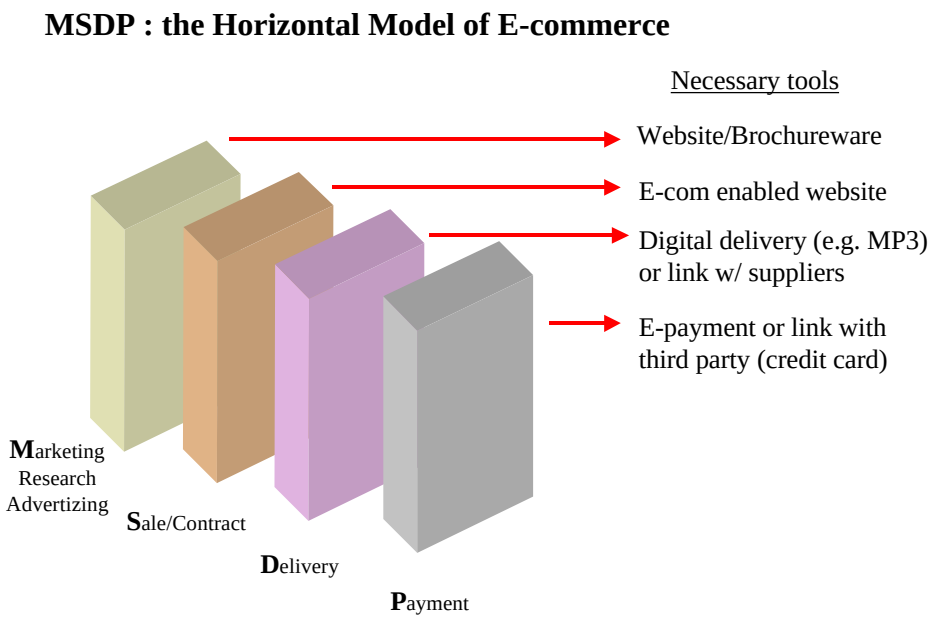
". . .electronic commerce, which has been limited to a number of specified companies, is entering a new era where many unspecified persons including general consumers are involved on the networks. In addition, its contents have come to include not only simple transactions of data concerning placing orders or order acceptance but also to general commercial acts such as publicity, advertisements, negotiations, contracts, and fund settlements." (Ministry of International Trade and Industry, Japan, 1996)

Horizontal definition of e-commerce: enterprises' concerns

If an enterprise considers entering the realm of e-commerce, it will have to check that it meets all the requirements that make an e-commerce transaction possible. As for any strategic choice of the same nature, the managers of that enterprise will naturally compare their "normal supply chain" to what their "e-commerce supply chain" should be. In so doing, they will check the viability and validity of their approach through the following sequence of business functions: marketing — sales — delivery — invoicing/payment.[6] This can be summarized graphically in the "MSDP" model below.

[6] Using a slightly more "strategic" terminology, one could define the functional components of the horizontal model as:: information-contract-consumption-settlement. An interesting extension of this model consists in adding the "production" step on the left of the diagram; a result of this extension, however is that one should no longer speak of "supply chain" and "e-commerce", but of "value chain" and "e-business", respectively.

Figure 5. MSDP model



The value of this first definition can be found both on the practical side and in the analytical field. From a practical point of view, it offers enterprises a simple "check list" on what will facilitate their management's task in identifying opportunities and obstacles when considering embarking on e-commerce strategies. From an analytical (and statistical) point of view, it also offers an interesting alternative to the current chaos of descriptive definitions. One could, for example, decide that *if at least two out of the last three components of the model (contract, delivery and payment) are performed on the network, one is in the presence of an e-commerce transaction*. Possible fiscal applications of such a definition come immediately to mind.

Vertical definition of e-commerce: governments' concerns

Instead of focusing on the steps of an e-commerce transaction, the vertical definition of e-commerce stresses the operational role of the various parties involved (e.g. Governments, legal and regulatory institutions, enterprises). As such, it is much closer to the concerns of government entities that will have to make strategic choices to create the proper environment for the development of e-commerce in their respective countries.

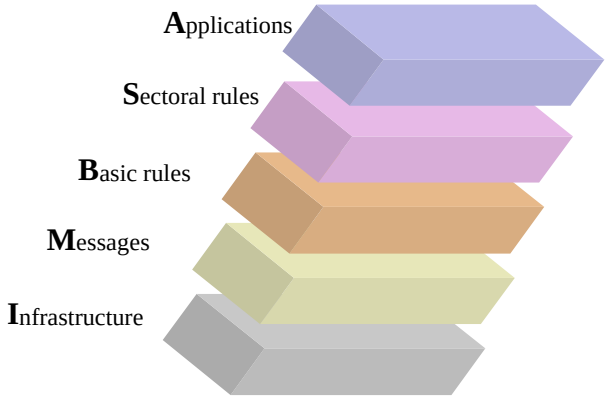
This second model (the IMBSA model) can be described in the following manner:

1. I as in Infrastructure — Initial requirements for the development of e-commerce are basically the same as for the development of Internet usage, and constitute the first layer of the model, namely that of telecommunications infrastructure.
2. M as in messages — On top of this first layer, it is necessary to develop the tools for the standardization and harmonization of the electronic messages that will be exchanged in the process of e-commerce transaction. Although this is basically an "international function" (messages need to be exchanged globally), Governments have a critical role to play in their adoption and dissemination.

3. B as in Basic Rules — Again such rules are largely of an international nature and embrace a domain much larger than that of e-commerce, strictly speaking; they concern, in particular, trade rules (WTO), intellectual property rules (WIPO), as well as generic regulations on the content of electronic messages exchanged across borders.
4. S as in Sectoral Rules — Each of the sectors of activity involved in e-commerce transactions will need to base its activities on a consistent and predictable set of rules and regulations. Such rules and regulations can be of a great variety in nature, scope and applicability. For instance, they can be related to banking operations (security, authentication, encryption), specific items which can be traded across information networks (music, movies), or even specific activities which could be affected by e-commerce (education, health).
5. A as in Applications — Once all the previous layers have been addressed, a successful e-commerce strategy will need to ensure that participating enterprises can actually benefit from the environment created. Designing efficient websites, designing and implementing adequate corporate strategies (including through joint ventures and alliances) will be part of securing this "last mile" of the road to e-commerce success.
6. Figure 6. below.

This vertical model offers two main interests. On the one hand, it allows Governments to have their own checklist in terms of providing the proper environment for the development of a successful e-commerce policy. On the other hand, it provides a roadmap for the work of those international bodies that will be called to contribute to the necessary set of guidelines, rules, standards and regulations that will make global e-commerce a possibility.

IMBSA : a structured representation of global E-commerce



	Focus	Leaders	Helpers
Applications	Practical implementation (B-to-C, B-to-B, B-to-G) secure E-com websites	Enterprises (B-to-C and B-to-B), govts (B-to-G)	ITC (export promotion, public procurement) UNCTAD (Trade Points), UNDP, WB (InfoDev) ..
Sectoral rules	Sectoral rules, sector-specific guidelines, policies and strategies	Sectoral business grps, WTO, spec. org. (transp, tourism,bank)	UNCTAD (trends, exch. of experience, analysis, policies), WB, UNDP, OECD, ICC, etc ...
Basic rules	Generic rules, guidelines and E-commerce policies	WTO (trade), WIPO (intel. property), UNCITRAL (mod-law), ICANN (Internet DNS), ..	UNCTAD (development aspects, analysis, data, trade aspects, ..), OECD (consumer protection, analysis, fiscal dimension), business grps (GBA, GIIC)
Messages	Harmon./interoperability Protocols and norms	ISO, ITU, ISOC, UNECE/CEFACT, business (W3G) ...	UNCTAD (promotion aspects), national/regional institutions
Infrastructure	Infrastructure/equipment	ITU, World Bank, private sector, govts	UNCTAD (regul. aspects, exch. of exp. , data)

New business models: the end of intermediation?

When e-commerce started to spread in the United States, the initial dominance of "B-to-C" was the source of a large body of literature predicting "the end of intermediation". To some extent, these predictions have been realized: in a number of sectors, e-commerce has allowed a significant shortening of production and delivery chains, and allowed measurable

reductions in transaction costs.[7] In that respect, the adoption of e-commerce practices responds to the same rationale as that of trade facilitation and, more generally, trade efficiency.[8]

However, dreams of the emergence of global e-commerce as the "big disintermediator" remain unfulfilled. While it is clear that, in some cases, middlemen have started to disappear (e.g. in retail, discount brokerage, music and auctions), it is equally clear that other types of intermediaries have either been created or reinforced. The difference between the disappearing intermediaries and the new ones seems to depend mainly on their abilities to generate value: in a networked economy in which location becomes less important, "physical focal points" (bank tellers, warehouses, stores etc.) appear more like obstacles than facilitators. Every time the network can afford to short-circuit them, it will do so. Why then does e-commerce favour the emergence of "new intermediaries" along the delivery chain? Two main explanations can be mentioned here, which both stem from current limitations and shortcomings of the internet:

- Most e-commerce/internet users have in one way or another been affected by the syndrome of "information overflow". A simple search generates an apparently infinite list of web pages, URLs and information sources, which often confuses the average user. In the case of a small enterprise operating in a developing country, this situation results in loss of time and money.[9] Enter the *infomediary*! This new kind of intermediary offers a service, or a range of services that promise to help e-commerce users (especially the smaller ones, like SMEs) to "select" relevant information through a series of sieves, portals or "customized services". B-to-B promises to be the segment of e-commerce in which infomediaries will become particularly important players. According to recent studies and projections, infomediaries will account for more than a quarter of all B-to-B Internet commerce revenues by the year 2002, and the gross value of transactions completed by B-to-B infomediaries will grow from $750 million in 1998 to approximately $211 billion in 2002.[10]

- Many potential users of e-commerce (especially SMEs) are still hesitant to embark on web-based strategies, because of the perceived "insecurity" of the Internet as a business environment and as a basis for contracts. So far, this situation has translated both in a "breach of the digital chain" (whereby banks or credit card companies continue to handle payments "offline"), and to the emergence of portals or hosts who can handle risk better by consolidating millions of individual transactions; this is the case in particular of eBay, which offers a central forum for a virtually infinite number of private auctions.[11]

[7] For evidence of such reductions, see, for example, the section on financial services, below.

[8] This commonality of motivation which unites e-commerce and trade facilitation, is one additional reason why an analytical approach to e-commerce and development should attempt to stay clear of the division of labour adopted by WTO, where e-commerce is being addressed under services discussions (GATS) While trade facilitation is being handled under discussions on goods (GATT).

[9] See chapter 3 below for data on the relative cost of Internet usage in developing countries. Until the adoption of UNCTAD's new strategy for the Trade Point Programme (September 1999), "information overflow" had been the main source of complaints from Trade Points. Electronic Trading Opportunities (ETOs) would arrive massively — often in an unstructured and hence unsearchable form — regularly exceed the absorption capabilities of most TPs.

[10] *Business 2.0,* September 99.

[11] These points are discussed in greater detail below, under "Financial services".

Box 5. From disintermediation to reintermediation

There are three acknowledged facts about the Internet's effect on commercial activity. First, it shifts power from sellers to buyers by reducing the cost of switching suppliers (the next vendor is only a mouse-click away) and freely distributing a huge amount of price and product information. But buyers can feel overwhelmed by this new power in their hands. They want one-stop-shopping: information they know to be accurate, and advice they can trust. Sellers are in no position to offer disinterested advice. That opens up opportunities for a third party: an infomediary.

The second fact is that the Internet reduces transaction costs and thus stimulates economic activity. A banking transaction via the Internet costs one cent, compared with 27 cents at an ATM or 52 cents over the telephone. Processing an airline ticket on the Internet costs $1, compared with $8 through a travel agent. But such savings may be available only to large businesses, such as banks and airlines, which reach customers directly. Infomediaries, by linking buyers and sellers via the Internet, can achieve similar savings for both in markets where they might otherwise miss out.

The third fact is that the speed, range and accessibility of information on the Internet and the low cost of distributing and capturing it create new commercial possibilities. Infomediaries, sitting in the middle between buyers and sellers, are uniquely placed to collect information, add value to it and distribute it to those who will find it most useful. They can create a virtuous circle by using information to attract more buyers and sellers, learning more about them in the course of their business transactions. For example, infomediaries such as Chemdex are trying hard to gain a dominant share of supplier listings because that is likely to attract a dominant number of buyers.

(…) Infomediaries should focus on solving a particular problem for a particular vertical market. By declaring a distinct focus area, the infomediary attracts buyers and sellers whose primary interest lies in that area. By sharpening their focus, infomediaries can provide a depth of information... that drives transactions by generating continued customer loyalty and participation. Increased customer participation adds yet more depth to an infomediary's knowledge base, which in turn drives more transactions.

It is ironic that the Internet's most distinctive business model should be a new kind of intermediary. Only a couple of years ago, enthusiasts were predicting widespread "disintermediation" when Internet commerce took hold. On the friction-free web, suppliers would be able to reach their customers direct without having to bother with greedy middlemen. Now intermediaries are suddenly fashionable again—and not just the new-fangled infomediary sort, but also some traditional businesses that have managed to reinvent themselves with the aid of the Internet.

Take Marshall Industries, an American company that has become one of the most successful e-businesses around. Once a classic middleman distributing electrical components, it has put all its business on to the web over the past couple of years and redefined its old supply chain as an information-based value chain. Marshall's web pages provide its 40 000 customers with a range of Internet-based services from technical data sheets to interactive training sessions and product seminars. The company also offers "just-in-time" stock management, and tells its suppliers how to run sophisticated marketing campaigns.

The lesson from both the infomediaries and from companies such as Marshall is that intermediaries will prosper if they add value, and that the web offers many new ways of doing so. Instead of "disintermediation", the new buzzword is "reintermediation". Not everybody can be a direct seller like Dell Computer.

Of the entirely new business models made possible by the Internet, it is the infomediaries that have the potential to be both highly profitable and difficult for rivals to dislodge. They can also vastly improve the efficiency of even low-tech vertical markets, such as road haulage or steel. But impressive though these fiercely entrepreneurial firms may be (and downright terrifying for some of the old-fashioned bricks-and-mortar companies whose necks they are breathing down), they are just a harbinger of what is coming.

The Economist, "The net imperative", 28 June 1999

Why is the emergence of the infomediary generating a new family of business models?

Any substantive modification of production or delivery chains implies a shift in the way value is being generated and profit acquired along such chains. The emergence of infomediaries and their ability to collect significant profit from e-commerce activities (see 14) thus suggests the emergence of new types of business model, in which "integrators" exert core strategic functions, and whereby profits no longer come from the margin between production costs and net selling prices (after taxes). In the emerging business model of Internet-based e-commerce, profits come from the "integration" of the production and delivery chains. This means that a particular link of the chain can be unprofitable without jeopardizing the economic value of the chain as a whole. What is vital, however, is that the e-commerce chain — best represented in this case by the horizontal (MSDP) model described earlier — should function in an integrated fashion.[13]

This new model is best illustrated by what is currently happening in areas like music or software. In music, in particular, the advent of efficient compression algorithms (MP3[14]) has allowed massive distribution of digital recording over the Internet. In the traditional business model of music sales (that of records, CDs and tapes), recording companies would attempt to charge customers for each downloaded program and prevent its reproduction. This would require at least two necessary conditions, namely: (a) the ability to collect "micro-payments" (typically a dollar or less) over the Internet and on a global basis, (b) the ability to protect original creations, either on the basis of global intellectual property protection rules (e.g. those overseen by WIPO) or on that of "technology-based" protection (through software encryption for example[15]). Since both conditions are extremely difficult to satisfy, music distributors and record companies (and, more and more often authors themselves) have resolved to offer MP3s free over the Internet. Revenues are not generated by sales, but by indirect sources such as advertising. Once a website starts to be recognized as a reliable, efficient and rich source for MP3s, potential advertising revenues increase with the number of visitors to the site. The final customer does not pay for the music downloaded, but spends some time in front of advertising banners. The author (or distributor) receives revenue from the companies that are interested in advertising on their websites.

This new business model has at least three important economic implications, namely (a) it offers authentic ways for smaller producers (individuals, companies and countries) to reach final customers worldwide, because entry costs associated with the physical production, packaging and distribution of records and tapes disappear, (b) it heightens the importance of those "infomediaries" which will create (and brand) the websites (and portals) that will attract a critical mass of customers and hence advertising revenues, and (c) it challenges a number of traditional approaches in areas such as intellectual property protection or fiscal policies, domestically and internationally: for example, is there any interest in pursuing a debate on

[12] These points are discussed in greater detail below, under "Financial services".

[13] This is widely recognized by all analysts and observers of e-commerce, even if some of them insist that "some parts are more vital than others". Peter Drucker, for example, considers that "delivery is key" (*Courrier International*, *Le Monde* en 2000, December 1999).

[14] MP3-encoded programmes can either be decompressed and copied to compact disks (CD recorders are now part of the standard equipment of personal computers), or listened to through special devices (MP3 players), which have the ability to download music directly from the Internet and play it "on request" with digital quality.

[15] An example of such protection would be to include a hidden string of instructions — similar to a virus — in every piece of downloaded music. This string would automatically erase the piece a given time after it has been downloaded. Once payment has been received from the customer, the distributor would send him/her a code that would invalidate the protection.

"duty free e-commerce" in WTO if cross-border sales are no longer the main vehicle for generating revenues and profits?[16]

Why are security concerns generating further new business models?

The importance of security concerns over Internet-based e-commerce has been both overemphasized and misplaced (see box 6). On the one hand, it has been clearly demonstrated that providing one's credit card number to an e-commerce-enabled website is significantly less insecure than doing so over the telephone to confirm a hotel reservation, or even handing it over to a merchant in a physical store. On the other hand, much has been said on how damaging this insecurity was to final consumers, whereas risk is actually largely borne by the provider. This perceived insecurity is thus much more of a deterrent for SMEs who could become e-vendors than to most other players.

Box 6. Did you say security?

Just about any computer-based system is vulnerable to external attack. But as companies move more of their core processes and transactions to the Internet and become e-businesses, they become potentially far more vulnerable because the Internet increases the number of entry points exponentially.

Exposure may take a variety of forms. Apart from simple theft, financial documents may be altered and illicit transactions carried out in the company's name. The interception and abuse of credit-card or banking information may compromise a customer. Confidential documents may be made public or passed to competitors. Copyrights and patents may be infringed. Above all, incalculable damage may be done to a firm's brand or reputation. Without adequate security technology, therefore, e-business rapidly becomes untenable. The trouble is that the Internet was originally designed with interoperability rather than security in mind. Grafting the requirements of business—that transactions should be private, secure, guaranteed and timely—on to the Internet has not been easy.

The first point of defence for most companies is the "firewall". In essence, it is a gateway allowing safe external connections to internal applications. These gateways should stop outsiders without the right credentials from getting access to things they shouldn't. There are at least three other main ingredients of Internet security. The first is encryption. If data is sent in "clear text", anyone can intercept and read it. Encryption, depending on whether it is "soft" or "hard", can make life difficult or next-to-impossible for would-be snoopers. America is still debating the ban on exporting applications with 56-bit keys (the most secure), and some Governments are demanding a right of access to such keys so they can catch out criminals and terrorists.

(continued)

[16] For having failed to anticipate the emergence of this new business model, companies like e-cash and Digicash have failed. Writing in *Slate*, his company's online magazine, Nathan Myhrvold, COO of Microsoft, explained that the main problem with usage-based charging for electronic information is that it is an *artificial distortion of the underlying economics*. Once an article is on a web site, it costs the publisher nothing to have it read. So why charge as if it did? One solution might be to offer a variety of payment plans, to maximize the number of readers: eager ones might go for a subscription, while browsers might want to pay just for the occasional article. But there is a better way to maximize the number of readers, Mr Myhrvold argues: drop the price to zero and make your money from advertising. And that, indeed, is what most online publications have done, to the dismay of the digital-cash companies. "The problem is that the new payment mechanisms matured before the market did," says Mr Hughes. "The real competition in informational goods isn't other payment schemes, but advertising."

Box 6. (continued)

The second is authentication of identity. This, too, can take soft and hard forms. It can amount to a simple password, or it may call for a digital signature. Messages are sent with a "hash code" that represents a unique signature. When the message is received, the code is checked to see if it matches code held by the recipient. Data may also be digitally signed as well as encrypted to ensure that it has not been tampered with. Digital signatures may be held and checked by trusted third parties, such as banks or credit-card companies.

But even that may not be secure enough for some companies. One increasingly popular alternative is the "virtual private network". VPNs offer a controlled pathway through the Internet open only to authorized users and authorized data. VPNs "tunnel" through the Internet, wrapping user data in Internet-protocol (IP) packets that hide the underlying routing and switching structure of the Internet from senders and receivers.

A further recent innovation is the public-key infrastructure (PKI), a complete set of products to provide total security. According to the Butler Group, an IT consultancy, such a set should include, among other things, public-key digital certificates (or electronic means of identification), somewhere to store them, means of revoking them, automatic updating of key pairs and certificates before expiry, key storage, back-up and recovery, and secure client-side software. Some companies, such as VeriSign, are offering centrally managed, outsourced PKI services, though the prospect of putting a company's entire security in somebody else's hands may be a psychological bridge too far.

The Economist, "The Net Imperative"*, op.cit.*

However, overemphasized as they may have been, security concerns about Internet-based e-commerce will not be fully addressed for some time. The current transitory period is hence expected to have several consequences. One has to do with the mobilization of major private enterprises and international bodies to promote universal standard messages (see above). Another is to be found in the area of risk evaluation and risk coverage, which will be examined below under "insurance and e-commerce". A third consequence has started to be felt in the emergence of new business models, especially with regard to payments. Considering the rapid expansion of "customized goods and services" delivered over the Internet, an increasing share of payments resulting from e-commerce transactions have been of remarkably small unit value. This has contributed not only to the emergence of the first new business model described earlier (free goods and services) but also to the unexpected incursion of established economic players in new areas of activities.

This is best illustrated by the way in which traditional payment collectors (banks and credit card companies) have allowed other players such as telephone companies to play an increasing role in the tracing, billing and collection of e-commerce-related payments. Early examples of this phenomenon can be been seen in areas not strictly related to e-commerce: in Finland (admittedly a country with the highest penetration rate of cellular telephones) it has been possible for some time now to stop your car at an automatic dispenser of soft beverages along some of the country's main roads, call a telephone number (painted on the front of the dispenser) and, when the machine's door opens, take away as many bottles/cans as desired. The billing is done by the telephone company through which the call was placed, and the charge appears on the customer's monthly telephone bill. The producer of the goods actually sold (the soft drink company) then receives a "bulk payment" from the telephone company. In this model, every party does what it does best: the soft drink company delivers the drinks and maintains the dispensers, whereas the telephone company collects micropayments related to phone calls. No bank or "e-cash" intermediary is needed.

Conclusion: from new business models to a new economic model?

As always in the case of the rapid emergence of new types of economic behaviour, analysts face the difficulty of distinguishing trends from anecdotes, and laws from trends. As far as e-commerce is concerned, however, there are reasons to consider that the type of new business models described above could soon require the formulation of new economic models.

One of these reasons can be found in the way in which businesses organizing their activities around e-commerce and the Internet tend to "cluster" along the production/delivery chain. In the e-commerce literature, this phenomenon is generally referred to as "network effects":

> "Just as crucial is the impact of so-called "network effects" as online business moves from a handful of evangelizing companies with strong market clout, such as Cisco Systems, General Electric, Dell, Ford and Visa, to myriad suppliers and customers. As both buyers and sellers reduce their costs and increase their efficiency by investing in the capacity to do business on the Internet, it is in their interest to persuade more and more of their business partners to do the same, thus creating a self-reinforcing circle".[17]

It is hence likely that the changes which electronic commerce is triggering in several sectors of activity will rapidly spread to other areas through such "network effects". If this is so, then, the new business models described above are indeed likely to generate some significant macro-economic changes. Previous industrial revolutions took place because of sudden changes in the way man could handle matter and energy. The information revolution and singularly e-commerce, is not about matter and energy, but about time and distance. As such, it affects some of the very fundamental working hypotheses along which we have become accustomed to represent international trade and financial flows.

For example, the whole modern approach to international trade is based on the so-called HOS model.[18] In the area of e-commerce, some of the most "unrealistic HOS hypotheses" do become very realistic: consumers and producers are indeed very close to getting free and perfect information on markets and productions (through so-called "virtual private auctions" for example), and — at least for digitized products — transportation costs can be considered as nil. Could e-commerce then be spearheading the "frictionless and profitless economy" which should result from perfect competition? The examples quoted earlier show that this is not the way e-commerce is heading because (a) e-commerce cannot be reduced to services (and hence transportation and transaction costs remain significant), and (b) while some intermediate transaction costs tend to disappear in network-based industries, infomediaries generate/address new types of transaction costs, proper to the information economy. One could also add to these two elements that e-commerce allows an almost infinite differentiation of products, which can practically be made and delivered to the specific requirements of any individual customer: as long as product differentiation is feasible, differentials in prices remain acceptable to customers, even in perfect markets.

[17] The net imperative, *The Economist*, 28 June 1999.

[18] As the modernized version of David Ricardo's law of comparative advantages, the Hecksher-Ohlin-Samuelsson model (HOS) is itself based on a series of simplifying hypotheses, which are never realized in the real world. Such hypotheses include, for example, the perfect information for consumers and buyers, the technological homogeneity of productions, and the nullity of transaction costs. The GATT/WTO edifice is based on this approach.

E-commerce is certainly less about technology than about strategy. The coming years are going to see a reversal of many of the business models which have guided the initial growth of e-commerce. One of the reasons for such a reversal is that many of the forerunners of e-commerce (dynamic start-ups with a focus on B-to-C) will progressively be replaced or absorbed by the "rejuvenated" big players that have traditionally dominated some of the major sectors of the world economy. Contrary to many earlier predictions, this phenomenon will not primarily affect services. When major manufacturers of automobiles, chemicals and industrial equipment, as well as retailers with a global reach, start to shift their activities towards e-commerce, massive shockwaves will be felt in employment, competitiveness and, more generally, in the way in which value is being created and distributed worldwide.

For developing countries, the challenge is all the more daunting that they have to apprehend this new reality from many fronts at the same time: economic, legal, social and even political. By raising a selected number of issues related to e-commerce and development, the following chapters will attempt to examine in a realistic fashion the current opportunities for developing countries to benefit from the expansion of e-commerce, and the obstacles that are likely to lie in their path.

Chapter 2 . Selected cross-sectoral and sectoral issues

One of the difficulties faced by the analyst in trying to describe possible relationships between electronic commerce and development is to be precise enough about each of the facets of e-commerce while not losing sight of the overall picture of development. The reason why e-commerce represents such a complex set of issues is indeed that it touches all major aspects of economic life

- because it is information-intensive, one cannot ignore its technology dimension;
- because it changes the ways in which enterprises work, produce and deliver, one cannot dismiss its micro-economic aspects;
- since it has such broad consequences on trade flows, payments, and possibly investment and capital flows, it is also to be reckoned as a macro-economic force;
- and last but not least, because it requires new skills and forms of industrial organization, it has to be looked at from a social and political angle as well.

An exhaustive study of e-commerce from all these successive points of view would be highly unpractical, especially from the point of view of developing countries, where national strategies, negotiating positions and domestic adjustments will need to be formulated and implemented rather quickly. Hence the rather modest, and action-oriented approach chosen in this chapter. Through intentionally different methodological approaches, two cross-sectoral and two sectoral issues are addressed from the point of view of development: fiscal issues, legal issues, transport issues and financial services issues. This choice was neither arbitrary nor random, but stems directly from the series of workshops and seminars organized by UNCTAD in 1999 around the theme of “e-commerce and development”. Workshop after workshop, region after region, these are the four issues that came again and again as priority areas of interest and concern for the experts and participants from developing countries. The following four sections largely reflect the debates which took place on those occasions, and propose a few answers to some of the most pressing questions regarding e-commerce and development.

Section I — Fiscal aspects of e-commerce

One can approach the delicate issue of taxation of e-commerce from two different perspectives. A first relevant dimension is the potential impact of the telecommunications revolution on the main macro-economic variables and hence on the volume and composition of tax revenue. To address this issue satisfactorily, the UNCTAD Secretariat is currently working with a computable general equilibrium model. This will be the subject of a working paper that will shortly be issued by the UNCTAD Secretariat. The highlights of the ongoing research are illustrated in this section.

A second aspect is the policy debate regarding the taxation of electronic transmissions and electronic commerce. This has been a contentious issue at the national and international level. In particular, a part of public opinion has been pressing for a "tax-free cyberworld" as a necessary condition for the development of the new telecommunication technologies while another part has expressed concern for the possible effects on the tax base and tax revenue. Section II outlines the basics of the debate and developments.

The impact of the Internet on main macro-economic variables

Evaluating the impact of electronic commerce on the global economy is no doubt a daunting task. Indeed, the final outcome will depend on variables that are only partially quantifiable, like the characteristics of the goods and services that will be exchanged on the networks and the infrastructure and human capital of the firms and the countries which will be the key players.

A quantitative analysis is necessarily restricted to observable variables and needs to be based on a number of simplifying assumptions. In the analysis that follows, two categories of goods will be distinguished: those that can be transmitted electronically across networks ("digitizable media products") and goods and services which can be traded through the network but are then delivered by conventional means (traditional goods and services).

Most authors agree that the electronic commerce in digitizable media products will not only tend to replace their traditional commerce but will increase in volume over the next years. Given that these goods are characterized by increasing returns[19] we cannot apply standard models to evaluate the impact of the Internet on the global trade of these products. At this preliminary stage of the research we are trying to determine how important the actual trade flows of these goods are for developing countries. Figures correspond to the SITC, Rev. 3 Classification[20] extracted from the COMTRADE database.[21] Table 1 shows imports of the goods that can be distributed through the Internet for 1997. Figures indicate that most of the trade is between developed countries, with the United States as the leading world exporter.

As regards the second category of goods and services, which can be traded through the network but are then delivered in traditional ways, it can be observed that they are mostly characterized by having diminishing returns to scale. To evaluate quantitatively the impact of electronic commerce in traditional goods on the global economy we apply a computable general equilibrium (CGE) model and specifically we use the GTAP model[22], which provides

[19] Increasing returns are explained by: (a) the cost advantage: given that the cost of the first copy is very high and the marginal cost of a second copy is nil or very low, the larger the quantity produced, the lower the per unit cost; (b) the network effect: the larger the number of users of a particular product, the larger the probability that other people will start using it; and (c) the groove-in effect tied to customers: the more one uses a product, the more he becomes familiar with it and the more it is convenient for him. See also: Joel Kurtzman, "Interview with Brian Arthur", *Strategy & Business* (Second quarter 1998). In the article, Brian Arthur refers to high-tech products but the arguments he develops can be applied to information goods that can be distributed through the Internet.

[20] The Standard International Trade Classification, Rev. 3, is a statistical classification of internationally traded goods, designed to provide the aggregation required for purposes of economic analysis and for the facilitation of international comparison of trade by commodity data.

[21] COMTRADE is the United Nations Database on International Trade, which is compiled by the United Nations Statistical Division and UNCTAD.

[22] For information on the GTAP Project please consult http://www.agecon.purdue.edu/gtap. For an introductory manual please refer to: T. W. Hertel, *Global Trade Analysis*: *Modelling and Application*, Cambridge University Press.

a consistent framework for analysis and is supported by a database updated to include data for 1995.[23]

Table 1. Trade flows of digitizable media products (in millions US$)

Imports of	from	Africa	Latin America and Carib.	Asia and Oceania	Transition Countries	Devel-oped countries	World
Africa		4.0	1.1	37.0	0.1	198.9	242.3
Latin America and Caribbean.		0.5	468.0	88.4	0.8	2331.9	2907.9
Asia and Oceania		2.4	1.1	1359.7	388.9	2771.4	4581.0
Transition Countries		0.1	2.9	65.0	283.6	1528.4	1890.7
Developed Countries		21.7	401.3	2890.2	310.0	33670.2	37382.1

Source: United Nations COMTRADE Database

Note: UNCTAD secretariat computations, based on data (SITC Rev. 3) reported by countries to the COMTRADE database. Digitizable media products include the following commodities: 8831, 8839, 8921, 8922, 89242, 8928 less 89283, 89431, 8986 and 8987.

The analysis is based on a comparative static approach. This means that for the sake of the analysis it is assumed that electronic commerce did not exist or was embryonic in the base year, and that it was subsequently instantaneously developed and deployed. A comparison is then made between the situation of the global economy before and after the Internet revolution.

It is assumed that electronic commerce reduces production costs through the reduction in transaction and interaction costs in both the manufacturing and the distribution process, which has been characterized as the single most important effect of the Internet revolution.[24] This cost reduction is simulated through a technical change, which increases the productivity of inputs.

The technological change assumption is justified by the observation that the recent innovations in telecommunications and information technology are fundamentally altering the way businesses work and thereby have the potential to yield a quantum shift in productivity. It should be noted, however, that a part of the economic literature rejects the idea of a "new economy",[25] in particular because productivity growth in the United States has been slower rather than faster than before the Internet revolution — if computer manufacturing is excluded from the calculations.[26] This is taken by some authors as an indication that while manufacturing of computers has indeed become more efficient as a result of the new

[23] GTAP was developed by the Purdue University with the support of a number of international organizations, among them, UNCTAD. It is a multi-country model of 45 countries/regions, five production factors and fifty commodities. It assumes constant returns to scale and perfect competition, and adopts a general equilibrium closure. The model takes into consideration the behaviour of production and prices of all commodities through links in production factors and trade flows.

[24] On the issue of interaction costs, see: Michael Nevens, "The mouse that roared", *McKinsey Quarterly*, Vol. 1, 1999, pp. 145-148.

[25] For a summary of the debate on "the new economy" please see: *The Economist*: "The New Economy", 24 July 1999.

[26] See: Robert Gordon, "Has the New Economy rendered the productivity slowdown obsolete?", available on the web at: http://faculty-web.at.nwu.edu/economics/gordon/researchhome.html

telecommunication technologies, this has not translated into higher productivity growth rates for the economy as a whole. Others argue that it is only a question of time before productivity improvements become evident not only in high-tech industries but in the rest of the economy as well and that statistics on productivity in services are at any rate inadequate.

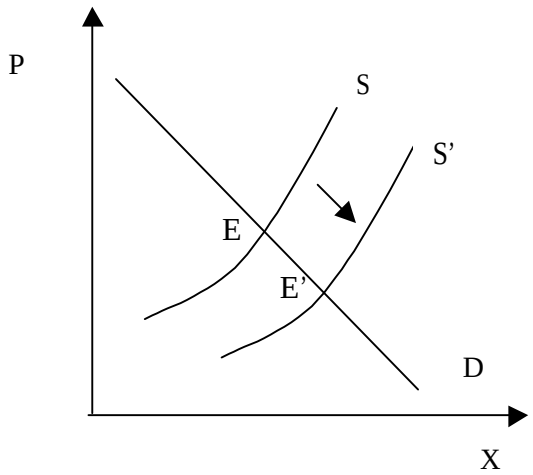
Be that as it may, the advent of Internet as a business tool has introduced profound changes both in the organization of the single firm and in the interaction of the firm with its suppliers and customers. Hence the analysis of the implications of the Internet revolution on the main macro-economic variables retains its merit.

Box 7. A graphical illustration

The utilization of the Internet by business can be thought of as a technological innovation, which improves the economic efficiency at the firm and industry level, which brings about a reduction in production costs, hence an increase in supply.

As Fig. 1 below shows in graphical form, the shift in the supply curve at the industry level results in an increase in the production and a reduction in the equilibrium price of good X.

Figure 7. Shifting supply curve at industry level



Clearly, this graphical illustration only refers to a partial equilibrium setting. In the general equilibrium setting that was utilized for the formal model on which the simulation is based, other markets are introduced. Specifically, the market for labour, capital, intermediate goods and other commodities are explicitly modelled. In particular, the numerical results are produced using a computable general equilibrium model (CGE). It is worth noting that name has the following basis: "general" –i.e. they specify the behaviour or several economic agents– "equilibrium" –i.e. prices of goods and factors adjust according to the market–, and "computable" –i.e. they produce numerical results–.

To simplify and delimit the analysis, the countries were aggregated into 6 regions: Developed countries, Latin America, Africa, Asia, Eastern Europe, and Rest of the World. Commodities were divided into four groups: primary/food, manufacturing, services (financial services, business services, recreational services, public administration, defence, education and health) and other services. Factors of production were divided into four groups: capital, land, labour and natural resources.[27]

[27] In the forthcoming working paper the potential impact of e-commerce on employment, wages, etc will be discussed in detail.

In this model, some experiments accounting for the effect of electronic commerce were designed. These experiments simulate a technological shock, which reduces the cost of services sector. The shock was introduced in the model in different ways. Only two of them will be described here. The difference between the two experiments is that, in the first one, the cost reduction is independent of the quantity of inputs utilized by the service industry, in other words, its output increases while inputs utilized remain unchanged (Hicks — neutral technical change). In the second experiment, the cost reduction depends on the increased efficiency of the services sector input, which allows the service sector to reduce the quantity of services sector input that it utilizes in the production process (technical change saves services sector input).

Table 2. Results from Experiment 1

	GDP (%)		Change in volume (%)		Welfare
	Volume	Prices	Exports	Imports	Millions US$
Developed Countries	0.94	-0.84	0.20	0.44	206313
Eastern European Countries	0.21	-0.63	0.59	0.06	1654
Asia	0.20	-0.58	0.49	0.12	5006
Latin America	0.20	-0.68	0.77	-0.05	3111
Africa	0.19	-0.61	0.50	-0.04	935
ROW	0.17	-0.70	0.64	-0.13	1618

Table 3. Results from Experiment 2

	GDP (%)		Change in volume (%)		Welfare
	Volume	Prices	Exports	Imports	Millions US$
Developed Countries	1.39	-1.26	-0.13	0.24	304628
Eastern European Countries	0.29	-1.01	0.78	-0.12	2195
Asia	0.35	-0.96	0.64	0.03	8463
Latin America	0.28	-1.08	1.07	-0.24	4427
Africa	0.48	-1.01	0.45	-0.11	2319
ROW	0.29	-1.12	0.73	-0.43	2679

In both experiments it was assumed that the impact of electronic commerce would not be identical across regions, but equal to 1 per cent for developed countries and 0.3 per cent for all other regions. These percentages do not intend to reflect the actual differences in access to the Network, which are discussed in Section II of this publication, but simply represent a working assumption.

Broadly, the results show that the improvements in welfare and increases in output from the technological improvement are spread rather widely, across sectors and across regions, even accounting for different levels of access to the technology and different levels of intensity in its utilization. These results are very conservative, for two reasons: first, because the simulated change is relatively small, and second, because the impact is projected to

affect only the services sector, in both experiments[28]. Furthermore, in the second experiment, it was assumed that there are no spillovers of the cost reduction in the services sector input onto the other sectors of production. Clearly, it can be argued that electronic commerce will affect the production and distribution in all economic sectors. If this were the case, the results from the simulation would be much larger.

However, if differences in level of technology access between developing and developed countries were much larger than those assumed in our simulation, electronic commerce would have important distribution effects on the global economy, implying a welfare loss for developing countries.

As regards the implications of the analysis for fiscal revenue, it is important to appreciate that — although the two experiments do not involve changing tax rates or introducing new taxes — the tax revenue is in both cases going to increase due to the expansion in the tax base.[29] At the same time, a progressive taxation system, by definition, distorts the allocation of resources across economic sectors, thus entailing a deadweight loss in society's welfare. It can be shown that — under certain conditions — a technological innovation will bring about an improvement in allocation efficiency, reducing the total deadweight loss from taxation.[30]

The current section cannot enter into further detail of the methodology and the results of the various experiments. Future work by the Secretariat on this issue will clarify and expand the aspects introduced above and will additionally incorporate the assumption of returns to scale and imperfect competition into the CGE-modelling framework. In fact, the results of a simulation, which is based on constant returns to scale and perfect competition, can be contradicted in size and/or sign if scale economies and imperfect competition play an important role in the productive processes.

The debate on taxation of electronic transmissions, electronic commerce and services related to Internet access

The problem of taxation is a very delicate and complex issue and the following section can only attempt to summarize the key aspects of the debate.

The problems

As was discussed in the previous section, the telecommunications revolution holds the potential for spurring economic growth and the redistribution of economic activities across economic sectors, in a way that is likely to have a positive impact on fiscal revenue in the long term.

At the same time, there is a legitimate concern by certain national and local governments that the development of the Internet may have the effect of shrinking the tax base and hence reducing fiscal revenue. The reasons behind these concerns may be summarized under two

[28] It can be observed that the exports of developed countries fall in volume terms. This is due to the reduction in exports of the services sector, always in volume terms, of which developed countries are the leading exporters. In turn, this reduction is due to the increased efficiency of the services sector input which allows a net saving in the quantity of input utilized.

[29] This increase may or may not be evident in value terms because the experiment changes the structure of prices, hence a comparison in value terms between the situation ex ante to the situation ex post is not an accurate measure.

[30] For a detailed explanation see: K. M. Huff and T. Hertel, "Decomposing Welfare Changes", GTAP Technical Paper No. 5, Purdue University.

headings: on the one hand, the difficulties inherent in defining jurisdiction in cyberworld and on the other hand, the problem of enforcement.

In the first place, taxation is inherently and inextricably linked with geographical jurisdiction.[31] In other words, in order to assess the tax due, it is essential to determine within which State borders a certain transaction took place or value was added to a certain product. To give a practical example, if a Swiss citizen purchases a music CD-ROM of an American pop singer from a local store, it is immediately clear that the transaction took place under Swiss jurisdiction, hence that the applicable indirect taxes must be levied. However, if the Swiss citizen downloads the music content of the CD-ROM directly from the website of the pop singer, it cannot be readily determined whether the transaction took place under the jurisdiction of the seller — located in the United States — or under that of the consumer — located in Switzerland.

This example also brings us directly to the issue of enforcement, which is the second dimension of the problem of taxation in the cyberworld. In fact, supposing that the problem of jurisdiction were to be solved, how could it be ensured that the applicable tax rate actually be levied? One of the key dimensions of tax enforcement is the cooperation of taxable persons and economic operators in general. The most advanced and most successful tax systems impinge upon the cooperation of intermediaries, which intervene throughout the production and distribution chain of most products and services.

In the VAT system of the European Union, for example, intermediaries are:

> "quite willing to participate in the VAT system and to cooperate with the tax authorities because they can charge the VAT to the next intermediary in the production process and in the end to the final consumer. In addition, they are reimbursed for the VAT they pay to the upper chain intermediary by the tax authorities. As such, an intermediary only pays VAT on the value he adds on the product".[32]

One of the reasons why the Internet threatens the EU VAT system and similar systems in other countries is that it enables the consumer to access the producer of the goods or service directly, reducing and in certain cases eliminating the need for intermediaries. In our example above of the Swiss citizen downloading the music content of a CD-ROM from the website of her favourite American singer, we can observe that all intermediaries — including the local music store as well as the discographic house — are eliminated from the distribution chain of the product. In this context, as the European Commission has quite effectively put it: "to place an obligation on taxable persons to require their customers to supply their names and addresses (…) would be equivalent to asking the consumer to opt on whether or not he wishes to be charged tax".[33]

The problem of enforcement is further exacerbated in an international setting, because the tax authorities have no power to impose obligations on the seller to cooperate in tax administration. This is not an issue in the context of traditional international trade, because

[31] These concerns have found a large echo in the press as well as in the economic literature. See for instance: S. Kobrin, "The Taxman Cometh", *Word Link*, September–October 1999; "Disappearing Taxes", *The Economist*, 31 May 1997; F. Horner and J. Owens: "Tax and the Web: New Technology, Old Problems", *Bulletin of the International Bureau of Fiscal Documentation*. D.J. ter Weel, "Cybertax", MERIT Working Paper, University of Maastrichet, Maastricht, The Netherlands, 1997.

[32] D.J. ter Weel, op.cit., p. 15.

[33] European Commission, D.G. XXI, "Indirect Taxes and e-commerce". Working paper prepared for the Working Party on Harmonization of Turnover Taxes.

customs administrations ensure that all imported products are levied the relevant VAT tax rate. As regards international electronic commerce, we can again distinguish the two cases of traditional goods and digitizable media products. In the case of traditional goods, the customs administration can only ascertain and levy the relevant tax if each and every package is screened at the border. It is clear that it would be hard for even the most modern customs administration to meet such a challenge. In the case of digitizable media products, it becomes all but impossible for the customs administration to ascertain the transaction at the moment it takes place just because there are no frontiers in the cyberworld.

Working towards possible solutions

The problems that we have summarized in the previous sections have been at the centre of the debate at the national and international level at least since 1997. OECD, in particular, has made a number of decisive contributions to the debate[34] and has become the forum of choice for working towards a solution.

In particular, the OECD has singled out the principles that should guide the work of Governments in the field of taxation of electronic commerce:

- *Technological neutrality*: tax administrations should treat similar transactions carried out by traditional and by electronic means in the same way;
- *Efficiency*: tax administrations should try to minimize compliance costs;
- *Certainty and simplicity*: taxation rules should be simple and clear;
- *Effectiveness and fairness*: taxation rules should minimize the potential for tax evasion and tax avoidance;
- *Flexibility*: taxation rules should be adaptable to technological and commercial developments.

It is important to emphasize that OECD has involved the business sector very closely in its programme of work. In particular, the *Global Action Plan for Electronic Commerce, prepared by business with recommendation for Governments* was submitted on behalf of business to the OECD Ministerial Meeting in Ottawa in October 1998.[35] The Action Plan contains a section with observations and recommended actions on Customs Duties, Taxation, Trade Facilitation and Customs Modernization.

Although agreement is taking shape on some of the underlying principles of taxation of cyberspace, the positions of Governments on the practical implementation of these principles are still widely divergent.

At the international level, upon the second WTO Ministerial meeting in Geneva, ministers issued a “Declaration on Global Electronic Commerce” in which they declared that their Countries would “continue their current practice of not imposing customs duties on electronic transmissions”. The Ministers further agreed that the declaration would be reviewed upon the third WTO Ministerial Meeting, taking into account the progress in the work programme on electronic commerce within the WTO. When the Third WTO Ministerial convened in Seattle,

[34] See in particular the “The Taxation Framework Conditions”, adopted by the OECD Committee on Fiscal Affairs and welcomed by the Ministerial Conference on electronic commerce held in Ottawa in October 1998. Supporting working papers include: OECD, “The Communications Revolution and Global Commerce: Implications for Tax Policy and Administration”, Paris, 1997; and OECD, “Electronic Commerce: A Discussion Paper on Taxation Issues”, Paris.

All publications are available at: http://www.oecd.org/daf/fa/e_com/e_com.htm.

[35] A second edition of the Action Plan was prepared in October 1999. It is available online at: http://www.giic.org/focus/ecommerce/agbecplan.html.

there was pressure by a large part of the international community to extend the moratorium on tariffs on electronic transmissions. A number of WTO member countries submitted official proposals to the WTO to support an extension of the moratorium.[36] However, agreement was not reached. Failure to reach a compromise will have no immediate consequences since no country currently imposes any tariffs on electronic transmissions.

Work in the WTO will continue according to the Work Programme: Section III below gives further details on this subject.

In this key respect, a recent working paper[37] has simulated the effect of the current moratorium on fiscal revenue. The UNCTAD Secretariat has repeated the calculations, adjusting the product coverage and increasing the number of countries covered by the analysis; and the results are shown in table 4 below. The main message is that tariff revenue that could potentially be lost if all international trade in these products took place electronically and if no tariffs were levied, would be less than 1 per cent on average of total tariff revenue and 0.06 per cent on average of total revenue. Considering the fact that only a small proportion of these goods is actually transmitted electronically, it would seem logical to conclude that imposing tariffs on international transmissions is hardly worth the while, much as the rate of growth of international trade in these products is very high. At the same time, it should be emphasized that because for developing countries the share of tariff revenue on total revenue is higher, the potential revenue loss has greater impact.

Table 4 Tariff revenue from digitizable media products

Country	Total tariff revenue from digitizable products (thousand US $)	Tariff revenue from digitizable products % of import duties	Tariff revenue from digitizable products % of total revenue
Africa	46939	0.49	0.09
Latin Amer. and Caribb.	181409	1.08	0.09
Asia and Oceania	221991	0.38	0.04
Transition Economy	71982	1.19	0.04
Developed	201981	1.52	0.02
World	724302	0.90	0.06

Source: Adapted from S. Teltscher, " Developing countries" Interests in Future Negotiations on Electronic Commerce: Revenue Issues", UNCTAD Working Paper, forthcoming.

Note: tariff revenues exclude imports, which are subject to specific tariffs (these concern especially the EU, US, Switzerland

[36] See: "Communication from Indonesia and Singapore", WT/GC/W/247; "Communication from Japan", WT/GC/W/253; "Communication from Canada", WT/GC/W/339; "Communication from Australia", WT/GC/W/367. A joint statement between the Government of the United States and the Arab Republic of Egypt – issued days before the Seattle Ministerial Conference – also expressed support for the extension of the moratorium (available at: http://www.ecommerce.gov/ecomnews/us-egypt.html). A different position was expressed by Cuba: "Communication from Cuba", WT/GC/W/380.

[37] R. Perez-Esteve and L. Schuknect, "A Quantitative Assessment of Electronic Commerce", Geneva, mimeographed.

[38] Cinematography films; printed matter; newspaper, journals etc; advertising material, other printed matter; video games; recorded magnetic tapes; other recorded media (CD, CD-ROMs, other discs, etc.).

A separate issue is the taxation of international electronic commerce in services. The potential revenue loss — due to erosion or evasion of personal revenue taxation — could potentially be very large. In fact it was estimated that "the share of value added that potentially lends itself to electronic commerce represents 30 per cent of GDP in services sectors".[39]

It is clear that such a large part of the tax base simply cannot go untaxed: indeed this would not be desirable for a number of reasons. The principle of technological neutrality advocated by both business and Governments means that there should be no difference in the fiscal treatment of transaction enacted by traditional and by electronic means. Additionally, in a context in which the tax base is shrinking due to the consequences of globalization on personal and corporate revenue, fiscal administrations have come under increasing pressure.

This should not, however, be taken as an indication that new taxes — specific to Internet transactions — should be introduced. In this respect, the early phases of the debate focused around the proposal for a "bit tax" which was put forward by a European researcher[40] and found a large echo in the literature, in the press and in the work of international organizations. More recently, the debate has instead focused on how to adapt the existing taxes to the new forms of transaction and the new business models that the Internet has brought about.

A number of proposals have been put forward, but debate on this key issue is still in its early stages. However, consensus is gradually emerging on the necessity to tax e-commerce transactions. Implementing taxation on e-commerce will require building consensus on both the underlying principles and the administrative procedures at the international level. There is no alternative to a constructive dialogue between Governments, the business community and the international organizations concerned to find a solution to the problems at hand.

To date, the voice of developing countries is still missing or only partially heard in this debate. This is partially due to the fact that tax collection is *per se* a challenge that many developing countries have only partially met. In many of the poorest countries, the tax base is very narrow and the technical capacity of the tax administrations to tap it is hindered by constraints in technological and human capital. These constraints are often rendered more acute by efforts to cut public spending, which form part and parcel of most structural adjustment programmes. It is clear that in these circumstances the solutions that can be found in the OECD countries to the technological difficulties of adapting existing taxes to the new reality of electronic commerce risk being wholly inappropriate to the conditions at hand in developing countries.

[39] R. Perez-Esteve and L. Schuknect, op. cit., page 11.

[40] Soete, L.L.G. and K. Kamp, "The bit tax: The Case for Further Research", *Science and Public Policy*, vol. 23, no. 6, December, pp. 353–360 put forward the idea of putting a nominal tax on each byte a user sent across the Internet. Due to the large volume of data transmitted daily over the Internet, even a small tax would represent an important source of fiscal revenue. This idea has been heavily criticized.

Section II — Legal aspects of e-commerce

Electronic commerce raises a number of legal issues. Questions and uncertainties concern the validity, legal effect and enforceability of transactions conducted through electronic means, in a legal environment based on paper.

The existing requirements in national and international law for the use of written documents or manual signatures in international trade transactions are considered to constitute major obstacles to the development of electronic commerce at global level.[41] Other areas involving legal issues relevant to electronic commerce include: data protection, taxation, customs duties, security and authentication, intellectual property rights, liability of Internet service providers, illegal and harmful content, Internet governance, electronic payment systems, consumer protection, jurisdiction, applicable law and dispute resolution mechanisms.[42]

Although there is a general consensus that electronic commerce is not taking place within a legal vacuum for which a totally new legal framework needs to be created, it is as well acknowledged that there is a need to adapt the existing laws and regulations to accommodate electronic commerce. This would increase legal certainty and boost the trust of both businesses and consumers in electronic commerce.

The following is a brief account of the main legal issues, which are regarded as creating obstacles or uncertainties in an electronic environment.

Commercial law issues [43]

Requirement for a "written document". Most national laws and international conventions include provisions requiring certain transactions to be concluded or evidenced in writing or certain information to be presented in writing. A writing may be required for a variety of reasons. If it is required as a condition of validity of the contract, failure to comply with the requirement would render the transaction null and void. If, on the other hand, a writing is required by law for evidentiary purposes, the absence of a writing will not generally affect the validity of the contract but its enforceability in the event of litigation.[44]

National or international legislation, however, often refers to "writing" or "document" without providing a definition of these terms. In such a case, it is assumed that a written document was envisaged by the drafter, as that was the only format available.[45]

Requirement for "signature". A signature or other form of authentication is normally required to establish the identity of the signatory and his intention to associate himself with or be bound by the contents of the document. The most common form of authentication required by law is a manual signature. The more recent national laws or international

[41] See "Electronic Commerce: Legal Considerations", UNCTAD/SDTE/BFB/1 of 15 May 1998 para. 87.

[42] See UNCTAD Report "Legal Dimensions of Electronic Commerce", TD/B/COM.3/EM.8/2 of 4 May 1999.

[43] The commercial law issues are subject to a more detailed description, in the UNCTAD secretariat document. "Electronic Commerce: Legal Considerations", paras. 91–179. The following is an extract from this document.

[44] *Ibid,* para. 91.

[45] *Ibid*, para. 93.

conventions, however, permit the required signature to be made by other forms of authentication such as stamp, perforation or facsimile, or by electronic means.[46]

The signature requirement, closely linked with the use of paper documents, remains nevertheless as a major obstacle to the growth of electronic commerce.[47]

Requirement for an "original". The requirement that certain information or documents be presented in an original form is regarded as creating an important obstacle to the development of electronic commerce. Indeed, since the concepts of "writing", "signature" and "original" are closely interlinked, the requirement is often for a written, signed, original paper document. An original may be required in order to ensure the integrity of a document and that the information presented in a document has not been altered.[48]

Information security and message authenticity are of paramount importance in an electronic environment. The absence of a paper document and a handwritten signature makes it difficult to distinguish the original message from a copy. The need for some form of security procedure is even more pressing in the context of open network communication systems such as the Internet.[49]

Evidential value of data messages. The issues of the admissibility and evidential weight of electronic messages in judicial and administrative proceedings play a central role in the development of electronic commerce. While the rules governing the admissibility of evidence in certain jurisdictions are rather flexible, there are legal systems that adopt a relatively strict approach to the subject and exclude electronic messages as acceptable evidence.[50]

Storage of data messages. The requirement for storage of certain documents or information in paper form for accounting, tax, audit, evidence and other legal or administrative purposes constitute an additional barrier to the development of electronic trading.

Document of title/negotiability. Replacement of negotiable documents of title, such as bills of lading, by an electronic equivalent constitutes the most challenging aspect of implementing electronic commerce in international trade practice. This is due to the attributes of the negotiable document: transferability, title bearing and tangibility. The legal rules that govern negotiable documents (e.g. bills of lading) premise rights in goods, on the physical possession of an original paper document. The challenge is the replacement of negotiable documents with all the legal effects attached to the piece of paper. There is therefore a need for a legal regime to allow the parties to transfer legal right in goods, such as ownership rights, through the exchange of electronic messages.

Validity and formation of contracts. Although as a general rule a contract concluded orally is valid in most legal systems, a number of questions and uncertainties arise in the context of contracts concluded by electronic means. Questions arise as to the validity of such contracts, especially where there are legal requirements for writing, signature, etc., the time and place of formation of such contracts, the proof of the terms of the contract in case of dispute, and so on. The time when the contract is formed is important in determining the passing of property and transfer of risk of loss or damage in case of sale of goods. The

[46] *Ibid*, para. 102.

[47] See for further discussion the ECE publication "Trade Data Elements Directory", vol. III, "Authentication of Trade Documents by Means other than Signature", ECE/TRADE/200, pp. 86–94. See also UNCITRAL documents A/CN.9/265, paras 49–58; A/CN.9/933, paras. 50–59; A/CN.9/390, paras 86–89 and A/CN.9/W6.IV/WP.53, paras. 61–66.

[48] Electronic Commerce: Legal Considerations, para. 114.

[49] Electronic Commerce: Legal Considerations, para. 60.

[50] *Ibid*, para. 121.

place when the contract is concluded may determine which national law is to govern the contract in the absence of an effective choice of legal provisions as well as establishing jurisdiction in case of litigation.[51]

Incorporation of general terms and conditions. A further question that arises in the context of electronic commerce, is the incorporation of general terms and conditions of underlying contracts, generally found on the reverse side of paper documents, such as bills of lading and other standard form contracts. Since in the electronic environment no reverse side of the document exists, the achievement of an acceptable solution becomes crucial for the development of electronic commerce.[52] The United Nations Commission on International Trade Law (UNCITRAL) Model Law on Electronic Commerce, adopted in 1996, aims at providing national legislators with a set of legal principles and guidelines for removing some of the above uncertainties and issues referred to in this section.[53]

Intellectual property issues

The implementation of trademark, copyright and patent protection in an electronic environment, constitutes a serious challenge for the development of electronic commerce. To deal with some of the intellectual property protection issues raised by electronic commerce, the World Intellectual Property Organization (WIPO) adopted the WIPO Copyright Treaty and the Performances and Phonograms Treaty in December 1996.[54] These WIPO treaties contain a general update of the legal principles underpinning international protection of copyright and the rights of performers and phonogram producers on the Internet. In addition, they clarify that national law must prevent unauthorized access to and use of creative works which, given the global reach of the Internet, may be downloaded anywhere in the world. Discussions continue in WIPO aiming at the adoption of a Protocol on Audio-Visual Performances and of a Treaty on Intellectual Property in Databases.

Another important area in the intellectual property field is the allocation of domain names. In 1988, WIPO launched an international process of consultation to develop recommendations concerning the intellectual property issues associated with Internet domain names, including dispute resolution. The Final Report[55] and the recommendations arising from the WIPO consultation process were also submitted to the Internet Corporation for Assigned Names and Numbers (ICANN).[56]

The WIPO Arbitration and Mediation Center has developed an Internet-based, online dispute-resolution system to provide a neutral, speedy and cheap means of resolving

[51] *Ibid*, para. 163.

[52] *Ibid*, para. 172.

[53] For more information on the UNCITRAL Model Law, see Section III of this document

[54] For the full text of the Conventions see http://ecommerce.wipo.int/activities. At least 30 States must adhere to each of the treaties before they enter into force. Information regarding WIPO's programme of work and activities concerning intellectual property and electronic commerce could be found in http://ecommerce.wipo.int

[55] See WIPO Publication No. 439, 30 April, 1999. Available at http://wipo2.wipo.int

[56] ICANN was formed in November 1998 as a non-profit, private sector corporation formed by a broad coalition of the Internet's business, technical and academic communities. ICANN is responsible for overseeing the management of the Domain Name System (DNS), which allows Internet addresses (e.g. web pages and email accounts) to be found by easy-to-remember names, instead of numbers. ICANN has been designated by the United States Government to serve as the global consensus entity to which the U.S. Government is transferring the responsibility for coordinating the management of the domain name system, the allocation of IP address space, the assignment of protocol parameters, and the management of the root server system. For more information about the Internet domain name process, see: http//ecommerce.wipo.int/domains/process.

disputes arising out of electronic commerce. Furthermore, a "Domain Name Dispute Resolution Service"[57] has been established for the resolution of disputes arising out of the abusive registration and use of Internet domain names.

In recognition of the major economic and policy importance of electronic commerce for intellectual property rights, a WIPO Digital Agenda was adopted by WIPO's General Assembly in September 1999.[58]

Consumer protection

Electronic commerce offers unprecedented opportunities to consumers to purchase goods and services from suppliers abroad. This also creates new challenges as regards consumer confidence and consumer protection rules. Although most of the problems are not new in character, the tremendous increase in the volume of consumer transactions with foreign firms gives the problem a new dimension. Limited or non-existent face-to-face contact between business and consumers increases the need for an effective global approach to consumer protection.[59] It is generally recognized in this context that electronic commerce will not reach its full potential until consumers are assured that the online environment is a safe and predictable place for them to do business. It is important in this respect that consumer laws, policies and practices assist in building consumer trust by protecting consumers from unfair or deceptive acts or practices, helping to establish a more balanced relationship between sellers and consumers in commercial transactions.[60] To assist in protection of consumer rights, and enhance consumer confidence in electronic commerce, the OECD is currently involved in the preparation of a set of guidelines for action at national level.

Taxation

The development of a taxation framework is considered a high priority for both Governments and businesses. It is important to ensure that the taxation systems are fair and predictable, and that they do not distort the conduct of business. The implementation of a taxation framework for electronic commerce and the administrative arrangements that will support that framework are considered priorities by the OECD's Committee on Fiscal Affairs.[61] There seems to be a general consensus that the taxation principles that guide Governments in relation to conventional commerce should also apply to electronic commerce. This approach would not preclude new administrative or legislative measures relating to electronic commerce, provided that those measures are intended to assist in the

[57] The center's domain name dispute resolution services gives effect to the "Uniform Domain Name Dispute Resolution Policy" adopted by ICANN on 26 August 1999, and the "Rules for Uniform Domain Name Dispute Resolution Policy" approved by ICANN on October 24, 1999. See http://arbiter.wipo.int

[58] See http://ecommerce.wipo.int/agenda/index.html.

[59] See OECD, "Consumer Protection in the Electronic Market Place", OECD Document DSTI/CP(98) 13/Rev. 2 of 21 September 1998: 3.

[60] In the European Union, the existing body of law and policy on consumer protection is generally applicable to electronic commerce and covers all the stages of the business-to-consumer commercial relationship, including commercial communications (advertising, promotion and marketing) of goods or services, (pre-) contractual information and disclosures, contract formation, payment, delivery, guarantees and after-sales services and, ultimately, redress. See US Perspectives on Consumer Protection in the Global Electronic Marketplace. Comments by the European Union, 21 April 1999, paras. 7–8.

[61] See "Electronic Commerce: A Discussion Paper on Taxation Issues", paper prepared by the OECD's Committee on Fiscal Affairs for discussion at the OECD Government/Business Dialogue on Taxation and Electronic Commerce held in Hull, Quebec on 7 October 1998. The paper identifies the broad taxation principles which should apply to electronic commerce.

application of the existing taxation principles, and are not intended to impose a discriminatory tax treatment of electronic commerce transactions.[62]

Data protection

Data collection and data processing are inherent in electronic. While data processing offers benefits, it also allows the creation of detailed online user profiles that track online activities and electronic transactions that threaten privacy. In consultation with the private sector, the OECD has begun to examine specific issues raised by the basic privacy principles of the 1980 OECD Guidelines on the Protection of Privacy and Transborder Flows of Personal Data, in relation to global networks. The effective Implementation of the Guidelines in today's networked world constitutes another important challenge for building trust in electronic commerce.[63]

Trade related issues

Although it is clear that products that are bought and paid for over the Internet but delivered physically are subject to the existing WTO rules on trade in goods, the situation becomes more complicated as regards products that are delivered as digitized information over the Internet. Given the projected large expansion of electronic commerce, it seems important to determine how the WTO provisions apply to the various forms of electronic transaction in order to assess whether there may be a need to clarify certain WTO provisions when they apply to electronic trade. Furthermore, it is very likely that the present moratorium on the application of customs duties to electronic transmissions[64] will probably be extended in order to avoid discriminatory restrictions affecting the development of electronic commerce. Another key issue pertaining to electronic commerce that is likely to be tackled involves reviewing WTO rules on domestic regulations that affect trade. It seems, however, that various existing exceptions to WTO rules touch on sensitive electronic commerce issues, such as protection of privacy, prevention of fraud and protection of public morals.[65]

Applicable law and dispute resolution

It is generally recognized that the development of appropriate dispute resolution mechanisms and a framework that allow operators to know in advance what law will be applicable to their transactions constitute an important challenge essential for the development of electronic commerce. The existing dispute settlement mechanisms do not very often provide a satisfactory solution for resolution of disputes arising from electronic commerce.[66] This is the case in the context of consumer transactions, where in many

[62] See "Electronic Commerce: Taxation Framework Conditions", report presented at the OECD Ministerial Conference:". A Borderless World: Realising the Potential of Global Electronic Commerce, Ottawa, 8 October 1999.

[63] See Report of the OECD Forum on Electronic Commerce, Paris, 12–13 October 1999: 14.

[64] See Declaration on Global Electronic Commerce adopted on 20 May 1998 at the second session of the WTO Ministerial Conference, Geneva, 18–20 May 1988. Document WT/MIM/98/Dcec/2 of 25 May 1998, available at http:/www.wto.org.

[65] Tuthill L., "Electronic Commerce for users and consumers: Expanding Global Market: The Road Ahead"; OECD Report: 33.

[66] While in a "closed network", solutions could be found in the governing "interchange agreement" between the parties as to applicable law and dispute settlement (e.g. clauses 7.1 "Governing law" and 7.7 "Dispute Resolution" of the ECE Model Interchange Agreement). The situation is more complicated in "open networks" such as the Internet, where uncertainties about the identity and whereabouts of the parties remain important factors.

countries[67] the consumer could sue in his own jurisdiction. The nature of electronic commerce makes this solution impractical for companies that offer goods and services worldwide, which could face the possibility of being sued in various parts of the world. On the other hand, there is also a problem in applying arbitration as a mechanism for consumer items of small value.[68] To assess the pertinence of existing norms governing applicable law and jurisdiction in an electronic environment, the Permanent Bureau of the Hague Conference on Private International Law convened a Round Table on Electronic Commerce and Private International Law in Geneva in September 1999. The recommendations adopted at the Meeting[69] will be relevant for the current negotiations on a worldwide Convention on jurisdiction and the effects of judgments in civil and commercial matters.

Section III — Electronic commerce in transport services

Electronic commerce has been broadly defined to refer to any form of commercial or administrative transaction or information exchange that is transmitted by electronic means. This could be by phone, fax, television, EDI, Internet, and so on, although much of current policy discussion centres on transactions undertaken over the Internet. Concern about e-commerce also relates to institutional arrangements and activities that may influence and be affected by electronic exchange of commercial information.

Transport services have a market in which services are sold and bought in the same way as goods. The sale and purchase of transport services over the world's transport chains involve the application of e-commerce solutions and information technologies. Many major transport service providers now make agreements with information-technology companies that supply them with information systems for their operations. These operations include, for example, ordering, booking freight or travel, billing, charging tariffs, customs clearance, insurance claims and so on.

The purpose of this section is to examine the nature of electronic commerce transactions in transport services, that is, all the processes in the selling and buying of transport services, from the origin to the destination of the products being transported. It provides examples of information technologies that have developed in the transport industry. It also shows how electronic commerce as a whole is affecting the transport industry and, vice versa, how the supply of transport services may facilitate or impede electronic commerce generally. In examining developments in e-commerce and transport services, the section largely focuses on the state of the art, which is found, for the most part, in developed countries. While developing countries face severe constraints in achieving the state of the art, the intention here is to portray the opportunities and challenges facing them.

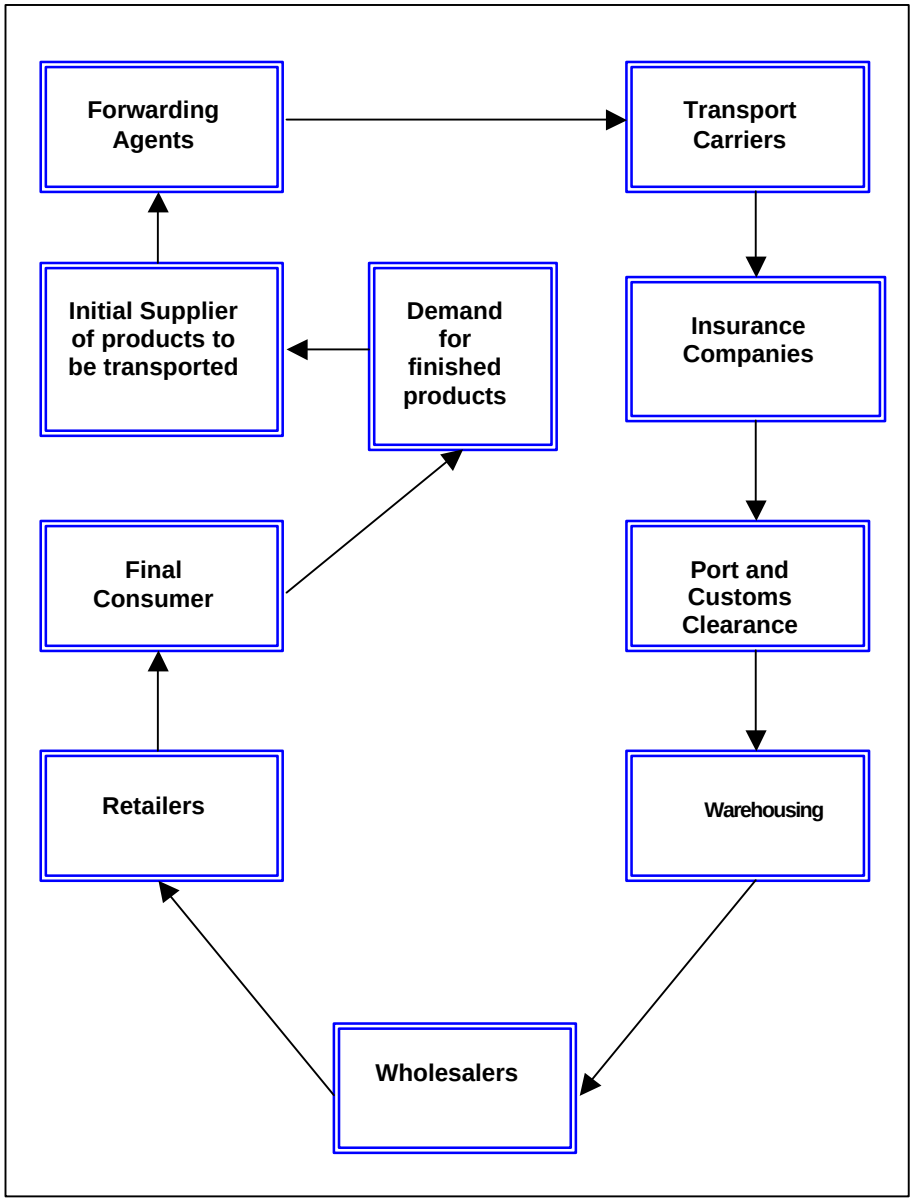
Finally, the section describes the implications of the developments in e-commerce and transport for participation by enterprises of developing countries. It also identifies possible strategies for promoting their participation in providing transport services for e-commerce.

[67] This is the principle that applies according to the Brussels Convention on Jurisdiction and the Enforcement of Judgement in Civil and Commercial Matter, 27 September 1968 and the Lugano Convention of 16 September 1988.

[68] In the case of *Brower V. Gateway 2000, Inc.*, 676 N.Y.S. 2d 569, 1998 N.Y. App. Div. Lexis 8872, heard in the Supreme Court of New York in 1998, which concerned a consumer item of reasonable value (around $ 2 000 or $ 3 000), the court held that it was unconscionable, a clause mandating ICC arbitration, since the costs of the deposit for the arbitration would exceed the value of the transaction itself.

[69] The full report of the Round Table will be available on the web site of the Hague Conference at http://www.hcch.ne.

Figure 8. Representation of a transport chain



The present section focuses only on electronic commerce in freight transport. A discussion of electronic commerce in travel and related activities, especially tourism, will be dealt with in a separate paper.

Electronic commerce in freight transport services

The main perceived benefits of e-commerce are the reduction in transaction costs, a greater ability to streamline operations and an overall improvement in efficiency. Through such improvements, enterprises of all sizes, including small ones, are able to access new markets, increase competitiveness and create product or service differentiation. This chapter first describes the main parties involved in transport service transactions, in order to place the linkage between commerce and transport in perspective. Then it gives examples of functions and transactions in freight transportation that employ information and communications technology. For each example, the benefits or the nature of the reduction in transaction costs implied are described.

Main participants in transport markets

In the discussion of e-commerce, three main types of e-commerce transactions are normally identified — business to business; business to consumer and Government to business/consumer. Within these general categories, transactions for transport services can be described in terms of transport chains through which goods, services and information flow, and in which businesses, consumers and Governments participate. A simplified illustration of a transport chain is given in Figure 8 above.

Along the chain is a multitude of activities ranging from ordering, invoicing, agency functions, warehousing, shipment, insurance, customs clearance, distribution and wholesaling to retailing. The performance of these activities involves many stakeholders who have to exchange data and information and make payments between them. Taken as a whole, these activities constitute complex linkages between different enterprises and involve a variety of types of information to be exchanged. Traditionally, these functions were performed through the transfer of paper documents and manual processes. This was not only slow but it was also difficult to integrate the processes taking place at different points on the transport chain. The introduction of information and communications technology have brought considerable efficiency, allowing reduction in the length of time for processing transactions between the different parties on the transport chain. They also make all the processes on the chain more “visible” to all stakeholders.

To relate transport to e-commerce, it is also essential to identify the types of goods involved. Electronic commerce involves two broad types of goods. First are products for which all elements of transactions (advertising, ordering, billing, purchasing, payment and distribution) may be completed electronically. Examples of these goods are software, newspapers, music, films, customer services, games, videos and so on. The second type includes goods for which some or most transactions can be effected electronically, but the actual delivery to destination requires the use of physical transport facilities. This paper focuses on those goods requiring physical transport.

Table 5. gives projections of United States inter-company (business-to-business) trade of hard goods (deliverable via physical transportation) concluded over the Internet. It is projected that the value of such trade will reach US$ 1.3 trillion by 2003. Other projections show that worldwide Internet commerce (of hard and soft goods) will reach US$ 3.2 trillion over the same period. These figures suggest that Internet-based trade in goods requiring physical transportation will represent a considerable share of total e-commerce, especially considering that the figures in Table 5 include United States e-commerce alone.

Table 5. Projections of United States inter-company trade in hard goods over the Internet, 1998–2003, *in billions US $*

	1998	1999	2000	2001	2002	2003
Total billions	**43.1**	**109.3**	**251.1**	**499.0**	**842.7**	**1330.8**
Computing/electronics	197.7	50.4	121.4	229.1	319.1	395.3
Motor vehicles	3.7	9.3	22.7	53.2	114.3	212.9
Petrochemicals	4.7	10.3	22.6	48.0	96.8	178.3
Utilities	7.1	15.4	32.2	62.9	110.6	169.5
Paper/office products	1.3	2.9	6.4	14.3	31.1	65.2
Shipping/warehouse	1.2	2.9	6.8	15.4	32.7	61.6
Food and agriculture	0.3	3.0	6.3	13.1	26.7	53.6
Consumer goods	1.4	2.9	6.1	12.7	26.0	51.9
Pharmaceutical and medical	0.6	1.4	3.5	8.5	20.0	44.1
Aerospace and defence	2.5	6.6	14.8	25.6	34.0	38.2
Construction	0.4	1.6	3.4	7.0	14.2	28.6
Heavy industries	0.1	1.3	2.3	4.7	8.7	15.8
Industrial equipment	0.1	1.3	2.4	4.5	8.5	15.8

Source: Forrester Research, Inc.

Transport service transactions employing electronic commerce

What follows is an examination of selected examples of transport service transactions or related functions carried out by using information and telecommunications technology. The examples cover all modes of transport. While emphasis is placed on transaction or functions that rely mainly on the Internet for transmission of information, methods employing other methods of electronic transmission are also examined.

Transportation exchange

Traditionally sellers and buyers of transport services have used agents and brokers to seek cargo and shipping space, respectively, to meet their requirements. The role of the agent is to bring together those offering cargo and those offering shipping capacity. This process took much time, as agents had to go back and forth to match the requirements of a multitude of shippers and carriers. A number of firms have now established websites where carriers and shippers can buy or sell transportation services. For example, shippers can bid on container space offered by carriers and provide information on their needs to various carriers. They can search online the resulting offers and select the ones offering the most competitive rates or other transport conditions. Conversely, carriers can bid on shippers" available cargo and provide information on unsold capacity for shippers wanting to buy.[70]

The Online sales of transportation services makes it possible for carriers and shippers to quickly post their offers for cargo and shipping space worldwide at very low costs. The

[70] There are several companies which offer spot, online freight transport sales, for example Celarix, dealing in maritime transportation, and National Transportation Exchange, which arranges backhauls for trucking services. Both are US-based companies.

system is also flexible since the shipper or carrier may, for example, make offers only to the parties they designate on the web. Since this type of exchange provides a real-time market, carriers and shippers are able to negotiate offers on the basis of the most up-to-date, market-driven freight rates.

Shipment tracking

Shipment tracking is a function commonly used by transport service providers employing interactive Internet applications. All shippers have, in a sense, an interest in the movement of their consignments. However, the pioneering work and the greatest demand for shipment tracking appears to have developed in express or parcel delivery services. Tracking-related applications now constitute a very significant share of Internet applications used in freight transport services. While it is most widely used in express and parcel delivery transportation, freight forwarders, motor carriers, air cargo carriers, rail carriers, ocean carriers and other transport service providers also use it.

Shipment tracking involves global positioning systems, which keep track of vehicles so that customers can find out exactly where the shipment is located at a given time. An integral part of shipment tracking is the use of bar coding that is used to identify individual packages or consignments. Each package can be scanned at various points on the transport chain. Drivers or other delivery employees may use hand-held computers, which scan the parcels' bar codes, signatures of receivers and the time of delivery. This information is then transmitted directly to the carriers' central computers. Thus records of a parcel's location are monitored at all times, from the time of pickup at the origin to the final destination point. In case the package is misplaced and can't be located, the records make it easy to focus a search. Transport service providers offer customers tracking possibilities through telephone, interactive touch-tone systems or the World Wide Web. To receive information about the status of a package, the customer accesses the service provider's site and types the number of their package. The transmission of the information on shipments may be tailor-made to suit the customer's requirements. For example, a customer may select a high frequency of transmission of shipment status data, such as every hour or two. At the other extreme, the transmission of the messages may be limited to pick-up and delivery notification.

Shipment tracking enhances the ability of the carrier to find consignments and to re-direct stray consignments. It enhances transport reliability and reduces the incidence of losses or theft. Also it enables customers to receive accurate information about the movement of their consignments and the expected arrival time.

The value of shipment tracking is not limited merely to the ability to know the location of a consignment. In business-to-business transport services it also enables enterprises to manage the flow of shipments electronically and thus achieve more efficient and informed management of inventory and restocking, as well as production-line operations, marketing and customer services. For example suppliers may be able to divert intermediate goods already in the pipeline to locations where supply is more critical.

While shipment tracking offers considerable benefits, its technology is reported to be very costly. It is therefore evident that only big carriers or delivery service providers can provide shipment tracking. Also the feasibility of the system is to a large extent governed by the market. It is likely to pay off where customers demand guaranteed delivery at specified times and are prepared to pay the premium. It may also be justified for tracking consignments, which should not be lost or delayed for reasons such as high replacement costs, safety, and so on.

Other forms of tracking

In addition to shipment tracking, transport enterprises also use the Internet and other electronic means to enable their customers to track containers and other transport equipment located at various depots, to determine if they are able to meet customers" requirements. In the rail industry, for example, Internet-based applications allow shippers to locate specific freight rail cars, showing their location, and details of the shipper, consignee, commodity shipped, and so on. In maritime transport, a number of large carriers and seaports are introducing Internet applications to track vessels in order to provide real-time information on the location of vessels and departure dates. In airfreight transport, carriers and freight forwarders are offering customers Internet-based flight tracking, so that it can be combined with shipment tracking.

Bills of lading

A bill of lading is a contract between the transport carrier and the shipper and contains details of shipment, including shipper, consignee, freight charges, purchase number; and it may also contain special instructions. Carriers now provide Internet-based systems in which the shipper can prepare the bill of lading, in advance, on computer. The carrier may provide shippers with Internet access to view, print out and submit bills of lading from the carrier's website. The information on the bill of lading can be transmitted to the consignee in advance of the cargo's arrival, thus enabling them to know what is being shipped.

The ability to place the bill of lading on the Internet means that in addition to its traditional role as a contract, it provides carriers, shippers and consignees with data and information which they can use to schedule and record shipments and to process transactions through the transport chain.

A number of initiatives are expected to introduce electronic methods in processing trade documents and provide supply chain information on a global basis. These include the Bolero project (named after Bill of Lading Electronic Registry Organisation). Its objective is to establish a global electronic network to handle trade documentation such as bills of lading and other non-negotiable documents. The project has launched, on a trial run, a central electronic registry and encrypted digital signatures to replace paper bills of lading.

Another development is the General Electric Information Services (GEIS). In partnership with Ocean Wide, Incorporated, General Electric is marketing a system that provides an e-commerce solution which allows shippers, trucking companies and freight forwarders to exchange trade documents with ocean carriers and the US Customs. Yet another development is the Microsoft Value Chain Initiative which attempts to bring together software, hardware and supply chain companies to establish an integrated architecture that will promote data sharing among different software applications and among trading partners on a global basis, regardless of the format or communications method, and to integrate these communications with operational systems.

Tariffs

Transport carriers, especially in maritime transport, have traditionally used complex pricing structures; and the rates charged to the shipper are a function of many factors, including value, weight, stowage factors, port conditions, and so on. Carriers publish tariffs for individual commodities and trades, resulting in the publication of voluminous tariff books. As markets change the tariffs are constantly amended, producing additional costly paper work which has to be distributed to agents and shippers.

Some transport service providers as well as third party firms now offer tariff information on the Internet. The information is made available on the carriers' or firms' websites. Some of them may provide online "calculators", enabling the shipper to input details such as cargo

origin and destination, cargo characteristics, and so on. This “calculator” provides the required freight rate instantly. These systems are fully interactive and provide considerable benefit to shippers by simplifying and expediting numerous tasks involved in freight rating, which would otherwise involve considerable time, cost and human resources to complete.

Customs clearance

Internet technology is being applied by a variety of service providers to provide customs clearance, including airfreight carriers, motor carriers, freight forwarders, customs brokers, express delivery firms, and so on. Electronic customs clearance makes it possible to begin processing clearance before shipment arrives. This means that goods can be cleared through customs almost immediately upon arrival. It also makes it possible to eliminate hard-copy invoices, thus providing cost savings to shippers through faster and more accurate customs entries.

Freight manifests

Some service providers employ electronically-based billing and cargo manifests. For example, the US Customs Service supports an EDI-based system for ocean cargo which can report, electronically, the cargo manifest, bill of lading and other shipping-related information. This online data system has proved to be beneficial in permitting quicker cargo release and increased carrier productivity through reduced cargo-processing time. It has also helped some port authorities to become more competitive by reducing cargo customs clearance and processing times.

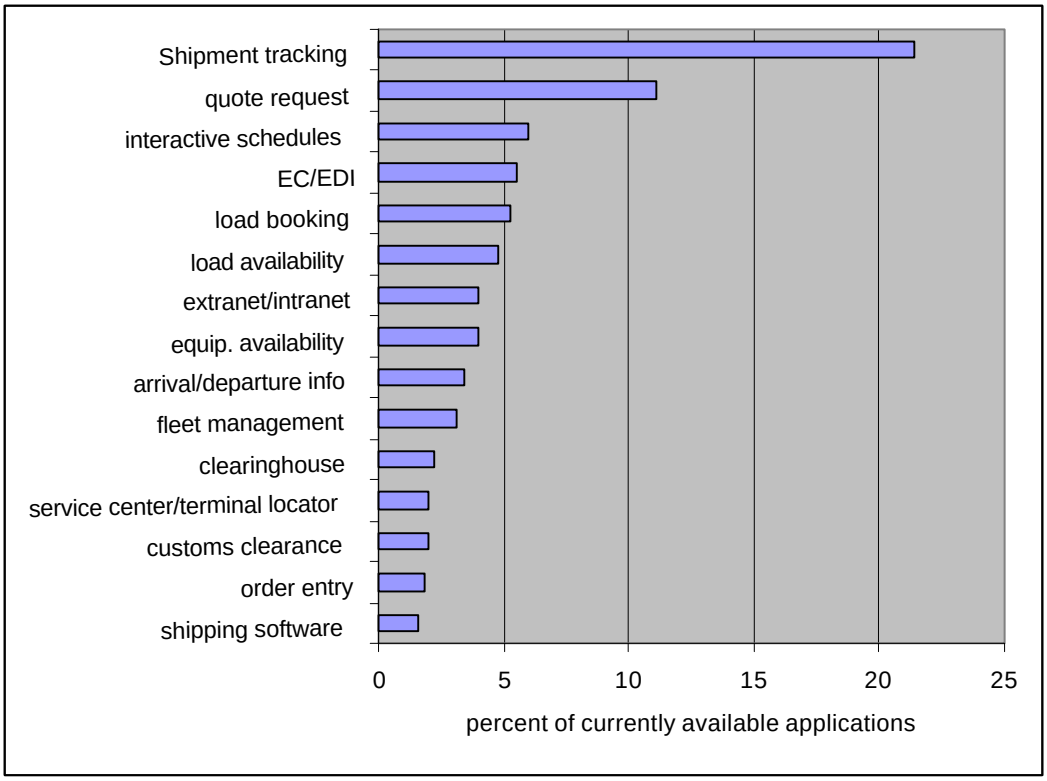
Port services

Several maritime ports around the world, including those of New York, Rotterdam and Hamburg are establishing electronic systems which link up various parties engaged in the movement of freight through the port, including shippers, forwarders, customs, terminal operators, carriers and other port users.

Summary

In addition to the applications outlined above, a number of others are being applied in the freight transport market. Figure 8 provides a summary of the leading Internet applications being applied in the global freight transport market. Table 6 shows the main sectors in which the Internet is applied in the freight transport market.

Figure 8. Distribution of leading Internet applications in the global freight transport market



Source: Transport Technology Publishing, "Freight@Internet: The impact of Internet technologies in the freight transport market", 1999.

Table 6. Main industry sectors in which the Internet is applied in the freight transport market

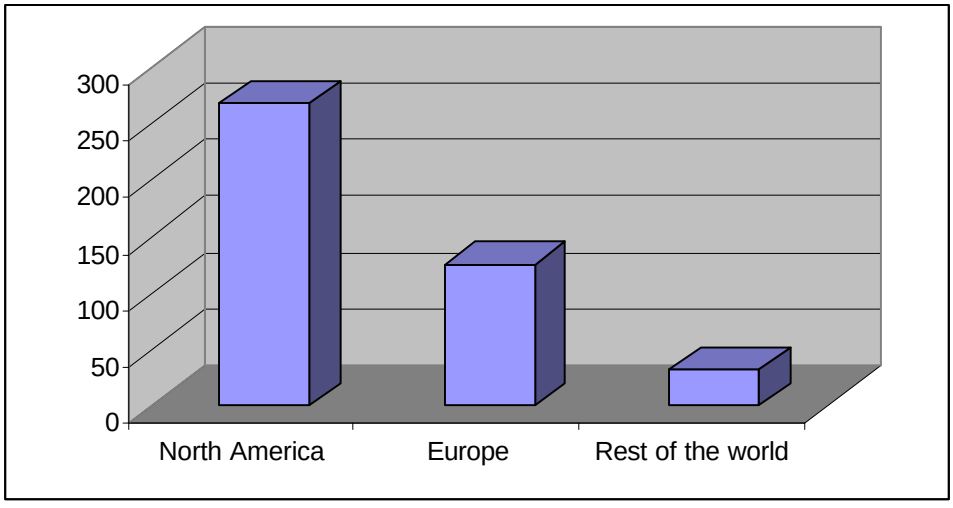
	Application Total	Company count	Application per company
Technology vendors	188	95	1.98
Motor carriers	143	65	2.2
Service providers	119	53	2.25
Freight forwarders	115	58	1.98
Express Delivery	57	17	3.35
Maritime ports	52	28	1.86
Maritime shipping lines	49	21	2.33
Air cargo carriers	48	25	1.92
Third party logistics	40	24	1.67
Rail carriers	35	15	2.33
Airports	13	7	1.86
Container leasing	11	3	3.67
Shippers	8	4	2
Household goods movers	7	4	1.75
Terminals	5	1	5
Customs brokers	2	2	1
Regulatory agencies	2	2	1
Warehouse/ DCs	1	1	1
GRAND TOTAL	895	425	2.11

Regional and sectoral patterns of development in electronic commerce in freight transportation

It has been observed that e-commerce is characterized by a high degree of inequality. The bulk of e-commerce is concentrated in OECD countries, while developing countries are still marginal participants, although some of them are showing appreciable growth. Developments in freight transport services mirror this wider picture. Most of the developments outlined in section I are concentrated in OECD countries, while developing countries are lagging far behind.

Reliable and comprehensive data on the distribution of e-commerce in freight transportation across regions is not readily available. However, a few studies have documented the usage of Internet technology in the freight transportation industry and these shed some light on existing regional patterns. For example, Transport Technology Publishing (TTP) have published data for 425 firms surveyed in North America, Europe and the Asia Pacific region.[71] Their survey showed that around 63 per cent of the worldwide Internet activity in freight transport occurred in the United States and Canada, around 29 per cent in Europe and 8 per cent in the rest of the world. These figures are based on TTP's selection of companies, which it identified as offering legitimate freight transport business services over the Internet. To some extent the figures might be biased in so far as the selected sample of companies did not cover all regions of the world. Despite this, the results conform to what would be expected, given the overall distribution of Internet use around the world.

Figure 9. Regional distribution of Internet activity in freight transport by companies offering transport business over the Internet



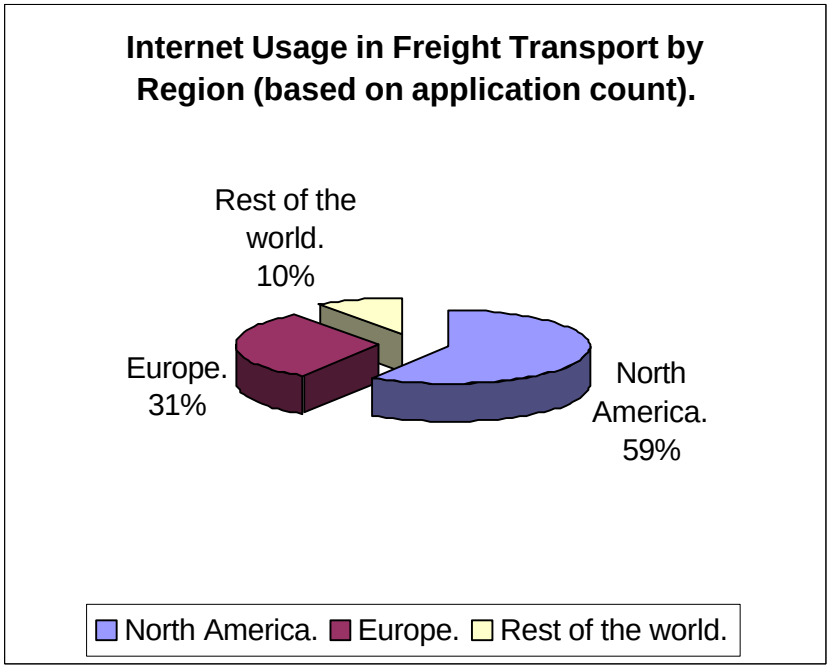
Source: Transport Technology Publishing, op.cit. 1999

In addition to the regional distribution of companies, the TTP study also provides data on the regional distribution of freight transport applications making use of Internet technology. It shows that out of a total of 895 major freight transport applications, 59 per cent were

[71] Ailing, Philip and Grant Klein, "Freight @Internet: The impact of Internet technologies in the freight transport market", *Transport Technology Publishing*, 1998.

employed in North America, 31 per cent in Europe and 10 per cent in the rest of the world. Finally, table 7 shows the list of main express delivery companies engaged in e-commerce and their regional locations. It provides further illustration of the uneven pattern of regional distribution.

Figure 10. Regional distribution of Internet usage in freight transport by number of applications used



Source: *Transport Technology Publishing, op.cit.*, 1999.

Table 7. Main express delivery companies engaged in e-commerce

COMPANY NAME	REGION
Airborne Express	North America
BAX Global	North America
Canada Post Corp	North America
DHL Worldwide Express	North America
Emery Worldwide	North America
Federal Express	North America
The Freight Escape	North America
Pirplator Courier	North America
Roadway Package	North America
UPS	North America
US Postal Service	North America
DHL Worldwide Net	Europe
FedEx Europe	Europe
Jet Services Worldwide	Europe
Securicor Omega	Europe
TNT Express	Europe
UPS WW Logistics	Europe

Source: Based on Transport Technology Publishing, "Freight@Internet : The impact of Internet technologies in the freight transport market", 1999.

Interrelationship between e-commerce and transport services

The previous section has described information technologies and especially Internet-based approaches being employed in freight transportation services. This section examines how transport services may influence developments in e-commerce and how, in turn, developments in electronic commerce exert influence on transport services.

Transport services as facilitator of or impediment to e-commerce

One of the main attributes of e-commerce is the speed at which orders have to be fulfilled. Customers expect their orders to be processed and delivered as quickly as possible. Fast online marketing makes sense if it is matched by quick and reliable delivery.

Some observers point out that the future pace of growth and profitability of e-commerce for physically transported goods, especially in business-to-consumer transactions, will hinge heavily on the ability of online retail sales to be fulfilled. In this regard, it has been pointed out that existing supply chain systems were not designed for Internet retailing. For example, equipment, warehousing and other facilities designed to handle large consignments are often used to move small packages.

Also business-to-consumer e-commerce involves more direct interaction between the supplier and final consumer, which is a major change from the traditional supply chain which relied on intermediaries. In this new situation many online retailers do not possess the logistics networks needed to meet the requirements of e-commerce consumers. Many have to employ the services of third party logistics providers. However, even the traditional third party logistics providers have to adapt and make organisational changes and new investments in warehousing and distribution networks that can handle e-commerce shipments.

It would therefore appear that the current period is one in which e-commerce retailers and transport and logistics service providers are searching for solutions that will ensure that e-commerce shipments are handled and transported at costs which produce profits. Reducing transport and logistics costs for e-commerce shipments may be constrained by a number of factors. Many individual business-to-consumer e-commerce orders tend to be small and thus the cost of shipment may be quite large relative to the unit value of the goods being shipped, making transactions unprofitable. Also the rapid increase in the number of online customers means that the transport and logistics requirements can't be predicted and planned with ease. Thus, at least for the time being, there may be a tendency to either under-invest or over-invest in facilities.

Another factor that may pose problems for retailers is the density of e-commerce traffic, especially for business-to-consumer home delivery services. As residences tend to cover large city areas, an increase in home deliveries may mean greater driving distances covered by delivery vehicles per package delivered. This reduces productivity and hence lowers profits.

To shed light on the importance of order fulfilment in e-commerce, Forrester Research Incorporated surveyed 40 United States companies using online sales in retail, Internet and manufacturing businesses.[72] The companies indicated that on average they were handling 400 orders per day online. While their online sales accounted for a small share of their total business, the companies reported that handling merchandise (a function that includes transportation and delivery) was a major problem. Less than half of the respondent

[72] Forrester Research , Inc. "Mastering Commerce Logistics", 1999.

companies made money on each shipped package and most of them failed to measure the total cost of fulfilling an order.

A large number of those companies losing money on shipping attributed the losses to their company's pricing system, for example charging the same fees for all packages regardless of size or imposing no shipping charges at all. Eighty five per cent of the companies noted that they could not fill overseas orders because of the complexity of shipping across borders. Of those who had problems shipping overseas, 75 per cent cited their system's inability to register international addresses accurately or to price total delivery cost.

The Forrester study notes that order fulfilment has so far not been a serious impediment to e-commerce because most online sellers have limited the number of products offered on their sites and have used in-house capacity to fulfil orders. However, as online sales are expected to reach US$ 3.2 trillion by 2003, with the range of products sold expanding and the need to move large volumes of parcels increasing, there will be increased pressure on the order-fulfilment system. According to Forrester, sellers will face logistics chaos, as they strive to adjust their infrastructure in order to handle the new demands. As a remedy, the Forrester study advocates the implementation of end-to-end logistics in which distribution operations focus on the movement of parcels rather than pallets. However, until such systems are put in place, the report proposes that general merchants build in-house logistics systems and that medium-size sellers outsource the order fulfilment part of the distribution.

The significance of transport and distribution costs is also illustrated, for example, by the existence of enterprises which have established online shopping malls dedicated to connecting consumers with e-merchants that offer products free of shipping and handling charges. Some surveys have indicated that consumers rank free shipping and handling offers as a much greater incentive when purchasing, compared to other price discounts.

The impact of e-commerce on transport services

In assessing the impact of e-commerce on transport services, it should be borne in mind that the transport industry has, over decades, been undergoing organizational and technological changes independent of any influence from electronic commerce, especially from the use of the Internet, which is quite a recent phenomenon. Particularly, developments in industrial production systems and globalization of economic activities have had profound effects on transport. Thus e-commerce tends to reinforce developments that have already commenced in the transport industry.

On the supply side, there is no doubt that e-commerce will call for fundamental changes in various ways. Providers of transport and related logistics services will have to adapt their infrastructure, marketing and customer service, so as to provide support to the electronic market place. The rest of this section examines various features of e-commerce that will have direct implications for the transport industry.

Greater speed in transactions

In e-commerce, transactions are faster than traditional commercial transactions. The identification of products by buyers, comparison of prices, ordering, invoicing, payment and arranging for delivery can be automated and completed over very short periods of time. Traders in e-commerce will inevitably want to link their electronic sales to a transportation or distribution system that meets their requirements. This will in turn put pressure on transportation systems to respond by providing faster, reliable and more frequent services.

Greater number of buyers and sellers

E-commerce makes it possible for transactions to take place without limitations caused by distance between buyers and sellers. This means that sellers can reach a much larger number of customers directly, while buyers get access to potentially unlimited sources of products. Also buying and selling take place without being constrained by availability of space in warehouses, shops, and so on. All this helps to expand the scope of the market and hence the number of "physical" origins and destinations for products to be transported. In turn, this increases the overall demand for transportation.

Greater demand for information and communications technology in transport

Given that the very essence of e-commerce is the processing of transactions by electronic means, it is inevitable that transport services and operations serving e-commerce will also need to rely to a considerable degree on information processed and transmitted electronically. Specifically, there will be increased demand for the application of advanced information and communications technology, in order to optimize the use of existing transport networks. To a very large extent, providers of transport services are already applying state-of-the-art information technology capable of supporting e-commerce. Examples of these were outlined in Section I.

Transformation of the traditional transport chain

Traditionally, the transport chain has consisted of various participants, including suppliers or sellers of goods, agents, providers of transport services, retailers and the final consumer, as depicted in Figure. The emergence of e-commerce makes it possible for a given participant in the transport chain to interact quickly and at low cost with any of the participants on the chain, without following the ordered sequence on the chain. Thus, for example, a carrier can deal online directly with shippers, without using the services of agents. A manufacturer of a product may sell directly to a distant final consumer without going through retailers or sales agents. This clearly opens totally new types of relationships and competitive forces between carriers, shippers and "middlemen" in the transportation chain.

Growth of new transport activities

The combination of greater speed in commercial transactions and the increase in the number of trade origins and destinations will enhance the creation of new features in transportation systems. As sellers will need to respond quickly to orders from buyers, and as direct supplier–consumer interactions increase, sizes of consignments shipped will tend to be smaller, but more numerous. An outgrowth of this will be the expansion of courier and parcel services, specializing in the transportation of small consignments. There will also be increased demand for home delivery transport services. These types of services have enjoyed fast growth in the past and they are expected to get further boost as e-commerce expands.

Expanded transport networks and growth of logistics services

As e-commerce traders have to deal with numerous customers around the world, their transport requirements can be met by getting access to global transport and logistics networks. In this regard, experience has also shown that traders prefer to use service providers that can supply comprehensive and integrated services which traditionally have been supplied individually by forwarders, agents, transport companies, financial and insurance companies, etc. Because of large financial and logistics requirements for operating such integrated services, transport service providers have entered into horizontal alliances with other transport service providers and also vertically with intermediaries such as

forwarders, agents, and insurance and financial institutions. There has also been growth of third party logistics service providers.

Implications for developing countries and possible strategies to be adopted

To be able to make use of the technologies described in Chapter I, buyers of freight transportation must have access to basic telecommunications infrastructure and the Internet. On the other hand, providers of transport and related services must have the capacity to invest in or have access to the physical infrastructure for logistics services and information technologies for handling shipments efficiently.

Strategies for shippers or buyers of transport services

For online buyers of freight transportation in developing countries, the main problems include lack of or limited access to basic telecommunications and the Internet. However, these constraints are not limited to the application of e-commerce to freight transportation services alone. Other parts of this report have shown how these constraints affect the general development of e-commerce in developing countries. Also suggestions have been made on strategies that may be adopted by the developing countries to increase their participation in e-commerce. These include actions related to improvements in access, infrastructure, awareness and the establishment of appropriate legal and regulatory capacity. These strategies, which would also apply to the development of e-commerce in freight transportation services, are not repeated in this section.[73]

Strategies for the provision of transport and logistics service

In Section III it was explained that the availability of appropriate transport and logistics services could be an important determinant of the growth of e-commerce in the coming years. While this observation was based largely on experiences gained in developed countries, it is obvious that the underlying factors would apply to developing countries as well.

The policy issue to be addressed is whether enterprises in developing countries should endeavour to develop in their countries transport and logistics services that are needed to handle e-commerce, or whether developing countries should depend on global services being provided by enterprises of developed countries. There is no reliable data on enterprises in developing countries which provide Internet based transport services on a significant scale. At the global level there is clear evidence that most service providers are based in developed countries. Figure 9 showed the regional distribution of companies, which provide freight transportation service using the Internet. Table 7 gave a list of main express delivery companies and their location by region.

There are a number of factors that may constrain developing countries from becoming major players in the provision of transport and logistics services for e-commerce, at least in the short run. The developing countries generate limited volumes of e-commerce and this means that there is insufficient national or regional e-commerce traffic to support the growth of transport and logistics service providers. As e-commerce traders have to sell to numerous

[73] Section 3 of the present report provides a description of the state of e-commerce in Africa and contains a comprehensive range of possible strategies to assist African countries to achieve greater participation in e-commerce.

customers on a global basis, their transport and logistics services have to be provided over global networks as well. This has led to the growth of large-scale service providers in the form of large integrated carriers or operations involving horizontal and vertical alliances among carriers, forwarders, delivery service providers and postal service. In view of the small volume of e-commerce in developing countries, enterprises in those countries are unlikely to provide global transport and logistics services in competition with services being provided by enterprises of developed countries. Another constraining factor is the costs of acquiring the necessary information technologies and transport facilities for handling e-commerce shipments. These tend to be quite high and beyond the reach of service providers in developing countries.

In the face of the above constraints, developing countries may involve themselves in e-commerce in freight transportation by adopting pragmatic and selective strategies, taking into account their particular infrastructure and technological capacities. In considering possible strategies, it is important to bear in mind that the application of e-commerce in freight transportation covers a wide range of activities, as illustrated in table 6. It can therefore be expected that while developing countries may not participate adequately in some activities, there is scope in others.

The main sectors in which developing countries are most likely to experience acute entry constraints are the business-to-consumer services, such as express and parcel delivery services where a large consumer market is essential to support large service networks. In such areas enterprises of developing countries could participate by complementing services offered by global service providers of the developed countries. This could be in the form of providing agency services or forming alliances or partnerships with them. Airlines, freight forwarders and other intermediaries who currently provide services for e-commerce tend to encounter stiff competition from integrated carriers who appear to be better equipped for handling e-commerce shipments. As a result some have considered the creation of alliances (between airlines, freight forwarders, etc). as a means of offering services that can compete effectively with services offered by integrated carriers. It is therefore conceivable, for example, for freight forwarders in developing countries to cooperate with global air transport carriers, as a strategy for participating in the transportation of goods in e-commerce.

The scope of involvement by developing countries, however, appears to lie in business-to-business transactions of services, especially in domestic markets. In table , the main examples that offer promise would include operations in maritime ports, airports, rail services, maritime shipping lines, container leasing and terminals. Significant gains in productivity can be achieved by having transactions in these activities performed using the Internet and other information technologies. As described in Chapter I the transactions could include invoicing, bills of lading, cargo information, customs clearance, etc. It is expected that major maritime companies, seaports, airports, terminals, etc., in developing countries are now endowed with some form of information technology. This provides great potential for them to focus on the development of systems that can promote greater productivity and lower transaction costs in these service areas.

Section IV — E-commerce and financial services

This section is devoted to the development of financial services and especially to credit risk management, banking, brokerage and insurance via the Internet. It first traces the inherent virtual character of financial services and their move from closed proprietary electronic networks to the Internet-based ones with possible impressive implications for finance and the economy as a whole. It then looks into the role of Internet in improving the

credit risk-management instruments and then goes into the issues of e-commerce in banking, brokerage and insurance. Finally, relevant observations and recommendations have been made for the financial service sectors of developing and transition economies and their participation in e-commerce.

Financial service providers: from proprietary intranets and extranets to Internet

Historically, storing wealth in paper money rather than in coins and bars showed the notion of virtuality of a modern token money. Keeping money with banks, that is, keeping it as notational money, also reflected a level of trust towards the national monetary authority and the banking system. The constant evolution of the technology of accumulating, managing and transferring money and finance moved first from paper to screen and within the electronic world from proprietary electronic networks to the Internet. In fact, a strict definition of e-commerce implies the use of Internet to fulfil a commercial transaction. In this chapter we discuss the use of e-commerce in financial transactions, including Internet-based payments, that is, the use of so called "electronic money".[74]

Banks and other financial service providers have, since the 1980s, been distinguished by the most extensive use of electronic communications. So-called electronic data interchange has been used by banks and stock exchanges for quite some time in their proprietary intranet and extranet networks, handling the payments and settlements, securities trade, provision of policies or other financial contracts. The biggest of them — SWIFT (Society for Worldwide Interbank Financial Telecommunications) — is an inter-bank transfer network handling operations of 3 trillion dollars daily. Many banks from developing and transition economies are members of SWIFT. However, even SWIFT, in its recent white book, declared plans to switch from an X.25 protocol-based proprietary SWIFT Transport Network to one based on Secure Internet Protocol Network.[75]

The advent of Internet — the latest and all-embracing open electronic megaplatform — was an important challenge for financial service industries, pushing them to compete online for their corporate and retail customers as well as to streamline and empower inter-bank and other intra-industry business links. The possibility of rendering all financial services electronically, with adequate security and at the lowest possible cost, determined their recent push towards the Internet. The much lower unit transaction costs of both online banking and brokerage and the fierce price competition were powerful driving forces behind the exponential growth of these new services. While the cost of a banking transaction related to a branch is estimated at US$ 1.27 and an ATM related one is US$0.27, on the Internet it costs merely US$ 0.01. Similarly the traditional full service broker in the USA is charging around US$150 per trade, the discount broker is asking for US$69, while the online broker's cost is only US$10.[76]

From the other side not only the nature but also the sheer volume of financial operations make them very pre-eminent in e-commerce. Thus it is reckoned that in 1999 nearly 60 per cent of e-commerce in the United Kingdom was concentrated in the financial services sector and that with the expected 10-fold increase of the British e-commerce by 2004, the share of the finance will even increase. Around one fifth of Finnish and Swedish bank customers are actually online, while in the USA online banking is growing at an annual rate of 60 per cent

[74] Our definition of "electronic" covers only instruments of payments and transfers through Internet (for further details see box 1).

[75] See http://swift.com/NGWhite/

[76] ITU, "Challenges to the Network: Internet for Development" , October 1999, p. 52.

and the number of online accounts might attain 15 million by 2003.[77] Such predictions suggest that the financial sector will be a leading player in e-commerce.

For financial services as well as the economy as a whole the Internet is something more than another efficiency gain. The cost of finding, on vast electronic financial markets, the best price for a given product at a given time is becoming virtually nil. The traditional methods of financial services are giving way to more modern and imaginative ones. Mixing banking, capital markets and insurance risk management products, bundling and tailoring them according to the needs of corporate and retail customers, might bring about drastic changes in the relative roles of various financial instruments and overall improvements in risk management. The more integrated corporate risk management markets might be able to package various risks, putting them into the form of derivatives or other instruments, and to sell directly or through auctioning to investors with various risk appetites. New techniques might even alter the role of traditional instruments such as shares or bonds. The opportunity to challenge the limitations of time and distance and to put together an unprecedented wealth of information and analysis could help to overcome the limitations of existing asymmetries in information and thus bring about a qualitatively new level of efficiency and stability to the financial markets and the world economy as a whole. At the same time many obstacles of technical, economic and political character could make it rather difficult to achieve such a high level of information maturity.

However, for the time being direct electronic dealing with customers is still a very recent trend, even in North America, which actually hosts around 60 per cent of all Internet users. The most active here are the household investors trading with discount brokers. Meanwhile, the customer base for online retail banking or even house mortgage banking is also rapidly expanding. At the same time, the conservatism of many customers and their habit of personalized service suggest that it is still early to predict the extinction of, for example, bank branch networks and a massive move by, say, North American customers towards fully online services.

It is also true that, in spite of an exponential growth of innovative newcomers practicing online banking or online brokerage, the electronic commerce scene is dominated by a few established commercial banks and brokerage houses holding the main chunk of that business, far ahead of the rest of the financial services industry. With forward-looking corporate leaders and more resources to invest in new proprietary systems or create new partnerships among leading financial service providers and technology firms, they are well placed to respond aggressively to the e-commerce challenge.

At the same time, the emergence of a host of new players in e-commerce — and increasingly blurred borders between banking, brokerage and insurance — pose serious challenges to the regulators of each respective sector. A much higher level of cooperation between them is demanded in handling various risks, including: sustained commercial presence of newcomers; conglomerates; and competing products evolved within each of the above-mentioned sectors or as a result of their interaction.[78]

In developing and transition economies many banks and other financial intermediaries are participating on various levels in the global intranets such as SWIFT while online

[77] "E-Commerce and Development", Background paper for UNCTAD 1999 regional meetings on e-commerce, p.25

[78] See Report No. 63 "Risk Concentrations Principles" (Joint report by the Basel Committee on Banking Supervision, the International Organization of Securities Commissions and the International Association of Insurance Supervisors), (E), December 1999; Report No. 62, "Intra-Group Transactions and Exposures Principles" (Joint report by the Basel Committee on Banking Supervision, the International Organization of Securities Commissions and the International Association of Insurance Supervisors), (E), December 1999.

banking, brokerage and other financial services are still a very marginal activity in the overwhelming majority of those countries. Only a dynamic minority group among these countries, dubbed as "emerging economies", with relatively advanced local banking and capital markets systems, are aggressively entering into the online stage of the financial services business. The developing countries, representing only 5 per cent of Internet hosts — with the whole of Africa accounting for only 0.4 per cent — have to pass a rather thorny way to resolve the issues of telecommunication infrastructure, Internet connectivity, content and use, as well as other aspects of electronic commerce.

In these countries the low density and high costs of telecommunications, the low level of computerization and the acute shortage of relevant skills, institutions and regulations impede the use of the Internet, in general, and within the financial services sector, in particular. At the same time, after the financial crises in Asia, Brazil and Russia, the wiping out of a large middle class using an established system of payments both in business and consumer financing, including housing, further complicates their move towards the Internet. However, the picture of online services in business-to-business relations is more mixed than it is in the case of retail clients. Moreover, there is evidence of a push by the corporate businesses of many developing countries towards the Internet. For example, according to "The Global Competitiveness Report 1999" more than 40 per cent of companies from China, Columbia, Jordan, Mexico and South Africa are using the Internet for e-commerce purposes while such countries as France, Japan and Switzerland are lagging behind them.[79] It is also expected that the growth rates of e-commerce would be higher for the developing regions. In other words, general observations hide a very uneven diffusion of e-commerce throughout the world where some developed countries could lag even behind a distinct group of developing countries. The unevenness of e-commerce penetration is also traced within countries and sectors of activity.

One should also note that while the Internet is not yet used by the financial service providers of the majority of developing and transition economies as a medium for transaction and transaction-related advice, it is still important for many of them as a medium for commercial information, risk analysis and pre-transaction communication. This in its turn could become an important factor facilitating their move to the e-commerce stage of Internet use.

Internet-based country and commercial risk analysis and databases: new opportunities to improve credit and performance risk management

The rapid expansion of the Internet made it possible to develop software technologies to back up an ever-increasing volume of databases and to constantly update them. The modern mathematical techniques of data mining permit one to draw on and analyse from various perspectives a huge flow of information. At the same time the Internet permits the accumulation at a reasonably low cost of a vast body of information on the whereabouts, activities, preferences and financial situation and payment records of potential customers. The various database software programs now permit management of a huge flow of analyses and information on the economic situation of countries (sovereign risk), the performance and solvency indicators of companies (commercial risk) as well as the payment records of individual users of credit cards. Hence it accords better possibilities of rational allocation of resources and improved risk management.

[79] *World Link* Magazine, July/August 1999.

E-commerce providers, especially in developed countries, extensively analyse customers' behaviour and performance, permitting better marketing strategies on the Internet. The information left by individual and corporate Internet surfers constantly feeds various interlinked databases on commercial risk. These databases are normally more sophisticated extensions of traditional credit-information databases, accumulating information from various mainly specialized firms on the financial situation of corporates and individuals, thus helping to mitigate the risks of the financial intermediaries. In its most developed form, credit information is playing a role as a substitute for credit insurance. This is the case in the USA, where the biggest credit-information company has extensive files on tens of millions of companies, permitting them to trade on open account.[80] In Western Europe and Japan credit information is a necessary precondition for the extension of trade credit or credit insurance cover.

Moving those databases to the Internet as part of Internet software products, drastically improves their efficiency and decreases the unit cost of a credit information file on a given entity. In parallel, international organizations, research centres and rating agencies have also moved their analyses and information related to the so-called country or political risks to the Internet, allowing countries to be rated according to their economic situation, macro-economic stability and economic policy. All that gives a possibility of merging and mixing various types of database, and in a very short time taking a credit decision, which is a revolutionary change in financial risk management.

As noted, the information on country risks or so-called political risks (i.e. threat to contracts coming from the policy environment or macro-economic imbalances of a given country), are available through various analytical centres, including rating agencies and international organizations. However, protecting international suppliers from non-payment risks and buyers from non-performance risks is a much bigger task and constitutes the main informational asymmetry impeding the flow of trade and investment to these countries.

Information on a company from the national register, from its audited account statements and finally from its payment records (credit information in a narrow sense) provides the basis for assessing the commercial risk. The quality and ease of access to public records on companies, and the enforcement of bankruptcy laws and court judgements are indicators of transparency and reliability in the regulatory framework of a country. In spite of the introduction of market-friendly laws, the weaknesses in enforcement mechanisms and business tradition in many developing and transition economies do not yet encourage formal information on companies to be taken at face value. Hence the difficulties in organizing efficient trade finance, credit insurance and other modern financing services. This stresses the necessity of systematic efforts to build up and improve the quality of local credit information services run by debt collectors, financial service providers or specialized companies. The advent of Internet facilitates this task and permits the start of Internet-compatible databases in those countries.

Moreover, given the globalization and liberalization of the markets, the leading Western financial service providers are actively looking for suppliers of credit information from the emerging markets. The aim is to create Internet or intranet databases on commercial risks of selected companies in developing countries and transition economies, with a view to rating their debts or determining the limits of cover for them and their individual transactions. Naturally, the way to build up these databases is either local presence or partnerships with local providers of credit information (if the latter exist). In other words, nowadays the demand for local credit information, trade finance and credit insurance services in those countries comes from both internal and external sources.

[80] See http://www.dnb.com.

A leading world credit insurer has suggested that by merging credit management techniques with opportunities provided by e-commerce one would be able to give a debt rating to millions of companies in both developing and developed countries; currently leading rating companies rate only several hundred corporate and foreign bonds. Such a vast bonding or commercial debt-rating operation might give a greater access to trade finance to millions of companies participating in international trade. As credit insurers are virtually rating the buyer's debt by insuring and reinsuring it, there is a possibility to develop a standard product where the rating company is not only rating but also wholly or partially guaranteeing that debt.[81]

Thus the Internet is helping to take a big step forward in credit risk management and make it a much less costly operation. It is also opening perspectives in organizing credit information, trade finance and credit insurance systems in developing and transition economies, hence facilitating linkages between local entities and foreign buyers and suppliers. To combine the advantages of trade, finance and modern communication technologies, the majority of developing countries and countries in transition should follow others already engaged in creating and developing local credit information systems and local modern trade finance and credit insurance facilities. By making information on local credit risks available through Internet and global intranet-based databases, those countries could eventually join the global information flow on commercial and political risks. They will get better scoring and rating opportunities and hence more access to bank lending, investment, trade finance, credit insurance and reinsurance capacities so necessary for trade and development. A systematic treatment of interdependent issues of trade, finance and development is necessary to link trade efficiency, financial risk management and electronic commerce.

Online payments and credit systems: new challenges for banking

Traditionally, the organization of national and international payments systems is handled by commercial banks. With the advent of the Internet, the traditional role of banks in the payment system is coming under threat from non-financial mainly software companies trying to propose their own payments solutions to the customers and hence to "disintermediate" the banks. The main competition is now around the question of who will dominate in proposing various products, including electronic bill presentment (EBP), online procurement (OP), payments through smart cards and so on. Given the fact that the leading banks intermediate massive payment flows, generate huge volumes of bills themselves and are constantly upgrading their sophisticated treasury management products they should be in a position to address this challenge by introducing their own electronic bill presentment and online procurement products in cooperation with leading technology companies. Most probably the payments systems emerging from competition or cooperation of the leading banks will dominate the international payments scene and will oblige smaller banks and other service providers to adopt those payment schemes.

Online direct billing of the customers and smart card-based payments services are becoming one of the key e-commerce activities for the banks (see box 8). Thus, to face the disintermediation challenge, the leading Anglo Saxon banks such as Bank One, Bank of

[81] For further details see http://www.coface.com.

America and HSBC are actively introducing the EBP and OP using IBM technology.[82] Other leading banks are apparently following suit.

Box 8. Electronic money and smart cards: a medium for the future?

There is a great dispersion in definitions of electronic money. According to the April 1997 "Electronic Money" Report of the G10, electronic money is the means whereby retail payments are executed over the Internet, which leaves other traditional electronic payments outside of its scope. At the same time OECD tends to include other electronic communication systems such as Minitel into the concept of e-commerce. Our definition of money is similar to that of G10.

It should be stressed here that e-money doesn't change the definition of money or its aggregates as such. The systemic impact of e-money on monetary creation could manifest itself through amplifying the transmission of a credit multiplier and the increased velocity of money circulation. It could also play a considerable role in further changing the composition of money by reducing the share of traditional token cash.

Potential customers are equally confused by a variety of terms related to e-money. Alongside with the common term "smart card", terms include: e-cards, trade cards, and debit and stored value cards, as well as e-cash, digicash, digiwallet, e-credit, e-loans etc.

In fact, e-money is presented in a more integrated form than the traditional payment instruments. It is in fact a kind of smart card, that is, a multipurpose card, embodying the virtues of credit, debit and cash (stored value) cards. Instead of magnetic strips this card contains a microprocessor chip which through a special software attached or preinstalled in the PC hard disc could permit the card holder to not only have the above functions but to also add personal data, and the capability to communicate and accumulate various benefits for travel or other purchases, and so on. In other words, such terms as digicash, digicoins or digiwallets merely represent the possibility to accumulate a required amount of highly divisible cash or stored value in the chip. It is normally not a very big sum and is derived from the personal account of the holder. Correspondingly the debit card function permits the debit of bigger sums directly from the holders account, while the credit card function permits the holder (it is directly linked to the holder's bank account) to have a short term consumer credit from a credit card company, with some overdraft possibilities.

The main challenge here is the design of the most secure open payments platforms on the Internet for multiapplication or smart cards. Among the main contenders are so-called Java Card, Multos and Smart Card for Windows. Other groups are also heavily investing to construct state-of-the-art software technologies insuring secure password protection, digital signature authentication and encryption, as well as adequate driving, switching and authorizing technologies. However recent major breaches inflicted by the hackers on the security of credit cards payments on the Internet stresses the need for big and systematic efforts to resolve the security problem for the card owners.

The bigger transfers include loans, mortgages and trade credits. They also could use smart cards or so-called trade cards or be based on contractual relations using electronic bills containing encrypted electronic signatures. Currently, the most popular platform is the Secure Electronic Transaction (SET) protocol, which both American and European banks are recommending to their corporate clients.

As shown in box 8, the security of banking payment systems is of primordial importance. This observation is true for both Internet and traditional banking. A security protocol should provide reliable data encryption, server authentication and message integrity for an Internet

[82] "Commercial Banks & Securities Broker Dealers", in "e-Commerce: Virtually Here", Merill Lynch 150pp., April 1999; see http://www.ml.com, "Banking Technology", May 1999, pp. 5, 53

connection. Passing through cleansing firewalls, only authenticated requests should reach the Internet banking server. Meanwhile, a security analyser should constantly monitor login attempts and recognize failures that could indicate a possible unauthorized attempt to log into an account. Currently banks and their business partners are trying to develop an array of secure electronic payments and finance models for their retail and corporate clients. The models differ due to the character of clients or operations. Achieving that level of state-of-the-art communications demands mobilization of a great deal of know-how and investment.[83]

A group of industry watchers assumes that the United States banks are planning to spend US$ 1.48 billion through 2003 to build up e-commerce payments systems. Other non-bank entities are expected to spend only US$ 300 million. More than 91 per cent of that money is expected to go to the creation of a new generation of driving, switching and authorizing technologies.[84] The other most active OECD area where the banks are also embracing e-commerce opportunities is Europe. The big banking houses here have either started or announced plans to develop an integrated approach to e-services, involving all their branches and subsidiaries. They are also actively forging alliances between themselves and with technology groups to further develop secure e-commerce payment systems. While they want to be leaders in pan-European asset-gathering strategies, they also display big ambitions on a global scale.[85]

The future of online banking lies in developing relations with both retail and corporate clients. The main challenge here is to propose the best model for providing payments and financing options. Online banking apart, smart cards (see box 8) could also propose digital-checking systems, accepting online instructions from a customer to pay a bill. However, for the moment, few creditors, including the majority of corporate clients, are set up for online payments. So the banks must still send a paper check through the mail.

As noted in box 8 the cards made possible the development of online banking in short-term consumer credit. What was also amazing was the dramatic increase in online longer-term consumer credits as well as mortgages, which grew very fast especially in North America.

Servicing corporate clients online is the biggest Internet-related ambition of the banks.

The flow of payments and transfers among commercial entities and related risk-management techniques might differ depending on the character of relations between those entities. Within or among corporate structures with various levels of integration, that is, branches, subsidiaries and subcontractors, the documentary requirements for an electronic transfer is relatively straightforward. At the same time, the increased loosening of corporate structures and expansion of outsourcing to an array of subcontractors will increase the number of participants in the corporate payments traffic and hence the responsibilities of payments traffic managers, especially as far as the subcontractors' risks are concerned. At the same time, payments and a financing process based on standard contractual relations among various corporate entities will continue to have stricter documentary requirements including the demand for collateral. Proposing new and secure online solutions for the above

[83] See: http://www.banking.com/security.asp.

[84] See: http://www.epaynews.com/statistics/transactions.html#6.

[85] See:http://www.ubs.com, www.db.com, www.hsbc.com, www.commerzbank.com and others.

[86] See: http://www.banking.com/security.asp.

[87] See: http://www.epaynews.com/statistics/transactions.html#6.

[88] See: http://www.ubs.com, www.db.com, www.hsbc.com, www.commerzbank.com and others.

payments traffic will be one of the most important challenges to banks in the beginning of the 21st century.

In that respect it is also important to refer here to the issue of standardized documentary requirements in international trade, including the payment documents. The standardization of the international trade process, including sales contract, financing, transportation and insurance of goods and services has evolved throughout the 20th century with the rather active participation of the UN. During the last decade of the century, a lot of work was done to put in place electronic versions. However, the real dissemination of an Internet-based system has yet to come. Some international groups including the Bolero venture or Trade Card venture have for quite some time been trying to build up an integrated Internet platform for foreign trade operations, where the trade finance process plays a central role.[89] Those global business ventures are seizing the opportunity of online international trade finance and are trying to remove paper from all phases of the international trade process by replacing it with business-to-business e-commerce data exchanges and thus improving its efficiency, lowering trade transaction costs and reducing fraud. The groups behind these ventures claim that they are in a position to provide an open, neutral, adaptable platform to be incorporated into the workflow processes of their users and hence to meet the security needs of the latter. Introduction of mutually acceptable legal rules concerning the content and format of documents, which would create a legal certainty and facilitate *inter alia* a quick and secure transfer of ownership of goods, are among the main conditions determining the popularity of a given platform. At the same time, possibilities for financial institutions to guarantee or rate corporate trade debts has yet to be fully introduced into those platforms to make the global payments traffic through them more secure and predictable.

The development of online banking e-commerce techniques and the inflow of new players frequently lacking established branch networks and sometimes adequate banking know-how poses a serious challenge to the national banking supervisors and raises the issue of their close cooperation. For the moment, the vast majority of countries supervise their banking industries on the basis or requirements embodied in the accords of the so-called Basel Committee on Banking Supervision, a body including central bankers from OECD and some emerging market economies.[90] Tough online competition and better terms proposed to customers are posing increased risk on the commercial viability of those online banks and hence raises the issue of sustained commercial presence. Stringent control over adherence to capital accord rules and their modifications for all players is essential to ensure protection of depositors and clients in the emerging era of e- banking.

The dynamics and imperatives of e-commerce are also pushing banks from Africa, Asia, Eastern and Central Europe and Latin America to participate in that process. Although the picture is fragmented here, the strength of the current e-velopment trend is very present in the banking sector of many countries in those continents and regions.

At the same time, the participation of developing countries in banking e-commerce is complicated by the fact that the majority of developing countries are considered as high political and commercial risks. So are the credit ratings of the majority of their local banks. The reasons for that include the low level of bank capitalization, the high share of problem credits in bank portfolios, high interest rates, insufficient level of computerization, much greater relative costs of access to the Internet and telecommunications, heavy reliance on branches and other factors. However, support to facilitate the active use of e-commerce

[89] See: www.bolero.net; www.tradecard.com.

[90] See BIS "Core Principles for Effective Banking Supervision", Basle Committee on Banking Supervision, Basle, September 1997; "Core Principles Methodology", Basle Committee on Banking Supervision, Basle, October 1999 etc.

products by local banks could improve many parameters of their performance and hence increase their credit rating.

Securities firms: from traditional to online brokerage

The Internet challenge to traditional securities firms came first from the online discount brokers, proposing that proactive retail investors buy and sell shares at a very low transaction cost. Naturally, the negative side of that trend was the losses incurred by non-professional investors, which deterred others from choosing this path. However, the answer to that challenge was swift, and the leading brokerage houses soon started to provide online services, which initially included information and some online trading.

Now we are already witnessing a second phase of e-commerce revolution in brokerage. It combines active online trading, with tailored and detailed financial information, analysis and advice for a proactive client. Various products have been proposed especially in North America by both traditional and new brokerage houses including Bear Sterns, Charles Schwab, E-Trade, Goldman Sacs, J.P. Morgan, Merrill Lynch and others.[91]

Normally a sophisticated brokerage system is a platform, which combines online trading, financial information and analysis and advises a client. Using that platform, the client could trade and invest himself online, get information on investment-related and tax-management materials, consult his real-time account positions and acquire banking services. Sometimes within the same platform the client can even go for online shopping with an authorized credit card. As a result, the more client uses services of a given platform the less is his unit transaction cost. For clients with sizeable and growing financial portfolios, there is a link between direct trading and multiple-account management based on the guidance proposed by the managing company's financial consultants. As a rule, an asset-based fee of a full service broker replaces traditional per-trade and other à la carte charges. For that the client expects to have virtually unlimited transactions in most securities, the personalized guidance and advice from a company financial consultant, individualized financial plans with periodic updates, smart cards and other e-commerce links and services.

For example, in one of the direct online systems a client might view his entire portfolio on one screen or select specific investment, retirement or other consolidated tables, monthly statements and annual tax statements. He could also track realized and unrealized gains and losses, monitor daily activity and compare his concrete asset allocations with model portfolios prepared by service-providing company professionals and designed to achieve a variety of investing goals. The same system gives possibilities of: investing in equities through IPOs, secondary market and mutual funds; and buying CDs as well as various corporate and Government bonds. If some idle cash remains, it could be placed in an interest-bearing bank deposit allowing purchases against the account through a debit card or checks.

For clients who can view the reports through online and direct services, the exclusive corporate Internet multimedia platforms of big service providers normally combine video research information and analysis with the Internet. They include daily updated investment research and reports from industry analysts, economists, mutual fund managers and financial planning experts who cover markets around the world. Customer services on those platforms are normally open 24 hours a day to answer client questions via email or telephone.

[91] See: http://www.ml.com; www.jpmorgan.com; www.goldmansachs.com;; www.bearstearns.com; www.charlesschwab.com; www.etrade.com.

In spite of the above-mentioned client support, the latter should have an opportunity to make informed investment decisions through a wide variety of alternative independent information sources, including industry research papers, various stock indices reports, real-time news stories and headlines, stock, bonds and earnings guides and dividend records, as well as daily news.

So while the first phase of e-commerce in brokerage was a simple trading, the second combined trading with comprehensive assessment of the customers' needs. The latter frequently implied a switch from management of one or several client portfolios to management of all his financial assets online. In that respect, it is interesting to note that in a number of emerging, developing and transition economies with relatively advanced capital markets, the brokerages entering into the online operations are espousing the latter strategy of servicing their local clients' needs.

Finally the sophisticated online brokerage services raise the issue of adequate regulation of shares trading and especially the trading undertaken by exclusively online discount brokers. Efficient enforcement of strict licensing and supervision practices is the first precondition to avoid weak operators or fraudulent practices in the securities markets. The market intermediaries should, therefore, be subject to adequate and ongoing internal control, as well as capital and other prudential requirements. High quality accounting and auditing, as well as the highest level of transparency in both pre-transaction and post transaction phases, help customers to understand better the complex character of securities transactions and protect themselves from fraudulent schemes. If necessary, the intermediaries should also be in a position to wind down their businesses without causing loss to their customers or counterparts or incurring systemic damage.: In economies with emerging capital markets, the regulators still have to learn and apply the best regulatory practices to manage their local securities markets, and there still is a need to protect local customers from fraudulent foreign-based online operators. This is a challenge that has to be addressed through better coordination efforts by industry associations.

E-commerce in insurance

In 1997 only a small fraction of the US$ 2129 billion insurance premiums collected worldwide was due to transactions executed over the Internet. The significant volume of business between major operators in the insurance industry has been transacted over established proprietary (i.e. closed) electronic networks. [92] However, as in other financial services Internet based e-commerce is also gaining momentum in insurance, especially in North America and Western Europe.

An insurance transaction requires a high volume of two-way information transfer between insurers and/or brokers in business-to-business trade. Similar high volumes of data are exchanged between insurers and brokers/agents, as well as corporate or individual clients in direct insurance purchases. Therefore, the insurance sector is a natural contender for adopting e-commerce practices.

The e-commerce revolution in insurance stresses the need to rethink the whole structure of relationships in the industry. Advantage should be taken of the possibility of offering tailor-made products at lower administrative costs through: automating quote generation, contracting and processing of claims; migration from expensive proprietary client-server systems to low-cost Internet based systems for EDI; and the development of Internet-enabled software for conducting insurance operations, both within and between corporate

[92] http://www.swissre.ch/e/publications/publications/sigma1/sigma9903.html, "World insurance in 1997: Booming life business, but stagnating non-life business", Sigma 3/1999, SwissRe Publications, & http://www.ft.com/ftsurveys/q501e.htm, "Case study: World Insurance Network", 7 April 1999.

structures of insurers, reinsurers, brokers and agents. The aim is to achieve a state where insurance business is accessible round the clock worldwide.

To achieve that state many issues have to be addressed.[93] The industry needs to establish a common standard for authentication and data encryption on the Internet, switch investments emphasis from marketing, customers and intermediaries support, towards developing Internet-related communication and sales capacities. Already extensive users of information technology (IT), insurers, agents, brokers, risk managers and their clients should be in a position to benefit from the incoming e-commerce revolution. However, to get there the insurers must also overcome the problems of product complexity and the diverse regulatory environments for the sector as well as developing arrangements with agents and brokers in the era of e-commerce.

In insurance the distinction between business-to-business and business-to-consumer relations is not so clear. In particular, corporations that buy insurance often have important risk management departments that do self-insurance and related financial management for the corporate account and for the company staff. E-commerce will further blur the borders between the two.

Within business-to-business relations it is important to distinguish the industry's existing electronic networks. In Europe, three existing networks, Limnet, Rinet and WIN are merging and will soon start operation under the name WISe (World-wide Insurance Electronic Commerce). Limnet is a consortium of the Institute of London Underwriters, the London International Insurance and Reinsurance Market Association, Lloyd's and Lloyd's Insurance Brokers Committee. Rinet is a Brussels-based association of insurers and reinsurers. Limnet and Rinet were established in the late eighties. WIN was established by six prominent insurance brokers in 1996. Prior to merging, Limnet estimated that "among its members, 15 per cent of risks are being handled electronically as opposed to 90 per cent company market claims".[94] Rinet assessed that 60 per cent of world and 80 per cent of European net written premium income was transacted through its network. The same is true for 50 per cent of United States gross reinsurance premium income.[95]

Prominent institutions from the United States market include Insurance Value Added Network Services (IVANS), the Brokers & Reinsurance Markets Association (BRMA) and the Reinsurance Association of America (RAA). IVANS was established in 1983 as an insurance industry network which handles the majority of United States non-life insurance transactions and an important percentage of life/health insurance transactions.[96] While RAA and BRMA are not managing electronic-transaction networks themselves, they have a keen interest in developing and promoting EDI in the industry.

Not many insurers and reinsurers from developing countries are members of large international networks. Until recently this could have been explained by comparatively small business volumes that could not justify the cost of hooking up to the existing proprietary networks. With the introduction of Internet-based networking, the cost barriers become less significant. Hence, one should expect several of the larger insurers in developing countries insurers to make decisive steps towards using business networks to improve their competitiveness and promote transparency in their operations. The globalization and liberalization of national insurance markets will push them in that direction.

[93] Conclusions of study by consultants Booz-Allen & Hamilton as reported by IVANS, http://www.ivans.com/techcent/eline/article.cfm?id=110

[94] Micheal Burton, CEO Limnet, http://rmisweb.com/rmisartc/nu/090296.htm.

[95] http://www.rinet.com/RINET/rinet.nsf/pages/presentGEN.

[96] http://www.ivans.com/about/corp.cfm.

WISE, BRMA, IVANS and RAA have set up an institution called Joint Venture. The objective of Joint Venture is to "formulate and maintain standards for the transaction of (insurance) business electronically within the international insurance and reinsurance industry".[97] The Joint Venture secretariat is administered by WISE and e-commerce issues addressed here go beyond EDI standards for electronic business transactions to include repository interoperability, email standards and document exchange standards.[98]

Insurance agents and brokers will greatly benefit from common standards for EDI, be they applied to proprietary systems or Internet-based data exchange. Many of them have taken the initiative and are networking among themselves and with insurers and are in some cases leading the way in insurance e-commerce. They realized that without active use of e-commerce they might very soon get marginalized as actors in the insurance business.

At the same time, business-to-consumer transactions are an equally important driving force behind the insurance e-commerce revolution. The outcome will hopefully be a situation where the "… Internet allows suppliers to put out different products and see which one takes. Clients want to design their own (insurance) products around their own risk profiles (and) insurers have to respond to this".[99] Preconditions for success include high Internet penetration and a potentially large market, as sales are likely to be small in the first instance but will have to justify the necessary additional expenditure on IT infrastructure to investors.

As practice shows, once an Internet sales facility is established the transfer of costs to the consumer is a fairly quick process. The latter enters data to generate a quote and finances the connection cost, which are steadily decreasing with the liberalization of the telecom markets and increasing competition between Internet service providers (ISPs).[100] In the life insurance sector, estimates of cost savings on servicing customers are 30 per cent, on average, while possible decreases in product development time might reach 75 per cent.[101]

IVANS recently conducted studies to establish the growth of Internet use by insurers in the USA. 110 non-life company websites were reviewed and the results, which show an exponential growth, are presented in Table 8 below:[102]

Table 8. Growth of Internet use by insurers

	August 1999	February 1999
Electronic feedback forms for customers	62%	25%
Interactive email	55%	29%
Agent locators	70%	65%
Online claims submission	10%	6%
Online policy updates	17%	6%
Purchase an insurance policy online	4%	1%

[97] http://www.jvstandards.org/about/about.htm.

[98] http://www.jvstandards.org/organization/organization.htm.

[99] Ellen Lim, Chief Information Officer of XL, Hamilton at London Processing Centre's annual meeting 1999, World Insurance Report 606, 19 February 1999, page 5.

[100] See: http://www.ft.com/ftsurveys/q5022.htm.

[101] Paul Bingham, MD of EDS, reported in http://www.ft.com/ftsurveys/q5022.htm.

[102] See: http://www.ivans.com/about/press/083199.cfm.

Doubts have been expressed on the necessity for insurance intermediaries, in particular in direct sales of personal policies (life, motor vehicle and so on). In other words, the insurer still has to determine whether to choose an online network as opposed to an agent network or a strategy, which combines both.

If the insurer chooses to keep its agent network, its human resources development investments must reach these agents and qualify them to use the most recent Internet and IT developments to promote competitiveness and better service quality. Regardless of the decision taken, training and investment in human resource development is fundamental to transforming an insurer business or an agent/brokerage operation into an e-business.

Finally, it is very important to assess the implications of e-commerce on the supervision and regulation of insurance.[103] Those implications for a country's insurance supervisor and its office are threefold. First and foremost, it must address concerns about the insurance retail services on the Internet. Secondly, the supervisory authorities might decide to adopt the Internet as a medium for conducting their own supervisory business. Finally, recognizing the borderless nature of the Internet means that the supervisory authorities might wish to initiate changes in current insurance laws and regulatory systems to reflect the new realities for all parties to an insurance contract.

In contrast to retail insurance, the purchase of insurance by big corporate clients needs more sophisticated software programs to make e-commerce meet the requirements for policies which are negotiated and tailored to specific risk profiles and lack similarity in substance and structure. Today, it is still difficult to envisage a petrochemical industry or an airline obtaining an insurance quote by filling in a form on the web. However, once a policy is in place, its maintenance may be made more efficient through the use of web or email-based communications. Corporations typically employ risk managers who, among other duties, negotiate the corporate's contracts with its insurers. Being experts, they are less in need of insurance supervisor's offices than are individuals.

Many of the concerns about the general protection of consumers buying on the Internet apply to insurance. It may be an important task for the supervisor to inform the insurance consumer about electronic contracting and assist him in foreseeing problems and advising on practical solutions. The discussion below does not exhaust the subject matter but merely attempts to describe several concerns.

A fundamental issue is the continuity of the commercial presence of the insurer. Unlike other products or services, an insurance contract subjects the insurer to an obligation of performance for a certain determined and prolonged period after the contract document has been signed and the premium remitted. Therefore the permanent and continuous commercial presence of the insurer is fundamental to the delivery of eventual claims/ reimbursements. If the insurer decides to withdraw from e-commerce or change its Internet address, regulatory requirements need to be in place keeping the consumer informed of the insurer's virtual or physical relocation. This in turn takes us to the issue of licensing and supervisory purview, which, like taxation, has relied on geographic domicile in determining the rights and obligations of all parties to an insurance contract.

Another problem is that consumers, due to the different hardware and software configurations, may not see all the information presented on the insurer's web page. Further,

[103] The discussion in this chapter owes a great deal to information and analysis provided by the NAIC – National Association of Insurance Commissioners (www.naic.org) and the IAIS – International Association of Insurance Supervisors (www.iaisweb.org).

a user's lack of computer proficiency may lead to an unintended contractual result. Certain regulatory guidelines on basic content may be considered, in particular information on who is the supervising body and who are the final risk carriers in the case where purchase is being made from an agent's or broker's web page.

Consumer privacy and conformity to privacy laws are paramount, as requesting an insurance quote requires the provision of personal, financial and even intimate data, as is the case with life and health insurance.

Electronic signatures are important not only in confirming the existence of contract but also in specifying the start of the purchased insurance cover. Contract validity and effectiveness may be influenced by failures in data transmission: the consumer may be under the impression that a contract is in place while the insurer may have received damaged data that does not allow cover to be put in place. The problem is not obvious until the insured attempts to claim under the non-existent contract. While not receiving on time, or at all, a parcel of books, garments or consumables is discomforting, being uninsured due to signature or data transfer problems and experiencing a total loss say due to a house fire may be extremely disruptive.

After a policy takes effect a need or possibility might arise to cancel, change or complement it caused by discovery of error, further consideration by the client or a fundamental change in the insured's risk profile. Two issues have to be addressed in this case. First, the client should have a "return or exchange of goods policy" possibility, within a specified time limit, for insurance purchased on the Internet. Second, a kind of security needs to be in place to prevent accidental or unauthorized cancellation.

Other issues of concern to supervisors are advertising and the use of a client's profile data on file with the insurer because of previous contracts, choice of transaction sites, fraud and methods of payment.

Individuals and industry should have access to the Supervisor's offices through the Internet and supervisors are steadily adopting Internet as a standard communications tool with policyholders, beneficiaries and industry. A number of supervisory authorities have already established a web presence with varying degrees of interactivity. A general overview of those sites could be obtained by visiting the members' page of the IAIS.[104]

Insurance supervisors may also use the Internet to offer advisory services to consumers through a "frequently asked questions" web page. It may use its web page to receive individual messages and complaints and refer consumers by email as to possible options for action in the event of misunderstandings or conflicts of interest. Information on the operating license, rating and quality of service and financial data on insurers and intermediaries, as well as current legislation, may be provided to the consumers.

Supervisors may wish to take full advantage of Internet communications in their work with the insurers. Some possibilities include:

- Providing information (compliance, licensing, fees),
- Receiving reporting information on electronic forms,
- Direct monitoring of Internet sales and business solicitation,
- Communication with supervisors in other jurisdictions and sharing of information on licensed or problem insurers or intermediaries,
- Providing reliable information to insurers about agents or brokers they wish to engage in production and delivery of insurance contracts.

[104] www.iaisweb.org/1/about/014.html.

Insurance regulations worldwide will certainly have to be adjusted to account for borderless insurance e-commerce. There are many benefits to be had for consumers, insurers and supervisors and therefore the initiative for change should be consensual and tripartite.

Regulatory authorities in developing countries must judge and anticipate with great foresight the implications of insurance e-commerce. Consumers in these countries could be targeted by fraudulent operators, and the availability and cost of legal assistance could render them without practical options after being defrauded. It is the role of the supervisor to inform the consumer on the perils of purchasing cover over the Internet, in particular through the supervisory authority's web page. The consumers most likely to buy insurance online are the kind who ask to check on the profile of an insurer with the regulatory authorities in their own country or in the country of incorporation of the insurer.

E-Commerce and financial services in developing and transition economies: some concluding remarks

The examination of e-commerce trends in banking, brokerage and insurance stress a possible impact of the Internet on a further blurring of borders between those financial services. The development of various so-called derivative instruments and their use in e-commerce might accelerate the integration and substitution effect of these new combined and multi-sectoral products. In fact, the convergence of various payments, debt and risk management instruments is well under way in the OECD area. Here we are witnessing the increase of various corporate debt security techniques at the expense of bank credit or an active use of forwards markets to insure exchange rate and price risks, or of options to manage various risks which were the domain of traditional insurance.

Those tendencies are not still very evident in the case of developing countries. However, the Internet is making possible a more dynamic development of these processes and their applicability in a much wider group of countries. The overview of e-commerce in banking, credit risk management and brokerage and the impact on developing countries permits some preliminary comments on the direction of development of e-commerce in financial services and the impact on the development process as a whole.

The above analysis first suggests that the trend of further rapid expansion of e-commerce in financial services will continue with stronger tendency for their proliferation in developing and transition economies. As the leading e-commerce-related sector, the financial services will play a central role in further globalization and liberalization of the world economy.

Better possibilities for credit risk management due to modern techniques, real-time communication capabilities and their low transaction costs might open unprecedented opportunities, particularly for developing and transition countries in their access to world financial markets. Making Internet affordable to local financial service providers and the public at large might play a powerful role in adapting these countries to the requirements of the modern economic organization and thus through "e-velopment" further the cause of development.

Chapter 3 . The state of E-commerce

As the previous chapter showed, e-commerce has a "development specificity" which affects both its sectoral and inter-sectoral aspects. But can one also speak of the "geograhical specificity" of e-commerce? In other words, does the international picture of e-commerce participation suggest that geographical policies and approaches should be adopted, and if so what should they focus on? Can one speak of a "digital divide" which would affect developing countries' ability to take part in e-commerce? Which regions or groups of countries are actually faring better than others in this respect? What appears to be their recipe for success? What could prevent other groups or individual countries from replicating such successes? Could it be that e-commerce is a game for relatively advanced countries only, namely for those with capital and technology endowments? If so, could the "digital divide" cut across the South?

These are some of the questions that this chapter attempts to address, first from a global point of view, and in a second step by looking more closely at the situation of the poorest continent, namely Africa.

Section I — Inequality and inequity in e-commerce: where will the digital divide run?

For countries, enterprises and individuals alike, the possibility to use and participate in e-commerce requires that three major pre-conditions be satisfied; these conditions hold in three keywords:

- Access
- Know-how
- Trust

Access includes both physical access (to telecommunications infrastructure and networks such as Internet) and economic access (whereby the price structure through which potential users can access Internet — and hence e-commerce — is not prohibitive). Know-how requires that the proper knowledge and experience be shared among all potential users. Trust includes all issues related to the security and confidentiality of transactions; it includes authentication and encryption issues, as well as other themes related, for instance, to intellectual property, contracts in an electronic environment, legal and regulatory frameworks and consumer protection. Since know-how and trust issues are being addressed in chapters 2 and 4 of the present publication, this section focuses on current inequalities and possible

inequities in the way in which various countries (and hence their respective enterprises and citizens) have or do not have access to proper telecommunication services, and to the Internet. If such inequalities and inequities are not addressed as a matter of urgency, the rapid expansion of electronic commerce could indeed contribute to broaden rather than reduce a possible *digital divide*, which would separate the *haves* from the *have-nots* in the sphere of information.

Altogether, it is fair to say that over the last few decades the average world level of telephony[105] has significantly improved. Currently, as optical fibre spreads around the planet, and as communications satellites – both geostationary and non-geostationary – multiply, the capacity of telecommunications both within and between regions and countries is undergoing a phase of explosive growth. For example, according to the US Federal Communications Commission the world undersea cable network, representing one of the principal elements of telecommunications capacity, might grow exponentially and in 2001 attain a level which is 12.5 times what it was in 1998. Such a growth is, first, due to new technologies that permit communication of a much bigger volume of information through the same installed communications capacity. It also reflects the simultaneous completion of many telecommunications infrastructure construction ventures. Given the level of competition in the industry, this dramatic growth is bringing about cuts in service prices charged to customers. The latter normally lease the so-called bandwidth, which is the adopted measure for a unit of communication capacity. While a monthly rate for 2 megabits per second data communicated from London to Paris quoted by BT and France Telecom was on the level of USD 40 000 in 1998 it came down to USD 20 000 in 1999. At the same time, Reuters using the opportunities of the newly created bandwidth exchange market could have leased the same capacity for USD 3 000–4 000 monthly.[106] The exponential increase in communication capacity and drastic cuts in its unit costs are the striking features of the transition to the era of Internet, where data and image rather than voice might represent the main bulk of communications. It is yet unclear whether such capacity growth will create a problem of under-utilization. The use of new software applications with increased memory and hence the capacity to transfer greater volumes of information will demand higher levels of bandwidth from the communication service providers. Thus many observers foresee increased demand rather than surplus supply capacities.

The higher growth rate of telecommunications infrastructure in developing countries is an encouraging sign that the gap is closing in the use of telecommunications, Internet and hence e-commerce between them and the OECD countries. However, this gap is still huge and the signs of diminishing inequality come only from a selected, albeit disparate group of developing countries. From e-commerce development perspectives, a highly pressing problem is still the extremely uneven distribution of international telecommunications capacities and the unfavorable level and structure of telecommunication costs for users in developing countries.

The ITU multimedia access-ranking indicator assessed the weighted average of penetration of various telecommunications means in 206 countries in 1998. The indicator includes the number of telephone mainlines, TV sets and cellular mobile phones per 100 people as well as the Internet host density per 10 000 people.[107]

Thus the first 30 countries of the world (which along with nearly all the OECD member countries include countries such as Bermuda and Estonia) have on average more than 55 telephone mainlines per 100 inhabitants. The level of telephone penetration in the relatively advanced Latin America and Caribbean region is barely above 20 per cent of the average

[105] As measured for instance by the number of telephone main lines per inhabitant.

[106] "International Herald Tribune", 8 October 1999, p.11.

[107] "Challenges to the Network: Internet for Development", ITU, October 1999, pp. A25–A28.

OECD. Apart from selected Asian economies the countries in the rest of the developing world have much fewer fixed telephone lines. At the same time, many economies in transition have inherited from the command economy a relatively high level of telephone mainline density. However, the availability of 20 or more telephones per 100 inhabitants in many transition countries goes hand in hand with an outdated telecommunication infrastructure. One should also note here the example of China, which in the ITU ranking occupies only 102nd place – this indicator hides an extraordinary growth rate in all parts of the telecommunications sector in China (see box).

Box 9. E-commerce in China

China with its immense market potential is also one of the regions characterized by a rapid growth of e-commerce. The latter is considered by Government as a priority area for development. Its wired and wireless customer base gives China a telecommunications market that is second only to the USA. In the 1990s the country was, every 2–3 years, doubling the number of fixed and cellular phones as well as PC and Internet host penetration. It is expected that by the beginning of the millenium the fixed telephones will reach the level of 150 million lines, i.e. 15 lines per 100 people. However, China has a very uneven distribution of telephone lines: while rural telephone access is comparable to the low end of the developing world, the dynamic coastal areas are close to the OECD average indicators. While the number of Internet users in 1999 was around 4 million, some estimates suggest that in 2003 the number of users will be between 20 and 40 million.[108] The relatively high share of digitized lines makes China a market already well adopted for e-commerce.

According to findings of a project on e-commerce in China, the main barriers to business-to-business e-commerce included: insufficient and uneven access to high speed Internet networks, inadequate procedures for electronic payments, insufficient legal safeguards for secure transactions, necessity for a regulatory structure encouraging investment and competition, monopoly practices of existing operators, insufficient linkages with foreign capital and expertise to include China in the global marketplace via Internet. For e-commerce with consumers the shortcomings noted were: limited public access to PCs and networks; lack of alternative delivery systems or ISPs; inadequate awareness, training and cultural barriers; concerns over security, quality and prices; limited availability of delivery systems and credit cards. At the same time the limitations for the Chinese public telecom-related agencies include: inadequate resources and public policy expertise; conflict between operative and regulatory functions; inadequate procedures to address the issues of intellectual property, data integrity, privacy protection and liability redress; inability to strike a balance in public and private sector cooperation in adapting standards and regulations to market innovations, in cost allocations and subsidies and generally in the use and provision of e-commerce services. [109]

Liberalization of telecommunications, financial services, trade and investment regimes in China are supposed to enhance greatly the competitiveness of its Internet service providers, which are actually working hard to establish rich and speedy Internet sites permitting buying and selling of goods and services, while at the same time securing reliable electronic payment systems.

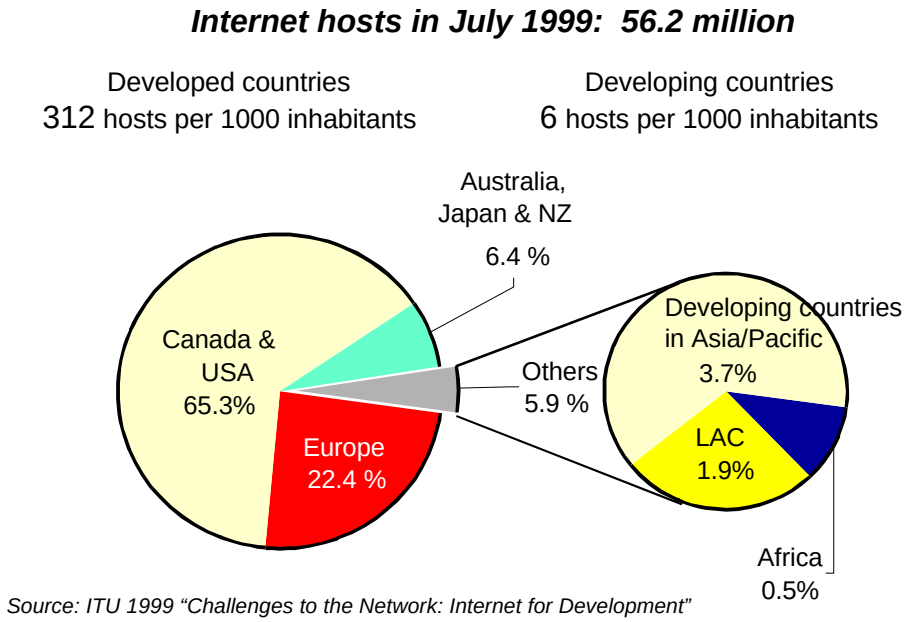
[108] "International Herald Tribune" 8 October 1999, p.7.

[109] For more details see: "Scaling the Great Wall of E-Commerce: Strategic issues and recommended actions", China Electronic Project Report (2nd edition), The Cyber Century Forum, Washington D.C. 1999, p. 183. "I-Ways", GIIC, Third Quarter 1998, Special Report: "China Prepares for E-Commerce", pp.48–65.

This unevenness becomes more acute in the case of world distribution of Internet hosts. While the telephone density is very close to 50 among the first 30 countries in the ITU multimedia-access ranking, the picture looks very different with Internet hosts. Thus while the USA Iceland and Canada have respectively 941, 925 and 892 hosts per 10 000 inhabitants, Italy, Portugal and Greece have only 96, 66 and 54 hosts (35th, 40th and 43rd places in Internet host ranking, respectfully). At the same time the overwhelming majority of countries ranking from 91st place onwards down have less than one Internet host per 10 000 inhabitants.

As the following diagram shows the "brave new world of Internet" is still extremely unequal: two countries, namely Canada and the United States host 65 per cent of all Internet hosts; together with Europe they represent 88 per cent of the world total of Internet hosts. At the same time in spite of the higher rate of increase in Internet hosts in many regions of the developing world all of them still represent a mere 6 per cent of Internet hosts, that is, the level of Japan, which is itself lagging behind the American and Western European competitors.

Figure 11. Share of Internet hosts

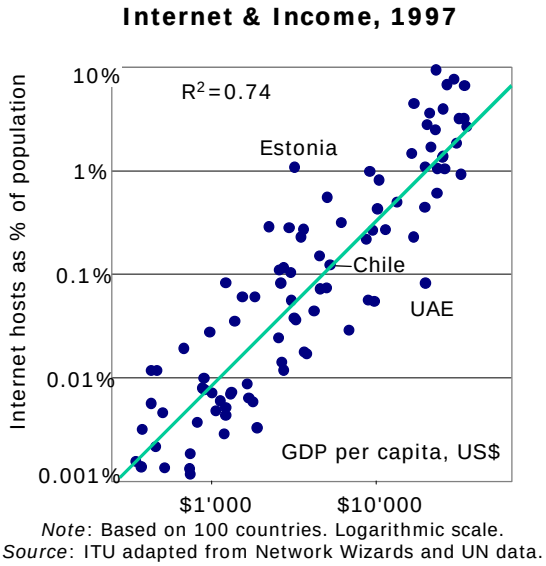


Source: ITU 1999 "Challenges to the Network: Internet for Development"

If one compares the less developed countries the correlation between the use of Internet and the level of per capita income is strong but does not tell the whole story. The comparison between the share of population hosting Internet in various countries and the level of per capita income in the case of the following scatter diagram shows that while Estonia has considerably lower per capita income than United Arab Emirates (UAE), the number of hosts here are 10 times more. The credibility of public policies ensuring a stable legal and institutional framework, and good governance; encouraging open and competitive environment for investors; improving education and training indicators; and acquiring technical assistance from various sources could make the difference here. It should also be clear that all these countries are still at the beginning of a process where even active Estonia

had a bit more than 1 per cent of population hooked up to Internet. At the same time the indicator for Chile, which is considered as a Latin American success story, is also only on the level comparable to UAE that is, a bit more a bit more than 1 Internet host per 1000 inhabitants. For comparison in the USA the proportion is about 1 Internet host for 10 inhabitants while one person in three uses Internet.[110]

Figure 12. Share of internet hosts in relation to income



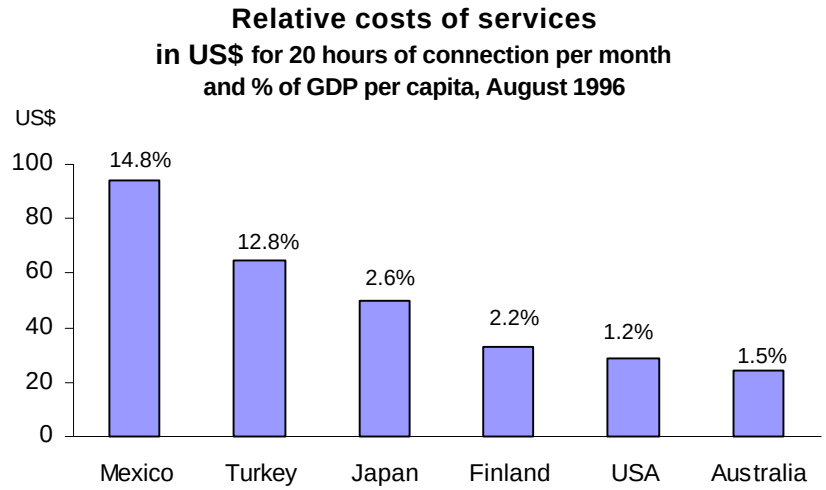
Note: Based on 100 countries. Logarithmic scale.
Source: ITU adapted from Network Wizards and UN data.

Similar linkages and gaps are relevant, while comparing the costs of communications per unit of time: the developing countries are paying on average 3 times more than the OECD average while costs in transition economies are closer to those of OECD countries.

Alongside with country and commercial risk considerations, the main limitation for the availability of investment funds and hence for the expansion of telecommunication infrastructure is the incidence of low purchasing power among the population and high unit costs of telecommunication services in the developing countries. According to the following graph the share of telecommunication costs in the household disposable income even in relatively advanced developing countries is more than 10 times higher than in the USA. Given the lower level of per capita income in the overwhelming majority of other developing countries, spent primarily to meet the basic needs of the population, the cost burden of these 20 hours of connection per month looks even more exorbitant.

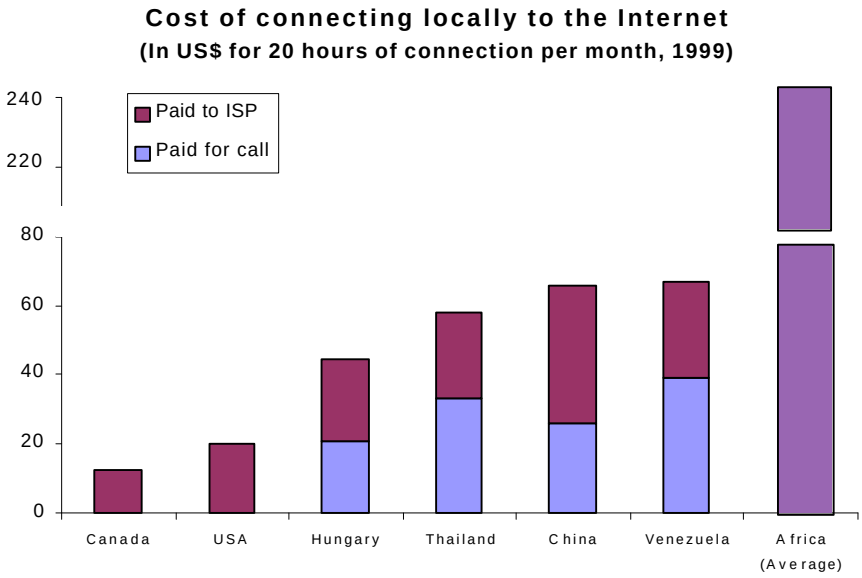
[110] Ibid, *International Herald Tribune*. 8 October 1999, p.7

Figure 13. Relative connection costs



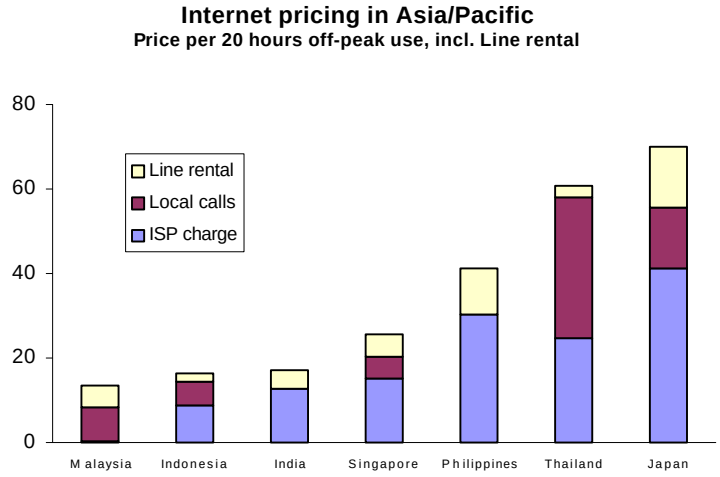
Furthermore, in developing countries the telecommunications costs are high, not only as a share of per capita income but because the users here are paying high prices for local calls that in many countries are included in the cost of Internet connection. At the same time, in Canada, the USA, and New Zealand as well as in India, the Philippines and Russia there is no local call charge for Internet connection. As the following diagram shows, while a Canadian and an American pay less than US$ 1 for an hour of Internet connection (paid to the ISP as there is no charge for a local call), a Thai, a Chinese and a Venezuelan are paying for the same hour more than US$ 3, of which around half goes for a telephone call charge.

Figure 14. Comparative costs of internet use



The picture for Asia is more mixed as both Japanese and South and South-East Asians are paying in various proportions for Internet services, local call charges and line rentals. Moreover, during off peak time a Japanese is paying much more in absolute terms than any user from Asian developing countries presented in the following diagram.

Figure 15. Comparative costs of internet use in Asia–Pacific region



The more complex and expensive cost structure of telecommunications services in many developing countries — and in some developed countries like Japan — are not only a result of the structure of the industry evolved during the last decades but also represent inertia in policy choices, which do not yet adequately take into account the challenge of the Internet era. Decreasing inequality in telecom and Internet distribution among countries and regions, necessitates better and more open policies, encouraging foreign investment and autonomous initiatives of local interest groups as well as greatly enhanced international economic cooperation and technical assistance measures. As the official aid might cover only one-thirtieth of the estimated US$ 60 billion telecommunications-related investment needs of developing countries for the next five years, it is hard to overstate the role of international private investor's trust towards local authorities and business partners. The systematic efforts to create efficient market institutions and regulations should be the central element of the current development paradigm in order to avoid further deepening of the global "digital divide" and an aggravation of social inequities.[111]

The simple observations above point at two major conclusions, namely:

[111] In that respect it is important to note that rapid Internet diffusion is not a panacea itself and should be coupled with consistent policy measures both in terms of leap frog strategies and more even distribution of electronic commerce benefits to the various population groups. Moreover Internet impact can be fully examined only as a long-term phenomenon. So far, some initial assessments are at best inconclusive. Thus within the OECD area the impact of Internet growth on the social inequity measured through inequality of income distribution (so-called GINI coefficient) shows that in most advanced Internet user countries such as the USA and the United Kingdom dynamic Internet diffusion did not stop the GINI coefficient from worsening. The same observation also proved to be true for China. At the same time, in the Scandinavian countries, which are the most active Internet hosts in Europe, the Internet explosion did not affect the measure of social inequality.[111] In other words, while Internet seems to become an essential instrument to further the cause for development of a country as a whole and to improve its position in the world economy, the national policies and institutions are still primordial for the efficient use of electronic commerce for development as well as for better distribution of the Internet impact on different groups of population.

- the possibility of a worsening North–South digital divide is real, and needs to be addressed: electronic commerce should be considered as a tool to involve more enterprises, more individuals and more institutions from developing countries in the actual use of information technologies and information networks;
- physical access is not the only obstacle in the way of developing countries that are willing to join the e-commerce revolution: economic conditions in which the relevant equipment, network and services can be used are also a potent factor in determining where the digital divide may run, including inside individual countries; in many cases, prevailing price structures appear as a "self-inflicted punishment" which hinders countries' abilities to compete in global markets.

The following section, which focuses on Africa, further illustrates these points.

Section II — E-commerce in Africa[112]

The general picture

1. Introduction

The growth and potential of electronic commerce has recently captured the attention of businesses, consumers, the media and government officials, and the topic is now high on the policy agenda of many countries, including a number in Africa. While its place in the spotlight is new, electronic commerce (e-commerce) has existed for some time. It is the Internet, with its open, non-proprietary standards, exploiting existing communications infrastructure, that lies behind the growth of electronic commerce.

However, while many commentators hold the view that e-commerce has many advantages for developing countries, the African continent has a number of major challenges to overcome before it can more fully exploit the benefits of e-commerce. These include the low level of economic development and small per-capita incomes, the limited skills base with which to build e-commerce services, the number of Internet users needed to build a critical mass of online consumers and the lack of familiarity with even traditional forms of electronic commerce such as telephone sales and credit card use. However the most critical barrier can be ascribed to the very limited information and communication infrastructure available in most countries in Africa.

This report aims to analyse the current status of Africa's readiness for e-commerce and identify possible strategies for its improvement, highlighting the major challenges and opportunities presented by the requirements of a digital economy. While new policies, laws and regulations needed to promote the use of electronic commerce can be relatively quickly put in place, it will be a much longer process and harder task to upgrade the information and communications infrastructure that is fundamental to realizing the full benefits of e-commerce. Therefore this report is divided into two parts; the second part comprising a more detailed assessment of the current status of the infrastructure available for e-commerce and strategies that have been adopted in various countries to improve it.

[112] This Chapter is an extraction of a paper entitled "E_Commerce in Africa: An Assessment of Status and strategies", prepared by Mike Jensen, UNCTAD Consultant.

2. Overall assessment of e-commerce potential in Africa

With the low level of basic telephone service penetration, and access to computers and data services even lower, the possibility of participating in national and global electronic markets is remote for much of the continent's population. While the infrastructure has improved dramatically over the past five years, computers and telephones are still very scarce and most of the lines are concentrated in the urban areas, while over 70 per cent of the population is rural. There are fewer than 100 000 dialup Internet accounts for the over 750 million people outside South Africa, and because Internet service providers are usually concentrated in the capital cities, it is a long distance call to the Internet for most of the (predominantly rural) public.

As a result, consumer-based e-commerce within Africa is unlikely to have as much impact in the short term as business-to-business e-commerce, which holds the most immediate potential. But it is likely that trade between African businesses and the much larger mass of e-consumers in developed countries will have even greater impact. Business-to-government e-commerce also shows some promise, although with the poor resources of the public sector in most countries, this is unlikely to be as important. However, it is dangerous to generalize about the diverse national environments in Africa and some countries are already showing strong interest in the adoption of e-commerce. As would be expected these are largely confined to the better developed economies of Botswana, Egypt, Mauritius, Morocco, Namibia, South Africa, Tunisia and Zimbabwe.

3. E-commerce for the African consumer

In the longer term, prospects for consumer e-commerce are likely to be better in the countries that have adopted a progressive e-commerce policy framework which includes steps to improve their information and communications infrastructures.

Most of the countries have separated postal functions from telecommunications and many have instituted a separate regulatory authority. While international capital and strategic partners have been obtained by some of the public telecommunications operators (PTOs), few second operators have been established as yet. Early liberalization of the market for value-added services in some countries has also resulted in growth in the number of data, paging and other service providers.

There have also been some noteworthy efforts to expand telecommunications to rural areas through the institution of Universal Service Obligations among both public and private operators, in the establishment of funds for rural communications development, in setting targets for provision of services and in the rollout of national networks.

Cellular providers have been licenced in almost all the countries, which has been a major advance for busy decision-makers and has brought network coverage to many rural areas along trunk roads that would otherwise have had no telephone network at all. However, roaming and data services are not usually available and tariffs for calls are substantially higher than the fixed network, which does not make it affordable for web access. As data rates are restricted to 9.6 baud (about 4 times slower than a normal dialup connection), this further reduces mobile telephony's applicability for e-commerce, although newer third-generation cellular systems, which will probably be adopted by the next tranche of cellular market entrants, are expected to address this problem. The extensive use of wireless data services in the few countries that have sanctioned its use is also worthy of note.

Generally, Internet access costs need to come down substantially before a wider spread of the population can make use of e-commerce. Overall, it can be seen that service levels have improved and costs have come down when ISPs are free to establish their own independent links to the Internet, rather than being forced to go through the incumbent telecommunication operator's infrastructure. At the same time, telecom operators can play a

vital role in reducing the costs for those who are a long distance call from the Internet. However, even in the case of a local call to the Internet, costs are still relatively high, constituting most of the total cost of regular Internet access.

With the very low penetration levels and limited resources that consumers in Africa have for telephones, computers and the Internet, especially in rural areas, shared multi-purpose public access facilities run by entrepreneurs and communities, commonly known as telecentres, are now becoming popular across the continent.

E-commerce activities are likely to grow as access through telecentres increases and spreads further into rural areas, aided by developments in low-cost satellite technology to provide connectivity where there is no terrestrial network. Very small aperture terminals (VSAT), such as those planned by RASCOM and Tachyon, coupled with local terrestrial wireless redistribution, is being considered as a model. The use of digital satellite broadcasting services to provide a high-speed downlink is already being tested in South Africa with low-cost long-distance terrestrial radio modems to link remote groups to the nearest telecentre phone line.

Growth in consumer electronic commerce is also likely to drive telecentre expansion because the availability of local e-commerce services is expected to radically increase the demand for multi-purpose telecentre services. This is expected to improve their sustainability by providing more useful and relevant applications for the average rural African, provided they can be coupled with efficient transport and delivery systems for physical goods.

Probably a more major problem for rural areas is the limited development of the power supply networks. Even some capital cities in Africa have power sharing and many rural areas may only have power for limited periods in the evening, if at all.

E-commerce strategies that exploit the much greater penetration of radio and television in Africa are also likely to be important. Sensitization and awareness-raising about the opportunities of e-commerce and improving consumer confidence in electronic transactions are a natural fit with these media, but more innovative approaches to their use for effecting transactions (such as notifying community members about a delivery at a telecentre, or a trade opportunity) could also be used.

Sensitization and public education are likely to be a key component in any programme to encourage consumer e-commerce as there is also likely to be public reticence in using these systems due to the preponderance of the informal economy, unfamiliarity with the technology (including using a telephone) and lack of a tax-paying culture. In general, African Governments are probably going to need to review their tax rules and address balance of payments issues to ensure that other barriers to e-commerce do not develop. However, initially this is likely to be less of a problem than the lack of local online payment facilities and prohibitions on using credit cards for transactions involving foreign payments present in many of the countries.

4. E-commerce for African business

Businesses are not as directly constrained by lack of resources in using e-commerce as consumers are, but they face the same infrastructure problems, which can easily throttle the growth of e-commerce related trade. Nevertheless, sufficient infrastructure to begin e-commerce activities is present and growing in most countries and business use is as likely to be constrained by such government policy issues as limited acceptance of electronic documents, inadmissability of digital evidence in court, lack of efficient or cost-effective delivery services and slow customs clearance and licensing procedures.

In the area of customs clearance and delivery services the Advance Cargo Information System (ACIS) developed by UNCTAD is being adopted by about 15 African countries. ACIS

is a logistics information system designed to improve transport efficiency by tracking equipment and cargo on transport modes (rail, road, lake/river) and at interfaces (ports, internal clearance depots) providing information in advance of cargo arrival.

The provision of local authentication facilities and the building of consumer confidence will also be critical for Governments to deal with if businesses with local markets are to begin to adopt e-commerce. In addition, the adoption of a uniform commercial code, the extension of trademark rights to the digital environment and the related issue of domain name rights will also need attention.

4.1 The NICI Planning Process

Many of these government policy issues are likely to be addressed by the countries that are developing national information and communication infrastructure (NICI) planning processes. Because responsibilities for various elements of electronic commerce-related policies are usually in different departments, limited collaboration between them has resulted in little progress being made towards a consistent set of polices for enabling e-commerce. The aim of the NICI process is to develop a coordinated strategy and a consistent set of policies from the different government departments. The African Information Society Initiative (AISI) endorsed by all African Ministers of socio-economic planning identified the need for multi-stakeholder groups in every African country to formulate and develop a national information and communication infrastructure plan driven by national development priorities. As of mid-1999, some 25 African countries have begun the NICI process, of which 10 had advanced plans and submitted reports, 10 were actively working and 5 had just started.

Outside of the NICI process, Kenya, in May this year, held a workshop to assess the status of e-commerce and propose a way forward. The symposium took a decision to establish a National Task Force to harness all efforts to support the development of e-commerce. Table 9. Examples of National Information and Communication Infrastructure Planning in Africa

Country	Process	Stage
Mozam–bique	Commissao para a Politica de Informatica da Republica formed, consisting of the Prime Minister, the Ministers of Education, Planning and Finance, Transport and Communications, the Vice Rector of the University, the commercial director of the PTO (TDM) and an executive secretary. Various workshops held with participation from the major public institutions and the private sector to develop the draft document. Major \ of focus are: Information legislation, intellectual property, data privacy and protection, “decency” of content, telecommunication infrastructure, private/public sector partnerships, research and education networks, graphical information systems (GIS), health informatics, human resource development, electronic commerce, universal access to information and international co-operation. IDRC's Acacia programme is assisting with the process.	Commission established in 1998. Document to be submitted to parliament before the 1999 elections.
Mauritius	The National Computer Board (NCB) manages a National IT Strategy Plan (NITSP) which is currently under active development as part of the Mauritius' Government's strategic objectives to move the country toward an information age economy. The Phase 1 study was carried out in 1997 with assistance from National Computer Systems (NCS) Singapore and following an innovative “gap analysis” which compared the current status of the “infostructure” to the visions of Mauritian leaders, five medium-term objectives have been adopted for the proposed Phase II of the NITSP: To enable the service sector to grow and develop into a business hub, especially through financial services and e-commerce; To improve efficiency and effectiveness of public services; To bring the Government closer to its people; To create a fully IT literate nation; and To enhance the education system and services.	Phase II of the project has started which includes a Government Information Infrastructure (GII) and a smart card and database on every Mauritian.

	Table 9 continued	
Country	**Process**	**Stage**
Senegal	Senegal commissioned a study entitled "Senegal 2015" in 1997 to examine the potential of NICI in various spheres of the economy. IDRC is the major funding agency.	tbd
Gambia	The Department of State for Public Works, Communication and Information initiated formulation of a National Communications and Information Policy (NACIP) aimed at ensuring "the coherent and orderly development of broadcasting, telecommunication, print media and post & courier services". Its main thrust is the promotion of effective public/private partnerships in the provision of information and communication services underpinned by a transparent and effective regulatory framework. Objectives include: provision of universal services in broadcasting and telecommunication, creation of opportunities for private sector participation, creation of wider consumer choice in services, guarantees on the freedom and independence of the press, the development of a national information infrastructure and its connectivity to the GII, and the fostering of cohesiveness and understanding between Gambia's diverse people and cultures. Other activities include a review of sector legislation	Policy development process was initiated this year (99).
Ghana	Ministry of Environment, Science and Technology, with the Ministry of Transport and Communication. A draft national information and communications policy has been developed by the Ghanaian National Information and Communications Committee (GNICC) which comprises representatives from the academic, research, government and private sectors and co-ordinated by the University of Ghana, Legon, Balme Library. Support for the GNICC has been widespread, including Government, with participation from the ministries of environment, science and technology, education, information, transport and communication. The Ghana Government has indicated its support for promoting access to ICTs in all segments of society, particularly in the educational system.	Adopted by Government.
Tunisia	The Secretariat d'état à l'informatique (SEI) has developed a national strategy for the period 1997-2001 with emphasis on information and communications infrastructure and e-commerce.	In Process
Uganda	Process managed by the Department of Information in the President's Office . Stakeholder groups are aiming to develop a "National IT Policy". Areas of initial focus are: 1. Universal access, 2. Human resource development, 3. Support for good governance, 4. Promotion of Cultural heritage, 5. Appropriate infrastructure development, 6. Support for business development.	Developing a concept framework on which the policy consultation and development process will be based.

Source: M. Jensen

4.2 Human Resource Development

It is clear that the availability of sufficient human resources will continue to be an overriding issue in many areas of e-commerce. Awareness-raising is also in some respects a human resource development issue which will continue to be important, as is the more general need to develop the capacity to deal with the rapid changes being brought on by the use of new technologies. The major problem in the area of human resource development is that the pool of expertise in the region is relatively small (at all levels, from policy making down to use). Rural areas in particular suffer with very scarce expertise in computer maintenance and software troubleshooting.

This situation is not unique to Africa or developing countries, but is also being faced by the developed world where infrastructure and application development demands have also outstripped the supply of experienced staff. Moreover the situation in the North is simply exacerbating the situation in Africa, because experienced local technicians are easily able to find much higher paying jobs in Europe and North America.

Currently the availability of specialist training in infrastructure operation and installation is extremely limited on the continent. In Africa there are only two major regional centres for

training in telecommunications — ESMT in Senegal for Francophone countries and AFRALTI in Kenya for Anglophone countries. Through an International Telecommunication Union (ITU) support programme they are expected to be transformed into Centres of Excellence in Telecommunications Administration (CETA). CETA is intended to provide senior-level, advanced training and professional development in the areas of telecommunications policies, regulatory matters and the management of telecommunications networks and services.

A number of telecommunication operators maintain their own training schools but these usually suffer from the same lack of financial resources experienced by the operators themselves. The international community has helped to a certain extent with this problem, for example the German international technical training assistance agency, Carl Duisberg Gesellschaft (CDG), has sent hundreds of telecom trainees to Germany over the last 20 years, and many other development agencies have similar, if small, programmes. Other examples of the wide range of projects in this area that have been instituted include:

- The Establishment of a Global Telecommunications Academy by the ITU. This will operate as a brokerage service for distance learning courses.
- In the Internet area, the Internet Society runs an annual training workshop for developing countries where in-depth training is given to participants who are sponsored through funds raised by ISOC from the private sector.
- In Cameroon, UNITAR and ORSTOM have collaborated in a joint project focusing on technical capacity-building in sub-Saharan Francophone Africa. The first training centre and courses have been established in Cameroon (CITI-CM) with support from the World Bank's InfoDev fund, and additional funds from Orstom, the Agency for Cultural and Technical Cooperation (ACCT) and others. Funds are being sought for CITI-CI (Côte d'Ivoire), CITI-SN (Senegal), CITI-BF (Burkina Faso), CITI-BE (Benin) and CITI-ML (Mali). At CITE-CM a network engineering course is now being run regularly.
- An Internet training programme for institutes, schools and other agencies of higher learning in Francophone and Lusophone sub-Saharan African countries called Internet pour les Ecoles Inter-Etat d'Afrique de l'Ouest et du Centre has been established in a related effort under the Diderot Initiative. The first seminar was held in Montpellier, in July 1997, with support from INRIA and financed by the French Ministry of Co-operation.
- COMNET-IT, established by the Commonwealth Secretariat (ComSec) in Malta to support information and communication technologies (ICTs) in Commonwealth developing countries, also a number of ICT support activities such as the provision of scholarships for Commonwealth country students to obtain post-graduate degrees in computer science.

4.3 Global, sub-regional and international perspectives

With one of the overriding features of e-commerce being its independence of distance, global and international developments can have an almost immediate effect worldwide. For example, global changes in trade processes toward the use of only electronic transactions will put increasing pressure on Governments in Africa to accommodate similar procedures if their local businesses are to be able to succeed in the global marketplace. Similarly, e-commerce issues relating to the Intellectual Property Rights are increasing with the growth of e-commerce and the use of the Internet worldwide. Protection of intellectual property is a complex issue that is often insufficiently dealt with at the national level with respect to new technological developments. However so far participation by African nations in many of the global forums and treaty organizations which relate to e-commerce has been limited.

In particular, African countries have so far been rather slow to become signatories to many of the WTO and WIPO treaties. Only 5 countries committed themselves to the WTO treaty on opening up telecommunication services to competition. Although 29 African countries have adopted the Patent Co-operation Treaty, only 6 countries adopted the Hague Agreement on International Deposit of Industrial Designs, and 9 countries the Madrid Treaty on the International Registration of Marks. (See tables 11-13).

Table 10. WIPO Copyright Treaty (not yet in force)

(Geneva, 1996) Status on July 19, 1999

African signatories

Burkina Faso	Namibia	South Africa
Ghana	Nigeria	Togo
Kenya	Senegal	

Table 11. African contracting parties of the Madrid Treaty on the International Registration of Marks administered by WIPO.

Agreement on Treaty, (1891 with major revisions in 1967 — Stockholm Act— and in 1989 — Madrid Protocol). Below are the dates on which the listed states became party to the various agreements.

State	Agreement	Stockholm Act	Madrid Protocol
Algeria	July 5, 1972	July 5, 1972	
Egypt	July 1, 1952	March 6, 1975	
Kenya	June 26, 1998	June 26, 1998	June 26, 1998
Lesotho	February 12, 1999	February 12, 1999	February 12, 1999
Morocco	July 30, 1917	January 24, 1976	October 8, 1999
Mozambique	October 7, 1998	October 7, 1998	October 7, 1998
Sierra Leone	June 17, 1997	June 17, 1997	
Sudan	May 16, 1984	May 16, 1984	
Total*	62	51	39

** Total states worldwide that have become party to the agreements.*
Source: WIPO

Table 12. Hague Agreement Concerning the International Deposit of Industrial Designs[a]
(1925 and 1934 — London Act — , 1960 — Hague Act, and 1967 — Complementary Stockholm Act)

State	Agreement	Hague Act	London Act	Comp. Act
Benin	November 2, 1986	November 2, 1986	November 2, 1986	January 2, 1987
Côte d'Ivoire	May 30, 1993	May 30, 1993	May 30, 1993	May 30, 1993
Egypt	July 1, 1952	July 1, 1952		
Morocco	October 20, 1930	January 21, 1941		
Senegal	June 30, 1984	June 30, 1984	August 1, 1984	June 30, 1984
Tunisia	October 20, 1930	October 4, 1941		
TOTAL *	29			

** Total states worldwide that have become party to the agreements. – Status as of July 1999 – Source: WIPO*
[a] The Geneva Act of the Hague Agreement, adopted on 2 July 2 1999., is open for signature until 2 July 2000.

Table 13. Patent Cooperation Treaty (1984) . Status on 15 July 1999

State (out of 104 signatories)	Date State became party to the Treaty
Benin	February 26, 1987
Burkina Faso	March 21, 1989
Cameroon	January 24, 1978
Central African Republic	January 24, 1978
Chad	January 24, 1978
Congo	January 24, 1978
Côte d'Ivoire	April 30, 1991
Gabon	January 24, 1978
Gambia	December 9, 1997
Ghana	February 26, 1997
Guinea	May 27, 1991
Guinea-Bissau	December 12, 1997
Kenya	June 8, 1994
Lesotho	October 21, 1995
Madagascar	January 24, 1978
Malawi	January 24, 1978
Mali	October 19, 1984
Mauritania	April 13, 1983
Morocco	October 8, 1999
Niger	March 21, 1993
Senegal	January 24, 1978
Sierra Leone	June 17, 1997
South Africa	March 16, 1999
Sudan	April 16, 1984
Swaziland	September 20, 1994
United Rep. of Tanzania	September 14, 1999
Zimbabwe	June 11, 1997

Source: M. Jensen

Regional economic bodies such as the Economic Community of West African States, the Southern African Development Community (SADC) and the Common Market for Eastern and Southern Africa (COMESA) have more general economic and trade co-operation programmes, but modernization of these for e-commerce has been little discussed and there is no continent-wide forum for promoting common e-commerce policies. SADC has begun to lay some of the groundwork for an e-commerce policy with its Theme Document — SADC in the Next Millennium — The Opportunities and Challenges of Information Technology.

4.4 Trade Promotion

African businesses involved in exporting products have been the first to gain through more widespread use of e-commerce internationally. Growing numbers of local exporters are establishing low cost websites, often hosted in the United States or Europe with the aim of presenting a window to world markets. This is usually the first step, followed by joining a consolidation of suppliers in a virtual “electronic-mall” or “industrial park” that brings more traffic and attracts a greater critical mass of potential customers. These can take many forms, some of which are various trade opportunity networks, one of which is the UNCTAD ETO System. Over 10 000 organizations worldwide receive ETOs via email.

Table 14. UNCTAD Trade Points in Africa (mid-1999)

Operational:		
Egypt — Cairo, Alexandria, Ismalia, Kafr El-Shiekh, Portsaid, Tenth of Ramadan	Morocco — Casablanca	Tunisia — Tunis
	Senegal — Dakar	Zimbabwe — Harare
Under Development:		
Côte D'Ivoire	Kenya	Uganda
Ethiopia	Mauritania	
Government requests submitted:		
Angola	Madagascar	Sudan
Chad	Malawi	Tonga
Djibouti	Namibia	
Lesotho	South Africa	
Feasibility phase:		
Algeria	Eritrea	Mauritius
Benin	Gabon	Mozambique
Botswana	Gambia	Sao Tome and Principe
Burkino Fasa	Ghana	Tanzania
Cameroon	Guinea-Bissau	Zambia
Cape Verde	Mali	

Source: M. Jensen

Another common trade opportunity network is the World Trade Centers Association — WTCA On-line. There are 15 WTC Trade Centers in Africa — Alexandria, Algiers, Cairo, Casablanca, Dar Es Salaam, Hurghada, Johannesburg, Lagos, Maputo, Nairobi, Port Said, Rabat, Tripoli and Tunis.

There are also various informally produced directories of businesses on the web, notably in Egypt, Kenya, South Africa, Senegal, Swaziland, Tunisia, Uganda. A growing number of countries also have guides for foreigners in doing business locally, either produced by business consulting groups, (such as Mbendi and Ernst & Young), or by national Investment Promotion Centers (e.g. Côte d'Ivoire, Ghana, Kenya, Senegal and South Africa), and also most notably by the US Department of Commerce and United States Embassies in various African countries.

4.5 Sectoral perspectives

Electronic commerce represents a major opportunity for small and medium-scale businesses to compensate for their traditional lack of access to national and international markets. SMEs are typically less able to manage the fixed costs involved in assessing and adopting the benefits of investments in new technologies. There is thus a strong rationale for Governments to address the problems that impede SMEs from adopting and using ICTs and electronic commerce. However, there have been few projects in Africa specifically aimed at supporting these SMEs in the use of e-commerce so far.

Music, books and other publications are traditionally one of the early and most high volume areas of consumer e-commerce internationally. Many Africans already use services such as Amazon.com to purchase books and CDNOW to obtain music CDs. Although an obvious candidate for e-commerce, the African banking sector has so far been quite conservative in developing online banking facilities, with the exception of South Africa where all 6 of the major banks are online. The only other countries which have bank websites that are more than simply a contact page are Botswana, Egypt, Morocco and Tunisia.

Although there are a few notable official general government websites, such as those of Angola, Egypt, Gabon, Mauritius, Morocco, Mozambique, Senegal, Togo, Tunisia and Zambia, there is as yet almost no discernible government use of the Internet for existing administrative purposes relating to e-commerce. Egypt's MisrNet Government website does however provide details and procedures for applying for an electricity supply point and a telephone line.

Web presence is higher in some sectors, particularly those involved in tourism and foreign investment, and these often have more mature sites, aimed at developing an international market presence. While most ministries and national research centres may have access to electronic mail, very few have a website.

The involvement of government agencies in purchasing through electronic channels can have a catalytic benefit on the local electronic commerce environment in a given country because Governments are often among the largest buyers of goods and services from the private sector. However so far only Tunisia and South Africa appear to have government tenders posted on the web.

As far as regional intergovernmental agencies are concerned, so far ACMAD, African Development Bank (ADB), CEDEAO, COMESA, UN Economic Commission for Africa (UN-ECA), IGAD and SADC have built websites with a substantial amount of information on their activities and their member states.

Advertising-driven information delivery is relatively common amongst African ISPs, many of which display banner advertising for international and local companies on their websites. Two web search engines or portals specializing in Africa have emerged over the last year — Orientation Africa http://af.orientation.com and Woyaa — http://www.woyaa.com.

Status of Africa's infastructure for E-commerce and strategies for its improvement

1. Introduction

There is no doubt that the infrastructure for e-commerce in Africa has improved dramatically over the past few years (see Map 2). Satellite television, the Internet and cellular phones are now widespread on the continent. But while this might have been unthinkable a decade ago, access to these services are beyond the reach of the majority of Africans — the 70 per cent on the continent who do not live in the major cities or are not part of the privileged few. There are only about 100 000 dialup Internet accounts for 750 million people (excluding South Africa) and because Internet Service Providers are usually concentrated in the capital cities, even if there is a computer available, it is usually a prohibitively expensive long distance call to the Internet.

While the overall picture of Africa's infrastructure for e-commerce is generally gloomy, there have been some notable improvements in some countries over the last few years, and the averages given above obscure large variations in the capacity of the underlying infrastructure. This section of the report therefore aims to assess the current status of the infrastructure and to highlight the various strategies that are being used or could be considered in order to improve the infrastructure needed for effective use of e-commerce.

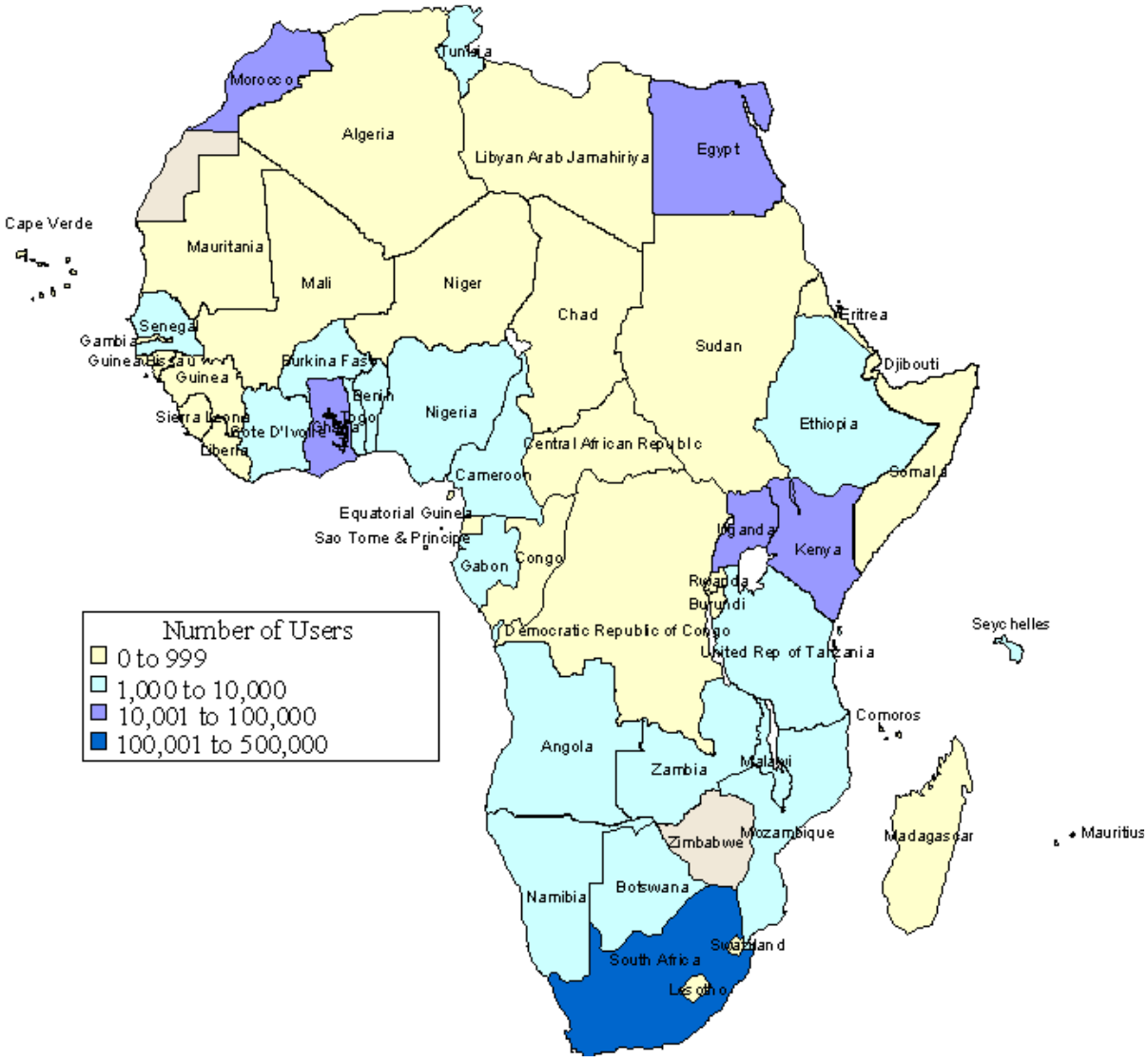
Of crucial importance to this physical infrastructure are the human resources required to install, use and maintain it, and the linked infrastructures — the transport and power supply networks.

2. The general contrext for e-commerce infrastructure development in Africa

Access to the information channels and communication tools required for e-commerce in Africa have until recently been largely in the hands of state monopolies. But now that the trend towards more liberal market-oriented policies has become established on the continent, there is a marked improvement in the availability and diversity of information and communication channels. By the end of 1999, the Internet was expected to be available in the capitals of every country in Africa, up from only 12 countries three years ago.

Although encouraging trends have emerged in the last few years, the differences between the development levels in Africa and the rest of the world are even wider in the area of information and communication technologies (ICTs) than they are using more traditional measures of development. Only 2.5 per cent of the world's televisions are on the continent (which has 13 per cent of the world's population), the overall teledensity is still only about 1 per 200 inhabitants, computer penetration is less than 3 per 1000 and just 1 in 1500 has access to the Internet, compared to a world average of about 1 in 40.

Map 1: African Internet Populations — Number of Users (March 1999)



Source: M. Jensen

The level of development of the transport networks in Africa usually follows the same pattern of limited distribution seen in the telecommunication and power networks. This results in further barriers to the increased movement of people and physical goods expected from the increased use of e-commerce and more generally in the use of ICTs to accelerate transactions and decision-making.

Given the conditions described above, it is not surprising that radio is still by far the most dominant mass medium in Africa, with ownership of radio sets being far higher than for any other electronic device. Furthermore, many people listen to the same radio or watch a television at the same time. As a result any e-commerce strategies would be deficient if they did not take into account the much greater access that these traditional media provide to the African public.

In summary, the major barrier to increased use of e-commerce is the lack of pervasive low-cost telecommunications, broadcasting, Internet services and linked infrastructures, especially in the rural areas.

3. The primary infrastructure — telecommmunication and broadcasting services

3.1 Telecommunications

Although there has recently been a rapid increase in the rate of expansion and modernization of fixed telecommunication networks, this is from a very low base and much of the growth is in the urban areas. On a worldwide basis, the sub-Saharan Region can be seen to have by far the least developed infrastructure in the world. In 1996 the region contained almost 10 per cent of the world's population, but only 0.4 per cent of the world's telephone lines (about 3 million lines, excluding North and South Africa).

The limited teledensity in Africa is linked to the fact that a much smaller proportion of the population can actually afford their own telephone line — the ITU found the cost of renting a connection averaged almost 20 per cent of the 1995 GDP per capita, vs. a world average of 9 per cent and only 1 per cent in high-income countries. In 1996 the ITU determined that the average business connection in Africa cost US$ 112 to install, US$ 6 a month to rent and US$ 0.11 per three-minute local call. However, this hides a very large variation between countries in the charges for installation, line rental and call tariffs. Installation charges were above US$ 200 in some countries (Benin, Mauritania, Nigeria and Togo), line rentals ranged from US$ 0.8–20 a month, and call charges varied by a factor of almost 10 — from US$ 0.60 an hour to over US$ 5 an hour. Since then local call tariffs in some countries have increased even further, to over US$ 8 an hour (Chad, Gabon and Uganda) making extensive use of the Internet in these countries unaffordable to all but the larger organizations and a tiny domestic elite.

Despite the high cost of installation and line rental for private phones, the number of public telephones is still much lower than elsewhere — about 1 for every 17 000 people, compared to a world average of 1 in 600. However an increasing number of operators in Africa are now passing over the responsibility for maintaining public telephones to the private sector and there has been a rapid growth of private phone shops in some countries.

Francophone countries in Africa have a variant of the privately run phone shop and a growing number of Anglophone and Lusophone public telecom operators (PTOs) have adopted similar strategies. Many of these private phone shops are now also adding computer and Internet services to their suite of facilities (see the Internet section below).

PTOs in Botswana and South Africa provide a “virtual phone” alternative for those unable to obtain their own phone. Subscribers are issued with their own unique phone number and pay a small rental for a voice mailbox, from which they can retrieve their messages from any

telephone. A pager can also be tied to the system to immediately inform the subscriber that a message is waiting.

Smart card-based public phones have also been widely adopted across the continent, creating a new revenue stream in the sale of air-time by small shops. As the stored funds on a smart phone card can be used for other telephone-based value-added services than simply voice calls, this infrastructure could form the basis for some types of e-commerce services, especially if more universal smart-card systems are adopted (see below), including the ability to use the same cards in different countries.

Cellular services now comprise about 20 per cent of the total phones on the continent (outside South Africa) and are available in 42 countries, supplied by about 80 operators who provide access mainly in the capital cities but also in some secondary towns and along major trunk routes. A majority of the systems in use in Africa are now based on the digital GSM standard, although international roaming agreements and data communication facilities are rare and need to be encouraged.

The number of cellular subscribers in 1997 was estimated by the ITU at over 225 000 outside of South Africa and is probably closer to 600 000 today. About half the countries have more than one operator, with two being the norm, although a growing number of countries, including Madagascar and Zambia, have three operators, while Tanzania has 5 cellular providers. Prices for cellular usage are high, averaging over US$ 0.50 per minute, although surprisingly the new monopoly cellular operator in Ethiopia recently introduced a service that has the lowest tariffs in Africa — about US$ 0.30 per minute.

The continent (excluding South Africa) has only 2 per cent of the world's international telecom circuits — about 16 000. The use of fibre optic cable for international traffic is still in its infancy in Africa and most international telecom connections are carried via satellite.

Telex use continues to decline in Africa, but not as quickly as elsewhere — the number of subscribers declined by only 5 per cent to 28 600 between 1990 and 1996, while the world average decline was over 15 per cent, and over 20 per cent for high income countries. Fax usage is hard to estimate as not all imports and attachments to the network are recorded, but the ITU estimates just over 100 000 fax machines in the sub-continent outside of South Africa — 0.2 per cent of the world's total.

Table 15. Countries with automatic teller machines

Countries with VISA Automatic Teller Machines (http://www.visa.com)

Algeria	Mauritius	South Africa
Botswana	Morocco	Tunisia
Egypt	Namibia	Zimbabwe 19/4(Gweru)
Kenya	Seychelles	

Countries with Mastercard Automatic Teller Machines (www.mastercard.com)

Egypt	Senegal	Zimbabwe
Kenya	Seychelles	Zambia
Mauritius	South Africa	
Morocco	Tunisia	

Source: M. Jensen

Traditional data communication services based on X.25 are available in over half the countries (29), most prevalently in the Francophone ones, which adopted the use of the Minitel before the Internet became available. Prices for international traffic on the PSDNs in Africa are often US$ 10–15 per 64 kilobytes, although some value-added networks such as SprintNet roll average traffic charges into an hourly rate which usually varies between US$ 24 and US$ 30 per hour. The airline network — SITA — operates its own packet switched network in over 40 African countries and charges vary between US$ 10 and US$ 35 per hour.

3.1.1 Initiatives to improve telecommunication infrastructure

3.1.1.1 Major projects. Communications ministers from over 40 African countries have provided high-level endorsement for telecommunications development policies encapsulated in their common vision document called the African Connection, published last year. Aimed at supporting the development of the underlying infrastructure required by AISI, the target is to lay 50 million lines in Africa over the next 5 years.

The region's links to the rest of the world are also in for substantial change as a large number of international telecommunication infrastructure-building initiatives have been announced in the last 2–3 years. Aside from projects aimed directly at the African market, a number of the LEO satellite projects planned for the much larger European and North American markets will also cover Africa, simply because the satellites must orbit the planet.

One of the most well-known telecom projects is Columbia Technology's Africa-One which aims to put an optical fibre necklace around the entire continent. After some years of dormancy, the US$ 1.6 billion project[113], which was originally lead by AT&T, has been given the go-ahead and is expected to be completed in 2002, with Lucent and Global Crossings being the major contractors. Other major projects include:

The South African PTO (Telkom) initiated SAFE (South Africa–Far East) cable, in collaboration with Malaysia Telecom, which will lay fibre between South Africa and Malaysia with various spurs along the way, including Mauritius.

The SAFE project has recently been combined with the SAT-3/WASC (South Atlantic Telephony/West African Submarine Cable) and this section of a West African coastal marine fibre cable has now been finalized for operation in 2003. PTOs in 10 Countries have commissioned Alcatel to build the US$ 265 million network with a trunk connecting Côte d'Ivoire, Ghana, Senegal, South Africa and Portugal and branches to Angola, Benin, Cameroon, Gabon and Nigeria. A management system for the route to Asia is also being supplied by Alcatel.

The establishment of the Atlantis 2 fibre optic submarine cable links West Africa with South America and Europe.

The African satellite consortium owned by the African PTOs — RASCOM — has advanced plans to launch its own satellite before the year 2000. In addition, the ITU has announced the availability of some funds through its Initiative 2000 project to assist in improving the most glaring gaps in the PANAFTEL terrestrial network.

[113] US billion, that is thousand million.

The Common Market for Eastern and Southern Africa has recently agreed to establish a company called ComTel which will work with member states to improve the terrestrial telecom infrastructure links between neighbouring countries.

ECOWAS plans to upgrade its regional telecommunications network (INTELCOM) in West Africa. INTELCOM established communication links between all the 16 capitals of the member states and INTELCOM II is being planned to modernize and expand the existing network.

The East African Co-operation (EAC) has established a US$ 60m project to set up a high-speed digital fibre optic backbone linking Kampala, Nairobi and Dar es Salaam.

The US–Russian joint venture company Lockheed Martin Intersputnik intends to provide satellite transmission capacity and value-added services including video and data distribution to customers in Africa.

The ITU's Infrastructure Development project allocated 4 million Swiss francs to assist in the upgrading and modernization of the terrestrial telecommunication links between neighbouring countries in Africa (Panaftel).

Other satellite networks, such as East, Tachyon, Skybridge and Celestri promise multimedia voice and data communications, and there is even a serious prospect of an "Internet-in-the-sky" using helium-supported stratospheric telecommunications platforms tethered 18–20 km above urban areas. Various worldwide LEO satellite networks have also been launched, or shortly will be, such as Iridium, Globalstar and Teledesic.

3.1.1.2 Universal service objective. In defining priorities for telecommunication network development an increasing number of African countries are setting universal service objectives (USO) for the provision of telecommunication services. The effective use of Internet and other advanced services requires a significantly higher level of knowledge and skills, as well as more specialized equipment such as computers. But as yet, USOs have not included a basic definition of the types of services to be provided, their expected cost of use for the consumer and means of technical or other support for their effective use. Currently the available models and knowledge of the best mechanisms for achieving USOs is scarce in Africa and requires further study and information exchange.

A growing number of countries, such as Mauritius, South Africa, and Uganda, have adopted a mechanism known as a Universal Service Fund, to which telecom operators contribute a small percentage of their revenues (0.16 per cent in South Africa). The fund is then used to finance rural network infrastructure development. In other countries, such as Morocco, the telecom operator licence fees are used to finance rural telecom projects. Botswana has adopted another strategy in which the Government foots the bill for ensuring that rural villages have access to telecommunication services by contracting the telecom operator to build the necessary infrastructure.

3.1.1.3 Financing telecommunication infrastructure — restructuring, privatization and liberalization. State-owned telecom operators do not have sufficient resources to expand the network to anything close to desired levels or to provide the advanced services that are now being required. For many Governments direct revenues from the telecommunications sector are still an important part of the general revenue base and often one of the largest single contributors to gross national product (GNP). This usually means that public network operators are not free to reinvest their profits in network development. Another major problem for some operators in raising revenues is that government departments are usually the largest users of telecom services in the country but are often reluctant to pay their bills.

Furthermore, the pending reform of the accounting rate system, which currently channels a major portion of telecom revenues to African PTOs, and increased use of alternative

channels (principally call-back, by-pass, GMPCS, VSAT and Internet telephony) are expected to reduce some of the major sources of telecom investment capital. Finally, the lack of cross-border connections within Africa currently means that many intracontinental calls are routed via Europe or the United States, which costs African providers as much as $400 million a year in transit fees, according to the ITU's Telecommunication Development Bureau.

However, to obtain the level of financing required to meet current needs, the crucial role of private sector involvement in telecommunications infrastructure provision is being recognized, not only in Africa, but worldwide. This has coincided with technical developments that make telecommunication infrastructure more amenable to an open competition environment where it makes sense to have multiple competing networks.

The most common strategy that has been adopted in Africa is to commercialize the national operator and sell a share to a foreign strategic investor. Although Africa has lagged behind most other developing regions in embarking on this strategy, the last few years have seen a flurry of activity and significant private investment has been attracted to the continent (see Table 16). In many countries, laws have also been passed to allow joint ventures with the incumbent operator.

About three-quarters of the countries have taken the first steps in the process of separating postal functions from telecommunications and transforming the national operator into a nominally independent entity from Government.

Aside from the sale of a share in the operator to a strategic investor, a number of other options have been considered for raising capital, improving services and/or obtaining better access to human resources and technology transfer. These include:

- Initial Public Offer of shares to employees, to financial institutions and to the public.
- Revenue sharing — e.g. Build-Operate-Transfer (BOT) in which the operator contracts a private investor to install and operate the service initially, and they are rewarded by a share in the profits for the initial period.
- Management contract — introduction of private management expertise without any transfer of ownership.
- Joint venture in a limited area of service — e.g. many cellular networks and FCR's joint ventures in Internet service provision with some of the Francophone African PTOs (Tanzania and Madagascar).
- Sale of bonds to members of the public who are on the waiting list for a telephone.

The measures described above are intermediary steps in the process which is generally expected to lead to full competition in the sector. In some respects, monopolies have all but ended in most countries, due to the licensing of mobile operators, which have rapidly become competitors to the fixed network as alternate primary providers of voice telecom services. However as cellular/mobile tariffs are usually much higher than in the fixed networks they cannot yet provide low cost communications for the masses.

Table 16. Major PTO privatization revenues generated in Africa

Country	Year	Investor	Value (US$)	Share (%)
Cape Verde	95	Portugal Telecom, Public, Employees	20	40 44 5
Central African Republic	90	FCR		40
Guinea	95	Telecom Malaysia	45	60
Guinea Bissau	89	Portugal Telecom		51
Ghana	96	G-Com Consortium (Telecom Malaysia)	38	30
Côte d'Ivoire	97	FCR + local partners	210	51
Madagascar	95	FCR		34
Sao Tome	89	Portugal Telecom		51
South Africa	97	SBC of the US and Telecom Malaysia	1260	30
Senegal	97	FCR + local partners	112	33
Total			1685	

Source: ITU

There are a number of factors that indicate that policy-makers in Africa may develop their own special strategies in this regard. It can be seen that the rationale for continued monopoly operation to achieve universal service objectives in “unprofitable rural areas” emerged in a developed country environment (where telecommunication infrastructure costs were relatively high and where most of the population lived in densely populated urban areas, which could be serviced at relatively low cost in conjunction with high volume business users). In this environment, the universal service objective was needed to cover only the relatively greater costs of serving the small minority living in sparsely populated rural areas with voice services only.

These factors are not generally applicable in Africa today — network infrastructure roll-out and usage costs have already plummeted, and will continue to do so for the foreseeable future. This will be aided by the exploding quantities of fibre, wireless and satellite bandwidth that can make rural areas as easy to reach as urban ones. Also, convergence means that operators can use the same infrastructure to provide many more services than just voice calls to the end user. In addition, because of Africa's demographics, the great majority of the population and the bulk of demand for telecommunications will be in the rural areas, rather than the urban areas.

On top of all this, the Internet model of network development has emerged which allows anyone to build a part of the network and to be able to sell excess bandwidth and a wide variety of services to third parties in order to help cover the cost. The generally accepted view in the past has been that rural services in Africa would not generate sufficient revenue to be profitable. But with the cost-reducing factors described above, combined with the increase in types of service that can be supplied over the same infrastructure, this may no longer be the case.

3.1.1.4 Ensuring a level playing field — regulating the telecommunications sector. In the past, the PTOs or the relevant Ministry acted as both operator and regulator, but the introduction of competition and the growth in importance of the sector means that greater regulatory resources are required, as well as measures to limit the potential abuse of powers by the incumbent operator. Ensuring that the regulator is fully established and well prepared before further sector reform takes place has not been a feature of regulation on the continent so far.

One of the problems in ensuring the regulator has the necessary complement of skilled staff has been that the agency is usually part of the civil service. This means that they can only pay government salary rates, which are usually far below what a person of the calibre required can earn elsewhere, and must adhere to standard government hiring procedures.

Independence from direct government control is an important feature of a regulator, and this usually means that they must have financial autonomy (raising revenue through licences, fines and so on), and that the executive represents stakeholders and is not solely appointed by Government.

3.1.1.5 International collaboration. Because of the relatively small markets in Africa, international collaboration is seen as a key factor in increasing the economies of scale needed to reduce costs and to attract sufficient private sector investment. Similarly costs could be substantially reduced if countries can collaborate on establishing sub-regional hubs for their intercontinental and sub-regional traffic. Sub-regional collaboration between countries in the development of strong regulators and legislation is also an important means of addressing some of the infrastructural issues. The Conference of African Ministers of social and economic planning requested the UN Economic Commission for Africa to set up a High-Level Working Group to chart Africa's path onto the global information highways. An expert group was appointed by ECA to develop a framework document entitled the African Information Society Initiative, which was adopted by all of Africa's planning Ministers at the subsequent meeting of the Conference of African Ministers in May 1996.

Combined with the Abidjan African Regional Telecommunications Development Conference held the same year, as a regional initiative, AISI has created significant internally generated pressure from the responsible ministries to urge their administrations to adopt appropriate regulatory, tariff and service provision policies.

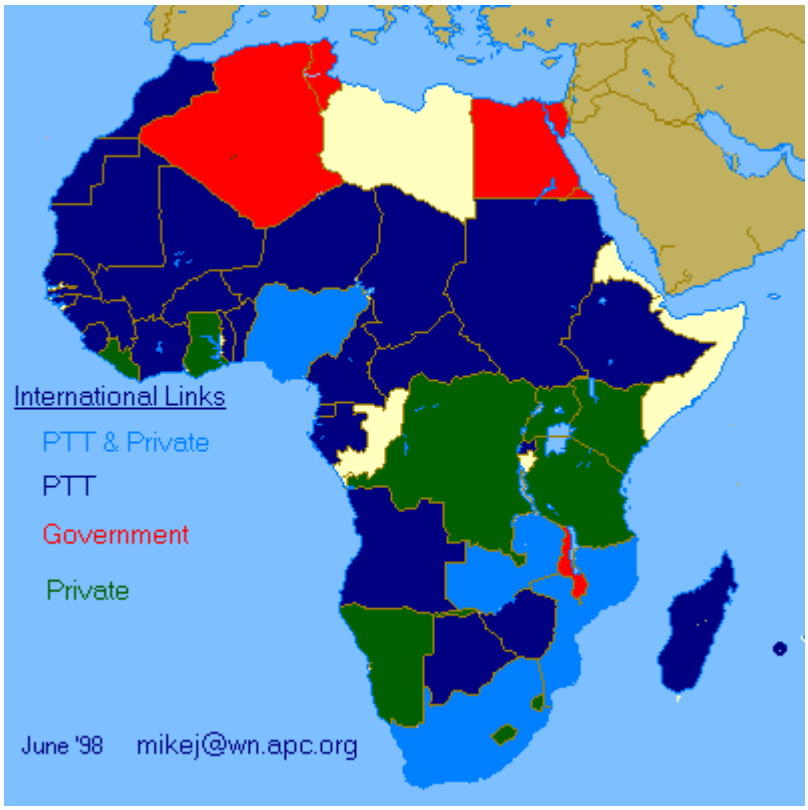
On a global level, only seven African countries, including Côte d'Ivoire, Ghana, Mauritius, Senegal and South Africa, have made commitments in the area of telecommunications as part of the general service falling under the WTO's General Agreement on Trade in Services. Related to this, the Co-ordinated African Programme of Assistance Services is aimed at assisting countries on trade in services to support national negotiating teams to develop strong and informed positions in the rounds of GATS negotiations.

Aside from this rather limited involvement in the WTO, there has been even less African participation in other global forums on information infrastructures. One of the other major problems that needs to be addressed is the lack of collaboration between the Anglophone and Francophone countries.

3.2 Broadcasting

While of more limited utility for e-commerce than the telecommunication networks, traditional radio and television broadcasts have a far higher level of penetration in Africa, and thus are likely to be an important part of some e-commerce strategies.

Map 2. International Link Operators



Source: M. Jensen

While there has been a notable shift toward licensing of commercial radio stations in Africa, in rural areas the content is usually limited to the one or two channels operated by the Government's national broadcaster. An increasing number of commercial stations are being established in the major cities following liberalization in many countries. However, the private sector has not shown much interest in assuming the higher costs and uncertain advertising revenues involved in setting up rural radio stations.

One strategy of note is support for community radio stations that incorporate multi-purpose community telecentres. This strategy is being tested in South Africa as a natural mix of services, which also increases the likelihood of achieving sustainability. In addition, increased use of the Internet by these stations is being encouraged as a low-cost means of obtaining audio clips for rebroadcast locally.

Table 17 . Radio stations broadcasting on the Internet

Angola — **Radio Ecclesia**	Morocco — **Medi1, Alkhbar**
Benin — **Golfe FM**	Senegal — **RTS, Nostalgie**
Egypt — **SIS**	South Africa **— Channel Africa**, **ClassicFM, 5 FM, Kaya FM, Metro, East Coast Radio**
Gambia — **Afrobeat**	Tanzania — **Radio One**
Ghana — **Joy FM**	Tunisia — **Radio Tunis**
Kenya — **KBC**	Uganda — **Radio Simba**
Madagascar — **Korail FM**	

Source: M. Jensen

The coverage pattern of national television is similar to radio but even more restricted, being largely confined to major towns. Some countries such as Côte d'Ivoire have made major strides in bringing television to rural areas, but again this is almost exclusively the domain of the national state-run broadcaster. For those who can afford subscription-based services, the opening up of broadcasting regulations has increased the availability of international microwave and satellite-based television programming.

In 1995 a private South African company launched the world's first digital direct-to-home (DTH) subscriber satellite service called DSTV, providing over 30 video channels and 40 audio programmes to the whole of Africa. Last year South Africa's public broadcaster, SABC, launched Channel Africa, a satellite-based news and entertainment channel aimed at the continent to compliment its existing short-wave radio service. In 1998 North Africa started receiving DTH TV broadcasts from Nilesat, the continent's first locally owned geostationary satellite, capable of broadcasting up to 72 digital TV programmes simultaneously. Operated by the country's national broadcaster, ERTU, Nilesat's coverage extends as far south as northern Chad, Eritrea, Ethiopia and Sudan, as well as to Morocco in the west.

The continent is also now covered by digital satellite broadcasts from the US-based startup company WorldSpace, which recently launched a satellite, focused on Africa. Broadcasters in Europe, and in Burkina Faso, Egypt, Kenya, Mali, South Africa and the United States have already signed up to provide content. A total of about 80 audio channels will be available to anyone on the continent who can afford about US$ 200 for the special digital radio required.

4. Computers and computing

Africa's level of computerization is very low, primarily because of the high cost of equipment relative to the low levels of economic development, and the lack of skills to make effective use of them. Although prices in Africa have decreased as markets have matured and greater competition has ensued, prices are still inflated as many import tax regimes still treat ICTs as luxury items, which makes these imported items all the more expensive, and thus even more unobtainable for the consumer. (See Table 18).

Although the very limited use of computers is readily apparent in Africa, accurate estimates of their penetration are notoriously hard to gather. Most recent estimates for the number of PCs in Africa put the average at about 3 per 1000 people in 1996, however some studies such as ACCT's 1995 survey indicates that this may be an overestimate by a factor of 3–6, making the average closer to less than 1 per 1000. Some of the wealthier countries such as Botswana, Mauritius and South Africa have significantly higher levels of penetration, at least 5 per 1000, perhaps up to 20 per 1000. Account also needs to be taken of the number of users sharing a single computer, which is much greater than in more developed regions.

With the great lack of resources in the public sector in Africa, the penetration of computers is generally much lower in Government, with by far the majority of PC equipment being used by private companies. Under-utilization of existing computer resources is also very common, caused by the preponderance of many stand-alone PCs in the same office with no use of Local Area Networks (LANs). Often an office may have many computers, but only one with a modem connecting to the Internet. This usually means that there is competition for the machine and a shared email account which is not conducive to effective use for e-commerce.

Table 18. Examples of Import Taxes for ICTs in Africa

Country	Tax Regime (VAT = Value Added Tax, or Local Sales Tax)
Senegal	26% duty import duty recently reduced to 5% for computers not made locally. 67% tax reduced to 55% for peripherals. Consumables — 15%. 25% duty for equipment made locally.
South Africa	6.5% import duty on computers, 15.4% duty on telecom equipment (cell/sat-phones). 14% sales tax
Tunisia	10% on computers and software
Morocco	15% on computers and software
Benin	18% VAT
Cameroon	10% on computers
Côte d'Ivoire	20% on computers
Burkina Faso	31% on computers, 56% on peripherals and 15% on services. 18% sales tax
Gabon	18% Sales Tax
Ghana	10% Import Tax
Mauritius	0% on computers, recently reduced duty on cell phones from 120% to 21% 10% Sales Tax. See http://ncb.intnet.mu/finance/custodep/dutyrate.htm
Malawi	30% Import duty
Mozambique	7.5% Import duty. 17% VAT
Nigeria	10% Import duty on ICTs
Uganda	2% Import duty, 4% withholding tax, 17% VAT
Tanzania	Import duty on computers reduced to 5% in Jul 1999. Duty for peripherals and communication equipment 20%. VAT 20%
Zimbabwe	15% Import duty, 15% Surtax, 15% VAT

Source: M. Jensen

Few of the international computer companies operate offices in Africa, but Bull, Compaq, IBM, NCR, Oracle and Microsoft have some form of local representation in most countries. Microsoft now has its own offices in Côte d'Ivoire, Kenya, Morocco and South Africa.

Although there are as yet few examples of the use of low-cost equipment such as Network Computers and set-top boxes, these have gained attention as a potentially important means of reducing costs and increasing the use of Internet in Africa. Similarly, a number of companies have emerged in the United Kingdom, United States and South Africa that supply low-cost refurbished PCs obtained from large companies upgrading their equipment.

5. The Internet and other advanced data services

As mentioned earlier, at the end of 1996 only 12 countries had local access, but by early 1999 only Congo (Brazzaville), Eritrea and Somalia were still without local Internet services and these countries are expected to be fully connected by the end of the year. The total number of computers permanently connected to the Internet in Africa (excluding South Africa) finally broke the 10 000 mark at the beginning of 1999. As measured by Network

Wizards, growth was up 36 per cent in the six months from July 1998 when there were only about 7 800 hosts, to 10 703 in January 99. The figure may actually be closer to 12 000 or 15 000 due to the measurement technique which cannot count hosts that are not properly reverse-referenced in domain name servers. Nevertheless, this still means Africa has about as many hosts on the Internet as Latvia, which has a population of only 2.5 million.

Figure 16. African Internet hosts

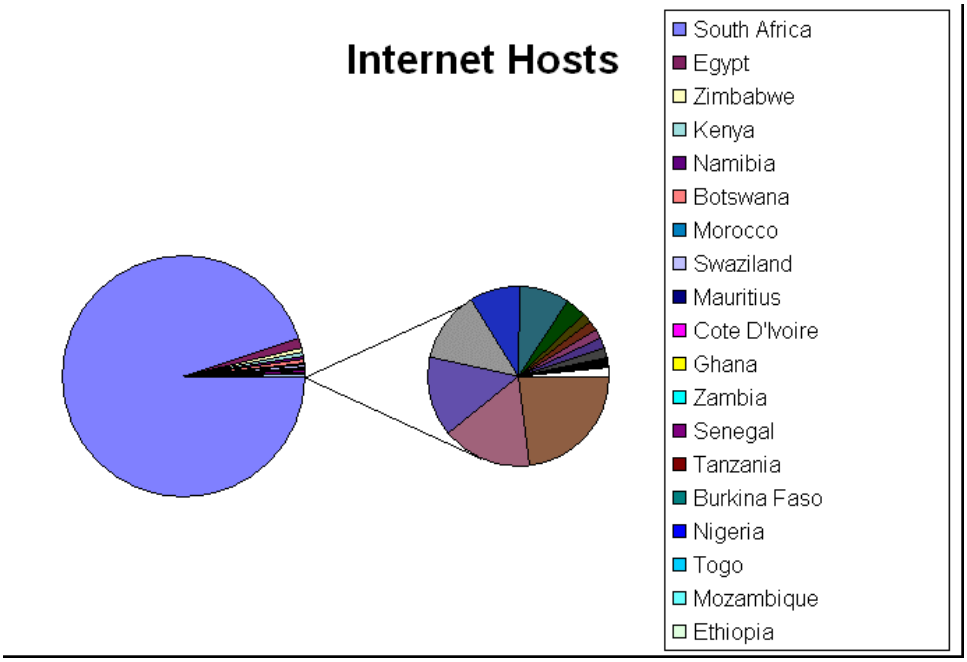
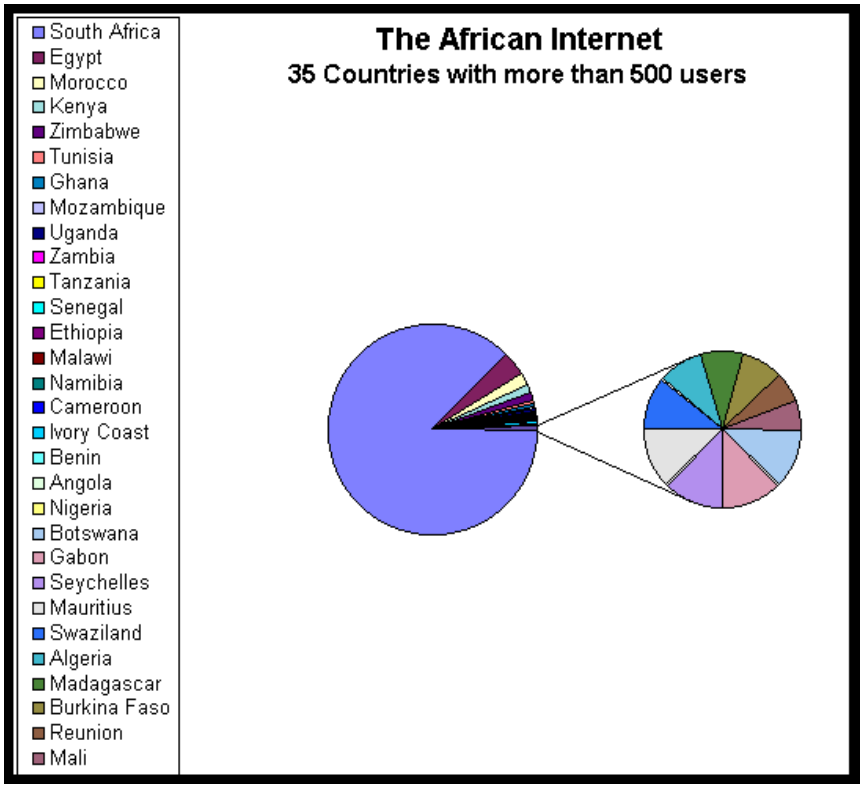


Figure 17. African Internet users



Source of figures 16 and 17: M. Jensen

However, the six-monthly African host growth rate is almost double the world average of 18 per cent for the same period, which could put the African figures at closer to 20 000 today. Also, the Network Wizards data does not take into account hosts registered under the .com/.int/.org generic top-level domains. The ITU has attempted to estimate the impact of this and put the total for January 99 at 20 000 hosts, so combining this with compensation for non-counting of wrongly configured domain-name servers (which ITU did not attempt to quantify), and with growth in the last 6 months could put the number of hosts at about 25 000. This represents about one host per 30 000 people, or 0.06 per cent of the world's 43 million hosts.

It is estimated that there are now over 500 000 subscribers in Africa. Each computer with an Internet or email connection supports an average of three users, a recent study by the UN Economic Commission for Africa has found. This puts current estimates of the number of African Internet users at somewhere around 1.5 million. Most of these are in South Africa (about 1 million) leaving only about 500 000 among the remaining 734 million people on the continent. This works out at about 1 Internet user for every 1500 people, compared to a world average of about 1 user for every 38 people, and a North American and European average of about 1 in every 4 people. (The UNDP World Development Report figures for other developing regions are: 1 in 125 for Latin America and the Caribbean, 1 in 200 for South East Asia & the Pacific, 1 in 250 for East Asia, 1 in 500 for the Arab States and 1 in 2500 for South Asia). No studies have been made in Africa of the number of rural vs urban users, but it is safe to say that users in the cities and towns vastly outnumber rural users. (See Table 19 for country comparisons).

There are now about 26 countries with 1000 or more dialup subscribers, but only about 10 countries with 5000 or more — Egypt, Morocco, Kenya, Ghana, Mozambique, Senegal, South Africa, Tunisia, Uganda and Zimbabwe.

One of the major reasons for the low numbers of users is that Internet access in Africa is largely confined to the capitals and major towns. The exception to this is where, in some countries, the PTOs established local call Internet access across the whole country. With the massively reduced costs for those in remote areas that this provides, it is surprising that so far only 13 of the 53 countries have adopted this strategy — Burkina Faso, Chad, Ethiopia, Gabon, Malawi, Mali, Mauritius, Mauritania, Niger, Senegal, Togo, Tunisia and Zimbabwe.

Aside from the problem of the majority of potential users being a long distance call to the major urban centres where ISPs are located, even when it is a local call to an Internet POP server, local call tariffs are the biggest barrier for small organizations, poorly resourced public institutions and anyone outside the upper income bracket. In the many countries where local calls cost upwards of US$ 4 an hour (in some countries it is as high as US$ 10/hr), and for anyone dialling long distance, usage is usually restricted to email, if at all.

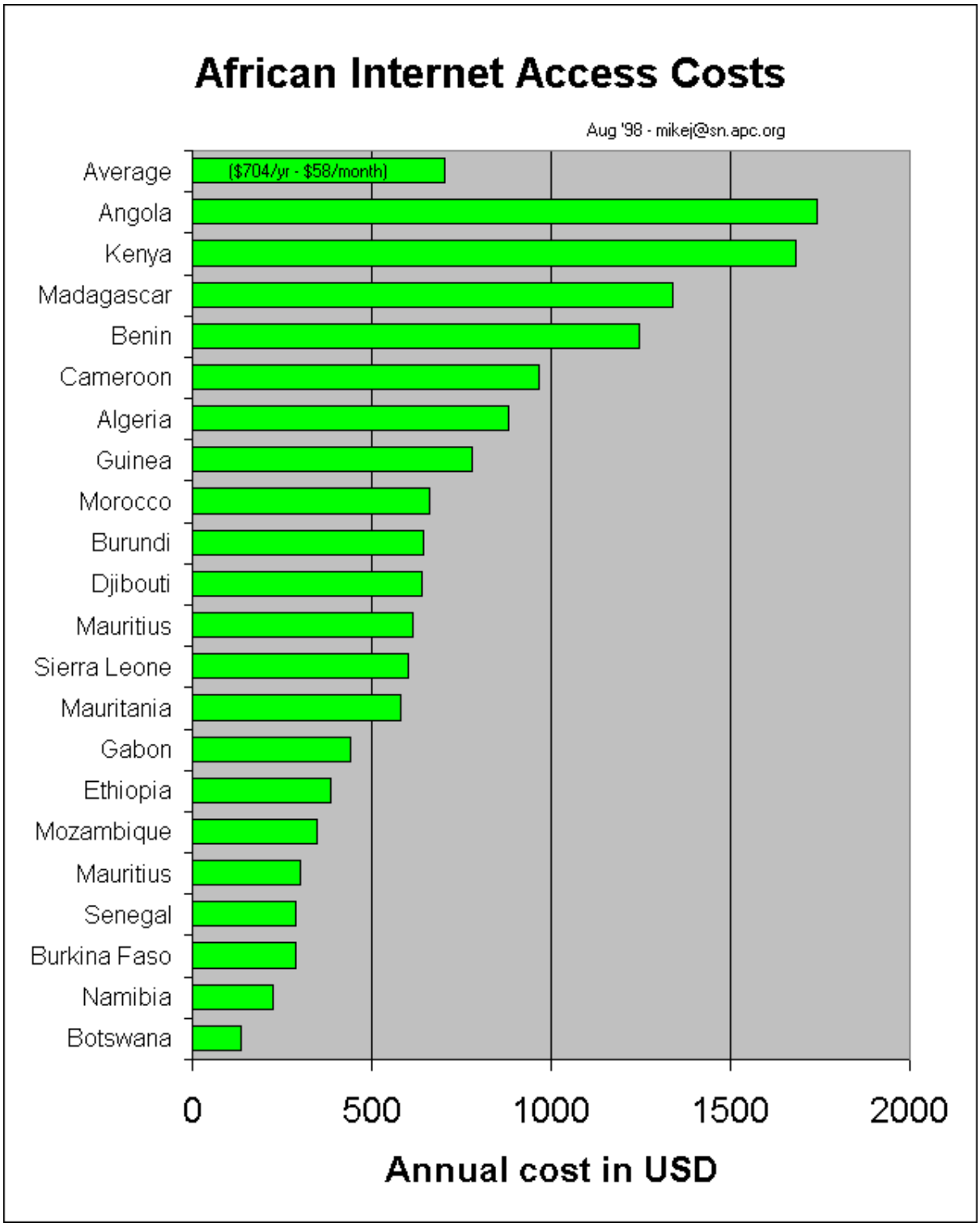
While call charges are the major problem, Internet service provider subscription fees are also a contributing barrier to access. Currently, the average total cost of using a local dialup Internet account for 5 hours a month in Africa is about US$ 60/month (usage fees, telephone time included, but not telephone line rental), which is substantially higher, for example, than comparable charges in OECD countries.

Table 19. African Internet populations

Country	ISPs	Internet accounts	Internat. bandwidth (Kbps)	ISP mono-poly	Call cost (US$/hr)	1998 Population (1000s)	Population / Internet User	96 GDP /Person	Users / Kbps Internat
Algeria	3	750	64	Yes		30175	40,233	1531	12
Angola	5	4,000	192	No	6.00	11967	2,992	355	21
Benin	7	2,000	128	Yes	4.80	5881	2,941	391	16
Botswana	6	3,400	768	No	0.60	1551	456	3640	4
Burkina Faso	3	2,500	256	No	1.10	11402	4,561	165	10
Burundi	1	150	19	?	0.75	6589	43,927	205	8
Cameroon	4	2,000	256	No	1.55	14323	7,162	627	8
Cap Verde	1	1,400	512	Yes		417	298	994	3
Central Afr. Republic	1	200	64	Yes	6.90	3489	17,445	379	3
Chad	3	300	64	Yes	10.50	6892	22,973	187	5
Comoros	1	200	64	?	0.20	672	3,360	367	3
Congo	0	0	0	?		2822			
Côte d'Ivoire	3	3,000	256	No	4.80	1135	378	131	12
Djibouti	1	300	64	Yes	1.00	651	2,170	893	5
DRC	1	500	64	No		49208	98,416		8
Egypt	40	100,000	4096	No	1.20	65675	657	973	24
Equatorial Guinea	1	200	64	Yes		430	2,150	388	3
Eritrea	4	300	29	N/A	0.60	3548	11,827	96	10
Ethiopia	4	2,500	512	Yes	2.60	62111	24,844	96	5
Gabon	2	1,000	512	No	13.90	1171	1,171	5007	2
Gambia	4	150	128	No	1.20	1194	7,960	321	1
Ghana	9	5,000	640	No	1.34	18857	3,771	397	8
Guinea	5	300	128	No	2.00	14567	48,557	736	2
Guinea Bissau	1	150	64	Yes		7673	51,153	442	2
Kenya	16	15,000	4000	No	1.36	29020	1,935	330	4
Lesotho	1	200	512	No		2184	10,920	486	0
Liberia	1	75	64	?		2748	36,640	1124	1
Libya	0	0	2048	?		5980			
Madagascar	5	1,500	2556	No	0.43	16348	10,899	215	1
Malawi	3	2,400	128	No	1.56	10377	4,324	142	19
Mali	5	1,000	128	No	2.80	11831	11,831	223	8
Mauritania	2	100	128	No	6.60	2454	24,540	401	1
Mauritius	6	13,000	4096	Yes	1.00	1154	89	3508	3
Morocco	17	40,000	8192	No	0.85	28012	700	1265	5
Mozambique	6	5,000	512	No	0.80	18691	3,738	77	10
Namibia	6	3,000	1536	No	1.00	1653	551	2059	2
Niger	2	300	192	Yes	1.31	10119	33,730	207	2
Nigeria	15	3,000	1152	No	0.40	121773	40,591	587	3
Reunion	1	500	576	?		682		1364	1
Rwanda	1	100	128	Yes		6527	65,270	238	1
Senegal	9	2,500	1024	No	1.90	9001	3,600	572	2
Seychelles	1	1,000	128	?		76	76	7272	8
Sierra Leone	3	150	128	No	1.50	4576	30,507	293	1
Somalia	0	0	0	?		10653			
South Africa	120	330,000	90000	No	1.60	44296	134	3230	4
Sudan	1	300	128	?		28527	95,090	36	2
Swaziland	3	900	256	No	0.95	932	1,036	1389	4
Tanzania	14	2,500	2048	No	1.94	32189	12,876	139	1
Togo	8	1,700	384	No		4434	2,608	322	4
Tunisia	4	16,000	7020	No		9497	594	2030	2
Uganda	4	12,000	384	No	8.40	21318	1,777	305	31
Western Sahara	0					273			
Zambia	3	3,000	256	No	1.60	8690	2,897	382	12
Zimbabwe	17	10,000	2048	No	4.00	11924	1,192	786	5
Total	367	555525	130504	-	2.0	750327	1,351	959	6.2

Source: M. Jensen

Figure 18. African Internet access costs



Source: M. Jensen

Most African capitals now have more than one ISP and in early 1999 there were over 300 public ISPs across the region. Countries with larger numbers of ISPs generally have lower Internet charges and in general it has been observed that prices have dropped and service quality has improved whenever competition has been introduced into the market. Roaming dialup Internet access is now a reality for travellers to most African countries, courtesy of SITA, the airline cooperative, which has by far the largest network in Africa.

Because of the high cost of full Internet services, the slow speed of the web and the overriding importance of electronic mail, lower-cost email-only services have been launched by many ISPs and are continuing to attract subscribers. Similarly, because of the relatively high cost of local electronic mailbox and web services from African ISPs, a large proportion of African email users make use of the free web-based services such as Hotmail, Yahoo or Excite, most of which are in the United States. But these services can be more costly in telephone time and more cumbersome than using standard email software, because extra online time is needed to maintain the connection to the remote site.

There is also a rapidly growing interest in kiosks, cybercafes and other forms of public Internet access usually called telecentres, which are adding PCs to community phone-shops, schools, police stations and clinics. The concept has received considerable support from the ITU and other members of the international community, as well as a number of national Governments and public telecom operators. The telecentre approach may be one of the most important means of providing access to advanced services in rural areas, but needs further study and awareness raising to determine the most appropriate models.

Table 20. Public drop-in Internet access — telecentres and Internet cafes (incomplete)

- Algeria — Algiers
- Botswana — Gabarone
- Cameroun — Younde
- Egypt — Alexandria, Assiut, Cairo, Garden City, Mohandeseen, Zagazig, 10th of Ramadan City,
- Ghana — Accra
- Kenya — Eldoret, Kakamega, Kisumu (3), Litein, Nairobi (40+), Machakos (2), Meru, Mombasa (4), Thika.
- Madagascar — Antananarivo (2)
- Malawi — Lilongwe, Livingstonia
- Mali — Bamako
- Mauritania — Nouakchott
- Mauritius — Curepipe
- Morocco — Agadir, La Victoire, Marrakesh, Rabat, Settat, Tangier, Tetouan, Casablanca
- Nigeria — Abuja, Lagos
- Senegal — Dakar, Saly, Ziginchor
- South Africa — Batlokwa, Bulwer, Cape Town, Durban, East London, Flagstaff/Holy Cross, Gasaleka, Johannesburg (10+), Ndevana, Thaba Nchu, Tongaat. Total: 50
- Swaziland — Mbabane
- Uganda — Hoima, Kampala, Mbale, Nakaseke
- Tanzania — Arusha, Dar es Salaam (5), Mbeya, Morogoro
- Tunisia — Binzerte, Carthage, Gafsa, Kairouan, Kasserine, Kebili, Kef, Mednine, Nabeul, Sfax, Sousse, Tunis, Zaghouan (13)
- Togo — Lome
- Zambia — Chipata, Lusaka, Livingstone
- Zimbabwe — Harare (5), Gweru

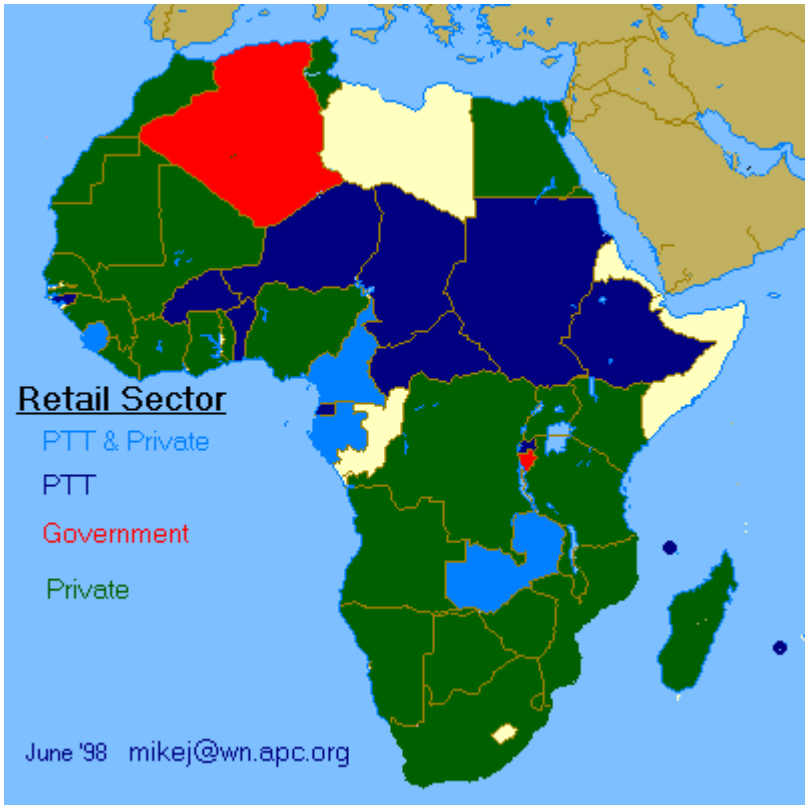
Source: M. Jensen

The rapidity with which most African public telecom operators have moved into the Internet services market is also noteworthy. Because of their larger economies of scale and spread of their network, PTOs can have a considerable influence on the cost and availability of Internet services.

In the last three years, PTOs have brought Internet services on stream in 31 countries and similar moves are afoot in four others (Liberia, Somalia, Tanzania and Uganda). However, even where cost-based tariffing has been implemented, such as in Mozambique, Internet access to the national hub and upstream link costs are still 8–12 times more expensive than the equivalent link in the United States.

Usually the PTOs operate the international gateway or access to the national backbone, and leave the resale of end-user Internet access to the private sector (see Table 20). In a few countries the PTO operates an international gateway in competition with the private sector.

Map 3: Retail Sector



Source: M. Jensen

Table 21. The major types of Internet market structures in Africa

Country	Structure	Issues, Pros/Cons
Tanzania	Three licensed international public carriers (wholesalers), open market in local resellers.	High price of international licenses levied by the regulator reflects high charges made to downstream ISPs and thus to end-users. Heavy license fees being considered for ISPs.
South Africa	Competition between the PTO and private ISPs in the international wholesale and retail markets. ISPs currently not subject to licensing but is a grey area as they are in theory VANS.	PTO dominance means absence of a level playing field for competition. PTO may try to have Internet services declared a basic service, subject to its monopoly.
Mauritius, Ethiopia	Monopoly international and retail service provided only by the PTO.	No competition means high prices and no incentive to improve service quality
Senegal, Mauritania, Botswana, Morocco, Tunisia	Monopoly in wholesale/ international service by PTO or government agency, free competition in retail/local services.	Lack of competition in international/wholesale market may keep prices high and make it difficult for local ISPs to differentiate themselves and provide different levels of service quality.
Egypt	No involvement of PTO, government agency (IDSC) competes with private sector for international bandwidth provision, open market in retail sector.	No major problems with this model, depends on capacity of Government to manage the service.
Mozambique	PTO competes with private sector in provision of international bandwidth. Open competition in retail sector with no involvement of PTO	No major problems with this model.
Congo	Joint venture between PTO and commercial ISP	Novel approach, good for initial Internet service in a country.
Algeria, Malawi, Tunisia	Government-authorized sole agency — CERIST, MalawiNet, ATI,	Economies of scale but usual deficiencies in service quality and high tariffs are associated with this model.

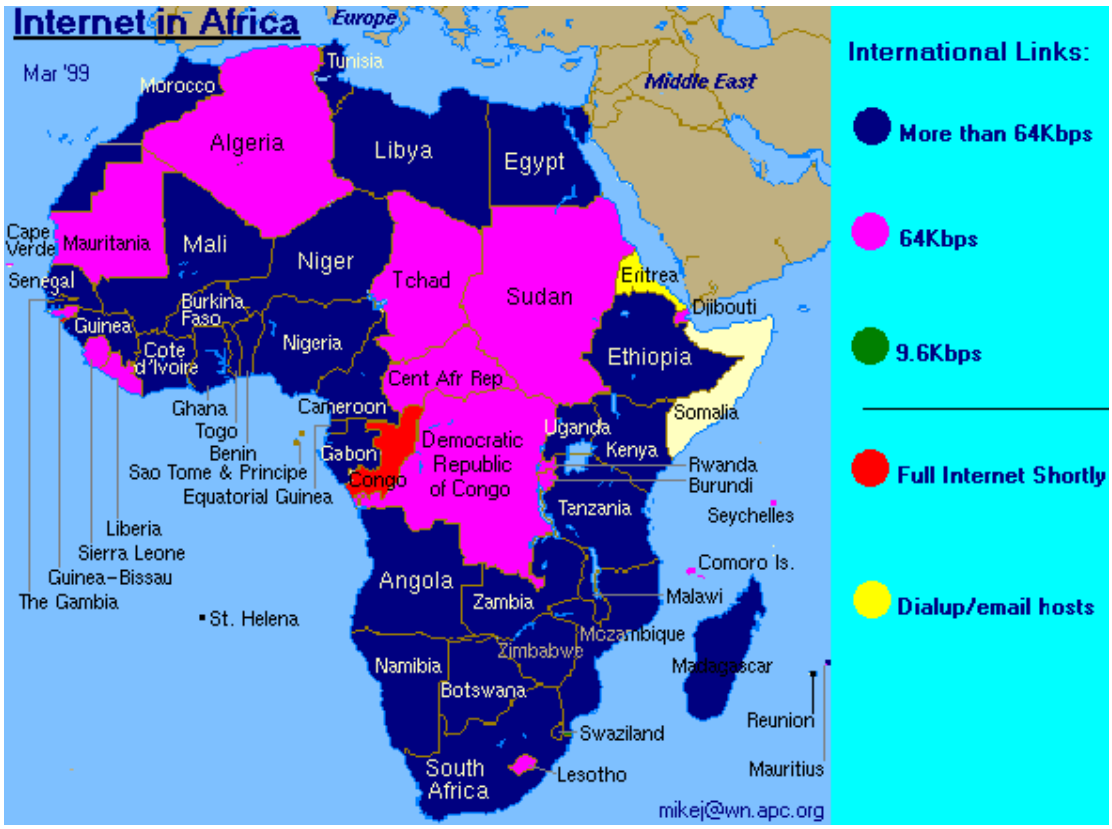
Source: M. Jensen

Due to high international tariffs and lack of circuit capacity, obtaining sufficient international bandwidth for delivering web pages over the Internet is still a major problem in most countries. Excluding South Africa, the total international outgoing Internet bandwidth installed in Africa is about 50Mbps (see Map 4). However this means that on average about 5 dialup users must share each 1Kbps of international bandwidth, making for slow connections to remote sites.

As a result a growing number of African Internet sites are hosted on servers that are in Europe or the United States. This is especially necessary for countries where ISPs operate their own independent international links without local interconnections (peering), such as in Kenya and Tanzania, which means that traffic between the subscribers of two ISPs in the same city must travel to the United States or Europe and back. This makes it more efficient to host outside the country, and is also being encouraged because web hosting costs can be

relatively high in Africa, while there are many free hosting sites in the United States and Europe.

Map 4: International bandwidth in Africa



Source: M. Jensen

The use of two-way satellite-based Internet services using very small aperture terminals to connect directly with the United States or Europe is usually the cheapest way for ISPs in countries outside South Africa to connect to the Internet. As a result, these have been quickly adopted wherever regulations allow. This is permitted or cost-effective in very few countries, namely Ghana, Mozambique, Tanzania, Uganda and Zambia, which all have ISPs that are not dependent on the local telecom operator for their international Internet bandwidth. While the use of VSATs may be permitted, many telecom operators ensure that high licence fees makes it as expensive as using PTO infrastructure.

The main reason for this is that the high international tariffs charged by telecom operators discourage Internet service providers from establishing multiple international links. As a result ISPs are forced to consolidate all of their traffic over a single high cost international circuit. This means that significant and rapidly increasing capital outflows from the region are occurring for Internet traffic between African countries which is paid to United States or European service providers. In addition, and perhaps of more immediate significance for e-commerce, the lack of multiple links means that reliability is compromised as there is no alternate route on the occasions when the only international link goes down, as happened in Kenya recently.

Furthermore, ISPs must foot the entire cost of the connection to Europe or the United States, which effectively gives the ISPs in developed countries free access to the continent's network and further increases the costs that ISPs in Africa must bear. In contrast to the Asian forum of telecom operators and regulators, which has opposed this same imbalance in Asia and made representations to the United States FCC in this regard, African providers have not yet formed a lobby group to add their voice to this growing issue.

Table 22. Some indicators of internet sophistication in various African countries

Countries with ISDN Services		
Egypt	Morocco	South Africa
Mauritius	Seychelles	Tunisia
Countries with the public telephone directory online		
Mali — Sotelma		
Countries with Web Cams		
Nigeria (1)		
South Africa (19)		
Airports with public Internet access		
Kenya — Jomo Kenyatta International, Nairobi		
Zimbabwe — Harare International		
Hotel/Accommodation with drop-in Internet Access		
Egypt — Cairo Airport Movenpick		
Kenya — Nairobi Hilton, Intercontinental		
South Africa — Johannesburg: Rosebank Courtyard Hotel, Cape Town: Eastgate Courtyard Hotel.		
Zimbabwe —Meikles Hotel, Harare		
Hotels with internal Internet servers (dial an extension to get IP)		
Egypt — Cairo Airport Movenpick		
South Africa — Sandown/Sandton City Lodge		
Hotels with ISDN access in every room		
South Africa — Cape Town (The Bay)		

Source: M. Jensen

Internet governance issues have generally fallen outside the ambit of national policy makers in Africa, largely because of the history of the Internet as a self-governing entity. However as the importance of the Internet has grown, various global Internet policy-making initiatives have emerged. So far Africa has had little involvement in these activities but ISPs are increasingly realizing that it is important that the region becomes more involved and develops effective representation structures to ensure that it has a say in global Internet governance issues.

There have been discussions and disputes over domain name management, which have been resolved with varying levels of success. While a number of PTOs and Governments

have assumed that they have the right to manage the domain for their country, the top-level domain name manager — IANA — has generally upheld the right of the first local registrant to manage the domain as long as there are no substantive complaints about the quality of management.

Of greater concern perhaps are domain name-registering companies based in the United States and Europe such as NetNames, which have colluded with the local registrant to sell domain addresses to multinational corporations in the name of guarding their brand name or trademark domain as intellectual property. For example Estée Lauder and Levi's Jeans, among many other companies, have been persuaded to register their domains in countries where they have no real presence, such as Libya and Malawi. This activity has effectively corrupted the true value of the domain address as an indication of location.

Another important area of Internet governance that is now beginning to emerge in Africa is Internet machine numbering (IP address allocation). This is currently being managed on Africa's behalf by US and European bodies. A regional body is in the process of being formed called AfriNIC.

In the area of Internet content development, the African web space is expanding rapidly and almost all countries have some form of local or internationally hosted web server, unofficially or officially representing the country with varying degrees of comprehensiveness. However, there are still generally few institutions that are using the web to deliver significant quantities of information. While increasing numbers of organizations have a web site with basic descriptive and contact information, many are hosted by international development agency sites, and very few actually use the web for their activities.

Chapter 4. An agenda for action

Previous chapters have focused mainly on the diagnosis part of the e-commerce debate. After discussing the scope, definition, possible impact, sectoral and cross-sectoral components of e-commerce as well as its current state in developing countries, it is now time to turn to the operational side of the "e-commerce and development" issue: what is being done to involve developing countries in electronic commerce; and what needs to be done to ensure that e-commerce fully plays its role as a contributor to the development process and as a tool against creation of a North-South digital divide?

Whether at the national, regional or multilateral level, actions undertaken, initiated or foreseen have in one way or another to address the three priority areas identified earlier as necessary conditions to the full participation of developing countries and their enterprises in global e-commerce, namely:

- Access
- Know-how
- Trust

In these three areas, the experiences of individual countries, both developed and developing, already constitute a significant body of knowledge: the national strategies designed and implemented at the national level should therefore be assessed as a possible basis for action by national Governments. Some of these approaches, as well as some regional cooperation efforts will be described in Section I of this chapter. However, due attention also needs to be devoted to the efforts already underway or being considered at the multilateral level, which will be the objective of Section II. The chapter will conclude on an "agenda for action" reflecting the main conclusions which have emerged from UNCTAD's series of workshops and roundtables on "Electronic commerce and development".

Section I — Action at the national and regional levels

Even in those countries where the private sector and the free interplay of market forces are seen as the main engines for the healthy development of electronic commerce, Governments have undertaken significant efforts to enhance national awareness about the details, potential effects and requirements of this type of economic activity. In most of the countries where such efforts have proved successful, two main elements seem to have been central to the efforts carried out: (a) all major relevant ministries, administrations and sectoral

interests likely to be affected by electronic commerce were involved; and (b) a clear, visible and respected leadership provided vision and guidance to such efforts. Whether they were a high-level government official or a respected leader from the private sector, the leaders of successful "e-commerce national task forces" were somehow above the specific interest of one ministry, one administration or even one sector of interest; they also proved to be individuals interested in new technological developments without being seen as technicians, technocrats or "geeks". Their goals could often be described as social, economic or even geo-political, but seldom as *technicist* ones. Although there is no proven and infallible recipe for success in this area, the ability to place the objectives of national efforts to promote an "e-commerce culture" above sectoral interests and established practices and habits seems to have been a positive contributor to the success of some of the first "e-commerce enabled" countries.

In several instances, regional co-operation has been identified as a possible way for smaller countries (especially developing countries) to consolidate their national efforts, and to benefit from a broader reservoir of experience. Some of these experiences, national and regional are described below.[114]

National task forces and advisory committees in advanced countries

National task forces and coordination efforts have sometimes been built around an individual with high-level and direct political support (Ira Magaziner in the United States, Francis Lorentz in France) or around a specific institutional mechanism (Canada). Some of them have even been designed as "national think-tanks" involving many foreign advisors, such as in Ireland. These two last examples are described in greater detail below.

Canada

In the area of e-commerce, Canada has been pursuing a strategy that is based on private and public sector partnerships. The private sector is to provide the lead role in the development and use of e-commerce, while the Government is to support the private sector by (i) providing a supportive and responsive domestic policy environment for e-commerce; (ii) working with other Governments and international organizations to establish a global regime that provides consistent and predictable global rules, and ensures the interconnection and interoperability of the information infrastructure; and (iii) to show leadership by acting as a model user of new technologies, serving to demonstrate the advantages of e-commerce and building trust among businesses and consumers.

In its strategy, the Government has identified four main priorities:

(i) building trust in the digital economy through ensuring security in transactions and providing protection of personal information and consumer protection;

(ii) developing a body of rules that govern how business and government transactions are conducted;

(iii) developing a strong information infrastructure, including network access, availability and open standards; and

[114] Many of these national experiences come directly from presentations made during the series of workshops and roundtables mentioned earlier.

(iv) the development of skills and awareness about opportunities created by e-commerce and the Government providing leadership as a model user.

An Electronic Commerce Summit was held in April 1998 at which business, consumers and Government agreed to adopt the above-stated objectives and priorities on e-commerce. As part of its strategy, Canada has provided international leadership and participated with international organizations in the development of electronic commerce frameworks. In 1998 it hosted the OECD Ministerial Conference on Electronic Commerce. In addition, it has participated actively in various international events aimed at the promotion of the growth of e-commerce. This has included work in Asia Pacific Economic Cooperation, WTO, Free Trade Agreement of the Americas (FTAA) and a G-8 Pilot Project "A Global Market for SMEs". It has also worked actively in other specialized international organizations where products such as model laws for electronic commerce and standardization frameworks are being developed. It has also pushed the case for Governments to act as model users of e-commerce, for example in WTO and NAFTA.

At the domestic level, Canada has taken a number of specific measures. In the area of security, in 1998 it released a cryptography discussion paper and the country's cryptography policy has been reviewed to ensure that it contributes to the country's objective to be a leader in e-commerce.

Also in 1998, private sector information-privacy legislation was initiated in order to protect consumer rights to have personal information, while at the same time enabling industry's interest in compiling and using personal information. The Government has also been encouraging the development of such technologies as cryptography, firewalls and screening devices in order to enhance privacy. It has also taken measures to educate the public about privacy issues.

A Working Group on Consumers and Electronic Commerce, composed of consumers, business associations and Governments has worked on guidelines on consumer protection in electronic commerce. The Government has also been considering how existing legislation on consumer protection can address consumer protection in e-commerce.

To address issues raised by paperless transactions, Canada has established electronic document legislation that allows departments to adopt a set of general provisions authorizing the use of electronic communications. Some existing laws, which assume the existence of paper documents, are being amended to accommodate e-commerce. The Government has also been engaged in a variety of other e-commerce related issues, such as: carrying out a study on Internet content-related liability; issuing a report entitled "Electronic Commerce and Canada's Tax Administration"; submitting proposals to WTO on customs duties in e-commerce; reviewing national Intellectual Property legislation in order to adapt it to international obligations; reforming Canadian domain-name systems; and producing guidelines for owners of property rights to make them understand how those rights may be affected by the enforcement of the Canadian Competition Act.

As regards information infrastructure, the Canadian Government has adopted a policy of market liberalization as an incentive for investment and innovation. It has also supported research networks and Internet access for institutions and communities.

Finally, to play a role in demonstrating the advantages of e-commerce, a range of projects have been initiated in the procurement of goods and services and the provision of government services through electronic means.

Ireland

In 1998, Ireland adopted a strategy to position itself as a key global centre in advanced telecommunications, the Internet and electronic commerce. In this connection, the Irish Government established an Advisory Committee on Telecommunications with responsibility of advising the Government on the stated strategy. A speciality of this committee is that it includes a majority of foreign specialists and experts, from private and public organizations.

The Committee recommended to the Government the adoption of the objective to reinforce its commitment to: rapidly establish an effective, liberalized telecommunications market; to encourage global telecommunications and Internet operators; to locate in Ireland and to actively pursue the positioning of Ireland as a global leader in electronic commerce.

To achieve the above objective, the Committee made recommendations on actions in four areas — telecommunications competition, Internet access and connectivity, electronic commerce, citizens' access and human resources.

The Committee recommended, in particular, giving high priority to: creating a competitive, market-driven telecommunications sector, establishing low-cost Internet access, developing broadband access on a national basis, and developing Internet-capable connectivity to the major business centres. It also recommended: the possible introduction of an accreditation system for firms engaged in e-commerce from an Irish base in order to ensure security and trust; to undertake an electronic commerce policy initiative, utilizing benchmarking of electronic commerce readiness; the government taking leadership in the deployment of e-commerce by establishing websites to provide electronic access for publications, forms, and so on; and establishing projects on government–business communications.

Finally, it recommended the promotion of an entrepreneurial culture, a full examination of needs for skills in new types of e-commerce activity and strengthening the focus on computer literacy and Internet skills within the education system.

Selected examples of e-commerce activities in developing countries

Many developing countries have taken various initiatives to promote the growth of e-commerce in their countries. Some interesting examples can be found in Venezuela, Tunisia, Peru, Sri Lanka and South Africa.

Venezuela

Under the joint leadership of public officials and private entrepreneurs, Venezuela has seen the creation of a remarkable and original entity known as the Venzuelian Chamber of Electronic Commerce (Camara Venezolana de Comercio Electronico[115], or CAVECOM-e for short). This independent body has several priorities and areas of activity, including: (a) promoting of e-commerce activities by Venezuelan enterprises, at home and abroad, (b) establishing electronic commerce as a well-recognized sector of economic activity, in Venezuela and abroad, (c) contributing to improving the local legal and normative frameworks in order to enhance the development of e-commerce, (d) strengthening research, development and training related to e-commerce, and (e) being an interlocutor for private and public players involved in e-commerce, nationally and internationally, and participating in relevant discussions with such players.

[115] See: http://cavecom-e.org.ve

Among the activities already undertaken by the Venezuelan Chamber of Electronic Commerce, some have already generated tangible results, such as sensitization seminars and workshops, the publication of a book on “Electronic Commerce: legal frontiers”[116], and, through the Venezuelan Federation of Chambers of Commerce (Fedecámaras), the active promotion of practical tools such as the Venezuelan Electronic Invoice.

Tunisia

As early as November 1997, the Tunisian Government set up a National Commission for Electronic Commerce and EDI. Made up of several working groups, the Commission was given the task of establishing an electronic commerce strategy and infrastructure development programmes. The working groups study the various aspects of electronic commerce (legal, commercial, financial, security and so on). Two reports that include the Commission's recommendations were submitted to the Government in March 1998 and in November 1998.

The recommendations were discussed during a cabinet meeting held in mid-May 1999, which announced major decisions aimed at boosting electronic commerce in Tunisia. They include:

- revision of procedures connected with foreign trade, with a view to boosting exports via the Internet network and facilitating the action of electronic commerce operators;
- launching pilot projects that will open virtual shopping centres to export tourist products, craft work, certain finished products and agricultural and industrial goods;
- implementing a "strategy of awareness and training", via periodic seminars and study days on electronic commerce;
- further developing the national communications network with a view to adapting it to the demands of electronic exchange as regards to speed of data transmission, while simultaneously working to develop transport and express mail services;
- putting the finishing touches to the legal framework regulating this activity so that Tunisian law will be in tune with new modes of commercial transaction, particularly as regards to legalization of the electronic means of identification (digital signature and certification) and trusted third parties;
- creation of a permanent ministerial committee, supported by a technical commission of experts and specialists, to guarantee permanent follow-up of these recommendations and ensure co-ordination among all stakeholders.

Six pilot projects were launched and put in operation in May 1999. They are a set of virtual stores offering a wide range of Tunisian products, such as crafts, goods, clothing, foodstuffs, tourism packages and hotel reservations. These stores are accessible through the website "Tunisia E-Shopping Center"[117] which has a secure credit card ordering facility using the VeriSign system.

EDI projects are being studied in various sectors such as banking, textiles and telecommunications. One of the EDI main projects is the "Single Batch" project aimed at

[116] "Comercio electrónico: fronteras de la ley " , Cavecom-e ed., Caracas, 1999.

[117] See : http://www.ecom.tn.

facilitating foreign trade procedures by setting up an EDI Server centre to allow various agents (trade organizations, customs, banks and forwarders) to exchange foreign trade operations documents. A web /EDI interface is aimed at permitting importers, exporters and forwarders to carry out foreign commerce operations via the Internet without needing expertise in EDI. This project is expected to be operational by March 2000. The National commission has also recently prepared a first Draft for an "E-commerce and Digital Signature" law and submitted it to the Government.

An awareness campaign entitled "Internet Caravans '99" started in September 1999. It will visit all Tunisian *gouvernorats*. Each visit includes a one-day program with Internet and Electronic Commerce seminars and workshops.[118]

Peru

Created under the auspices of Prompex (Peruvian Commission for the Promotion of Exports),[119] the Peruvian Institute for Electronic Commerce (Instituto Peruano de Comercio Electronico, IPCE)[120] has been created to fulfil a large array of functions, including:

- to be a counterpart in national and international projects, to co-ordinate with international bodies and similar competent entities, and to co-ordinate domestic and international initiatives and investments;
- to play a leading role in the suggestions for legal and regulatory adaptation, and to make recommendations about the adaptation of the Domestic Legal System. In this context, IPCE will suggest actions for the suppression of legal barriers for traditional commerce. To do so it will identify and suggest the dismantling of existing legal and regulatory obstacles and will be ready to:
  - — prevent and correct the creation of new barriers to electronic commerce developments;
  - — provide solutions for adapting the national rules for accounting and auditing to e-commerce;
  - — promote the ideas that (a) commercial laws should uphold the commerce practiced through electronic networks and that (b) Governments should adopt non-regulatory policies for e-commerce, recommending mediation in cases of conflict; promoting the creation of a Peruvian Cyber tribunal; making recommendations and coordinating with the relevant public entities in order to strengthen the Electronic Data Interchange;
- to spread electronic marketing strategies, and contribute to the promotion and facilitation of electronic marketing and interactive marketing strategies, such as virtual fairs and business rounds;
- to establish and create mechanisms aimed at national enterprises under the concept of "always open"; to promote the application of initiatives based on business experience; and to build selected partnerships with business partners to obtain successful results in national sales;

[118] A website (http://www.caravanes-internet.tn) gives information and "real time" news of the caravans.

[119] See: http://www.prompex.gob.pe.

[120] See: http://www.prompex.gob.pe/ipce.htm.

- to promote Internet-based transactions, to encourage electronic transactions, to take actions focused on technical interoperability and mutual acknowledgement of transactions beyond borders, to establish and create mechanisms for identity control and solvency of the economic actors involved in digital economic transactions;
- to promote intermediation changes, including actions focused on the presence and reinforcement of national cyber-intermediaries and Peruvian electronic brokers, to study and analyse the establishment in the country of virtual intermediaries that offer added-value services (brokerage, partner-seeking, and so on);
- to promote e-commerce solutions; to recommend existing standards and co-ordinate their international participation in modifications or innovations towards standardization; to develop e-commerce software solutions; to experiment selectively with new interactive technologies;
- to spread knowledge, to propagate the use of reliable technologies (signatures, digital certificates, mechanisms for electronic payment, insurance), to train electronic commerce users about its features, to co-operate with universities and educational institutions in order to include subjects related to e-commerce in the study programme;
- to generate confidence and awareness, to create awareness among economic actors about the new digital globalization, to build confidence in e-commerce instruments, processes and networks, to get the support of public authorities, the media, prestigious brands and companies for the use of electronic commerce;
- to create social impact and public interest; to pay attention to public interest objectives, such as privacy protection, intellectual and industrial property rights and consumer rights; to encourage e-commerce contribution to the creation of new jobs;
- to promote the use of Spanish in electronic commerce; to promote the Spanish language on the Internet for e-commerce usage as a way of integrating the international Spanish-speaking community into it;
- to encourage the use of the Internet for the acquisition and selective propagation of commercial information, to make inventories of existing Internet-based systems and networks in Peru focused on e-commerce; to try to establish synergies among them.

As a consequence of the mentioned functions, the IPCE will permanently monitor global e-commerce trends and will take pertinent action to further adaptation by Peru.

IPCE is a semi-public entity in which private enterprises, local government authorities and international experts participate. In 1999, it selected two priority areas of activity: business-to-business electronic transactions, and “virtual banking”.

Sri Lanka

In 1995, Sri Lanka’s Trade Information Network (TradenetSL)[121] was instituted under the Ministry of Internal and International Commerce and Food and started operating at the Sri Lanka Export Development Board (SLEDB). It had three aims: (a) the dissemination of up-to-date information on trade, commerce and investment to a wide range of users including exporters, businessmen, government officials, researchers and trade chambers, (b) the provision of electronic communication/Internet services especially to small and medium enterprises, and (c) the popularization of e-commerce in Sri Lanka.

[121] See: http://www.tradenetsl.lk

These objectives are currently being executed by Cyber Trader — the e-business facility and "service arm" of TradenetSL. Trade information is disseminated through Cyber Trader's web servers, its website functioning as a "one stop shop" for all the information needs of a company. It contains trade statistics, provides profiles of more than 1750 enterprises and of over 350 Sri Lankan products; and it also gives a wealth of information on trade fairs, investments, trade policies, international markets, and commodity prices as well as training and promotional activities organized by the EDB. The Cyber Trader also offers a low-cost personalized business advisory service. Exporters can avail themselves of the opportunity to contact a professional and dedicated team of business information experts who could help to find answers to any queries regarding business issues such as trade opportunities, events in target markets, product-specific standards,regulations applied in importing countries and implications of International Trade agreements.

Currently, this service is utilized by around 10 businessmen every day. Moreover, foreign buyer/seller inquiries that are received at Cyber Trader are directed to its 300 strong membership, thereby enhancing the competitive edge enjoyed by registered member companies. The habitual use of electronic communication among the business community is encouraged by Cyber Trader through the provision of email and Internet services and connections, especially to small and medium-sized business enterprises. In fact, the drive by EDB to popularize the use of IT has not been limited to Colombo — the commercial hub of Sri Lanka. The EDB has also opened regional e-commerce centres in key areas in the country such as Matara, Hambantota, Galle, Kandy and Kurunegala where selected SMEs are being given a basic training course in IT. Cyber Trader also undertakes, as an important part of its services, to design web pages, place advertisements on the net and prepare multi-media CD ROMs for individual companies and business organizations. Cyber Trader's promotional activities are, however, not confined to the company level. Significant trade events in Sri Lanka, regional and international trade fairs and other trade promotion missions are advertised on the web; CD-ROMs which are prepared for any of these events are given maximum exposure abroad by circulating them among foreign trade chambers, multinational companies and Sri Lankan missions overseas.

The creation of an e-commerce infrastructure has been a top priority of the Sri Lankan Government. To serve this objective, EDB, through TradenetSL, carried out a thorough feasibility study in liaison with many other key public and private organizations, such as the Sri Lanka Customs, Sri Lanka Ports Authority, the Board of Investment of Sri Lanka and the Ceylon Association of Ships' Agents, in order to support the creation of a country-wide low-cost web-based Electronic Data Interchange Network. Initial steps to establish such a network have already been taken.

South Africa

Over the last few years, South Africa has made impressive progress in various e-commerce-related activities. Most of the developments have come from the private sector. Cellular telephones and other advanced telecommunication services such as ISDN are widespread and the business community has rapidly adopted the use of the Internet. About 40 000 corporate addresses have been registered under the co.za domain, many advertisements now carry a URL, roadside billboards advertise access to the Internet, most television and radio shows have their own website and about 20 daily and weekly newspapers have online versions. Electronic banking, events booking and ticketing and online purchases of most major products are possible through local Internet service providers.

A number of individual government departments have been developing their own ICT-related policies and programmes for some years. But the first concrete indication of an overarching national framework for information and communication technology policy came

in March 1998 when the South African cabinet approved a proposal to develop a broad national information and communication technology strategy, for which overall responsibility rests with the Department of Communications (DOC), the public service arm of the Ministry of Posts, Telecommunications and Broadcasting. To co-ordinate the development of the strategy, the DOC has convened a variety of inter-departmental forums with the ministries of Trade and Industry, Finance, Justice, Arts, Culture, Science and Technology, and the public service.

More recently the DOC has been engaged in a number of other ICT projects and policy initiatives, recently grouped under the "Info.Com 2025" banner, including the launch of a public debate on policies to accelerate the use of e-commerce. The aim is to identify the infrastructure and regulatory requirements in areas such as taxation, digital signatures and authentication, public privacy, intellectual property and encryption. A variety of working groups have been established on the issues and the debate will be continued in public meetings and on the Internet.[122]

An inter-ministerial committee to look into the development of a multipurpose universal smart card was established last year, comprising members from the private sector and the other relevant ministries, such as Home Affairs, Transport, Finance and Health. The various parties have signed an MOU on the development of a common platform for the smart card, including the Banking Council.

The development of a Public Internet Terminal (PiT) is aimed at providing a "one-stop shop" for the public through the use of public access kiosks comprising a touch-screen, keyboard, printer and smart-card reader to be deployed initially at Post Offices. Aside from providing Internet and email, the public will be able to obtain access to private-sector and government services through the web, such as identity documents and drivers' licences as well as distance education and information on tenders, jobs, health and welfare services. The postal delivery network will be leveraged to allow the PiTs to offer online shopping and other e-commerce facilities as well. A pilot using 5 terminals has recently been completed and a further 100 terminals will be deployed shortly.

The PiT project[123] is closely tied to developments around postal policy which have been ushered in by a White Paper presented to parliament earlier this year. This identified access to basic postal services as a human right and an important plank in the government's programme to improve services in rural and marginalized communities. This has resulted in a strategic partnership with a consortium of international postal carriers led by a New Zealand operator. Plans to substantially expand the number of post offices from its current base of about 2000 will include the development of a postal franchise system. The strategy also involves the issuing of an email address for every citizen and the provision of additional 4 million postal addresses over the next 3 years.

The private sector has been informed of the government's intention to develop a discussion document on e-commerce and subsequent green and white papers. The response to this has been mixed. Although this has been welcomed, concerns exist that the process may be too extended to develop policies that are useful to the country. Having expressed that opinion, organizations and institutions are currently preparing positions on e-commerce that will be presented to the Government for consideration.

[122] A special website has been set up for the process at http://www.ecomm-debate.co.za

[123] Http://www.pit.co.za

Regional initiatives and potential for regional cooperation

Apart from the instruments promoted in the context of the European Union (see below) or as part of regional free trade agreements such as NAFTA, few examples exists today of regional endeavours in the area of e-commerce. For developing countries, this is certainly a path worth pursuing since it may bring them three types of benefits at least:

— additional weight in international discussions and negotiations on e-commerce,

— a broader pool of experiences on which to build national policies and international positions, and

— a way to link trade-related regional integration efforts (e.g. in areas such as customs or transport) to e-commerce promotion efforts.

An interesting example in that respect could soon be considered in Latin America, where the secretariat of the Andean Community has initiated efforts to develop regional norms and standards for electronic commerce. Other regions and sub-regions could follow similar paths soon, particularly those in which linguistic commonalities can help the development of original legal and normative tools.

Cross-sectoral issues to be handled at the national level

1. Legal and regulatory framework

The existence of a supportive and predictable legal framework is an important prerequisite for enhancing trust in electronic commerce and thus promoting its development. Although there is a general consensus that the current legal infrastructure is generally applicable to electronic commerce, most national laws were developed in the absence of electronic systems. Concerns had been expressed that existing paper-based legal systems might be unable to accommodate electronic commerce and could lead to uncertainty, which would hamper global electronic trade. The speed at which electronic commerce will develop, depends to a large extent on the existence of a favourable legal environment that facilitates electronic commerce by boosting the trust of both businesses and consumers. Having recognized the importance of an appropriate legal framework, most national Governments have enacted or are in the process of enacting/updating legislation to cater for electronic commerce.

> In order to assess the potential impact on developing countries of the legal and regulatory developments at the international level,[124] an Expert Meeting on Legal Dimensions of Electronic Commerce was convened under UNCTAD auspices in Geneva in July 1999.[125] The Expert Meeting acknowledged that most of the existing rules and legislation would in general also apply to electronic commerce, but expressed concerns that the existing paper-based legal systems might be insufficient to accommodate electronic commerce and might create uncertainty. In particular, the requirements in national laws for “written”, “signed” or “original” documents were considered to

[124] See Report of the Expert Meeting on Capacity-Building in the Area of Electronic Commerce: Legal and Regulatory Dimensions, TD/B/COM.3/28, of 11 AugustUNCTAD Report “Legal Dimensions of Electronic Commerce”, TD/B/COM.3/EM.8/2 of 4 May 1999.

[125] See Report of the Expert Meeting on Capacity-Building in the Area of Electronic Commerce: Legal and Regulatory Dimensions, TD/B/COM.3/28 of 11 August 1999.

constitute barriers to the development of electronic commerce. The importance of establishing an internationally acceptable harmonized legal framework for electronic signatures and authentication was particularly highlighted by the Experts. During the Meeting the following specific concerns [126] of developing countries were singled out:

- The lack of internationally acceptable rules and guidelines for the recognition of electronic signatures, digital signatures and certification authorities;
- Restrictions imposed on the export of technology, especially with respect to state-of-the-art encryption standards;
- The need for an international scheme for registration of domain names;
- Problems arising from the application of traditional principles on jurisdiction and applicable law in an electronic environment;
- The need for wider dissemination of information on international developments pertaining to the legal and regulatory aspects of electronic commerce, as well as a need for training and education, especially for small and medium-sized enterprises;
- The need for technical assistance to developing countries, and particularly the least developed countries (LDCs), in adapting their national law to accommodate electronic commerce.

To address some of those concerns, the Expert Meeting adopted a number of recommendations[127] addressed to national Governments, the international community and UNCTAD. The following recommendations addressed to Governments are considered as requiring action at a national level:

- To examine the existing national legal infrastructure to assess if paper-based form requirements prevent laws from being applied to electronic transactions and to determine whether such form requirements should be adjusted to make laws technology-neutral and permit their interpretation and application in an electronic environment.
- In reviewing their legal infrastructures, Governments are encouraged to give consideration to using the UNCITRAL Model Law on Electronic Commerce, as well as other instruments on electronic commerce prepared by UNCITRAL and other organizations, as a basis for preparing new laws or adjusting current laws. Where appropriate, Governments should also consider the introduction of rules to give certainty with regard to the legal effect of using specific technologies within a technologically neutral legal infrastructure.
- Governments of developed countries are urged to dismantle barriers to global electronic commerce for developing countries by removing restrictions on the export of technology, especially with respect to state-of-the-art encryption systems and products, as well as associated technologies and computer systems.
- Governments of developed and developing countries, especially those who are members of regional economic groupings, are encouraged to establish cooperative relationships so as to increase their capacity to deal with the complexity of the issues that have arisen due to the development of information and communication technologies. These include

[126] See paras. 32-35 of the Report of the Expert Meeting.

[127] *Ibid*., as to the “Agreed Conclusions and Recommendations”, paras. 4–13

developments in such areas as taxation, customs, intellectual property, domain names, computer crime, Internet content regulation, privacy and data protection, consumer protection, certification authorities, and the role of accreditation and standardization bodies.

- Governments of developing countries are encouraged to participate in the preparation of various legal instruments being considered in international forums and to promote public awareness and education of all aspects of electronic commerce and the opportunities and benefits it offers.
- Finally, the international community is requested to provide assistance to developing countries in reviewing and adapting their national laws to accommodate electronic commerce, promoting awareness, education and training in the legal and regulatory aspects affecting electronic commerce.

2. Empowering local enterprises

National action is also required to ensure that local enterprises (in particular smaller ones) can actually use the tools of e-commerce to which they have access. This can be done, in particular, by fostering "efficiency instruments" generally described under the UNCTAD-created concept of *trade efficiency*. Such tools cover a broad array of domains, ranging from trade facilitation, customs automation, transport optimization (e.g. through computer-based cargo tracking systems), to insurance and banking (including export financing and credit insurance). An approach such as that of trade efficiency has proved remarkably useful to avoid a divorce between the "new economy" and the "physical side of trade".

On the other hand, smaller firms in developing countries often have little or no experience of international markets. Among the most often quoted obstacles to their participation in global electronic commerce, local entrepreneurs mention the use of a foreign language, and the difficulty to understand and adopt dominant business practices. In that respect, it is largely the responsibility of local governments to promote the use of local languages and practices on the Internet, and consequently in e-commerce. The flexibility of available technologies, software and interfaces is often underused in that respect. Those countries and regions where efforts have been made to allow local enterprises to use languages other than English have seen a significant increase in local SMEs' interest for e-commerce[128].

Conclusion

Although it is clear that those countries in which policies of de-regulation and openness (in telecommunications, Internet access provision and related services) have fared better than others in terms of enhancing their information infrastructure, lowering access prices and promoting e-commerce generally, it would certainly be wrong to believe that Governments do not have central responsibilities to play to ensure that e-commerce (and more generally information and information technology) are a source of economic benefit and social improvement to all parts of the population, in particular in rural areas.

[128] On this aspect, see the opening address by Boutros Boutros-Ghali, Secretary General of Francophonie at the First Meeting of Partners for Development (Lyon, France, 16–18 November 1998). Such efforts are certainly not limited to major languages like French, as shown by the successful example of Peru, where sites in local Indian languages such as quechua are attracting an increasing number of visitors. See http://ekeko.rcp.net.pe.

In many respects, when national action is being considered to promote e-commerce, it is important for relevant authorities, public and private, that their efforts should aim at creating a local "e-commerce culture". Involving all relevant components of the economy (including information intensive activities and more traditional ones), and encouraging the expression of local initiatives, concerns and proposals is also an important condition of the relevance and sustainability of such action.

Section II — Some multilateral dimensions of e-commerce

Global by nature, e-commerce has emerged as a significant force driving trade in the absence of international rules. Some might even argue — because of their absence. The question is whether this is the right framework for its further expansion and growth. A number of issues are increasingly gaining attention domestically, including consumer protection, privacy of data, taxation and applicable legal jurisdiction. At the same time these issues and their solutions tend to stretch beyond the boundaries of a single country. The main driving force for national Governments to seek some international coordination of efforts is the fear of unilateral action, which may lead to imposition of trade barriers and recourse to uncompetitive practices. What might be the minimum international rules that would be adequate to prevent such negative practices and be compatible with the overall development objectives of developing countries?

E-commerce as a new issue in the WTO

How could the electronic commerce revolution improve the competitiveness of developing countries in international trade? Exchange of experiences among countries — among both developed and developing — is a powerful tool to help to identify the reasons for success or lack of it so as to develop optimal policy approaches aimed at promoting and securing the proper climate for the growth of e-commerce. Electronic commerce has produced real shocks to the economy, which are leading to the redistribution of resources. Notably, e-commerce has meant the growth of capital productivity through capital-augmenting technological change, which in turn is leading to growing supply capacity[129]. All these processes are expected to lead to changes in capital and labour markets where Governments in developing countries could help improve capital and skills allocation to technology-sensitive industries. The development of the adequate characteristics of human resources which would allow developing countries to benefit from the instruments of e-commerce would be determined by the following demand and supply factors: (a) the demand for qualified personnel for employment in the private and public sector; (b) the ability to practice e-commerce by individual enterprises and consumers; (c) inter-firm specialization enhanced by e-commerce; and (d) application of selected e-commerce aspects in other areas of social life, including education, medical and government services.

The concept of e-commerce entered the realm of the WTO at the second WTO Ministerial Conference in May 1998, where ministers agreed "to establish a comprehensive work programme to examine all trade-related issues relating to global electronic commerce" and reaffirmed that at least until the WTO Conference in Seattle in 1999, members would "continue their current practice of not imposing customs duties on electronic transmissions".

[129] See chapter 2 above.

From the WTO point of view, the impact of e-commerce to a different degree concerns trade in services, intellectual property rights, standards, government procurement, trade in goods and development issues. The WTO work programme was established in September 1998 to explore the aspects of e-commerce relevant to international trade. Discussions were held and reports completed by July 1999. Subsequently, the discussions were held in different WTO bodies, aimed at looking into the need of e-commerce for international trade rules. Many of the WTO members with already well-established e-commerce practices were calling for minimum regulations — both, nationally and internationally. However, it was important to examine on what issues countries should agree multilaterally in order to prevent unilateral actions by individual states, which might disrupt the growth of e-commerce. In that respect, existing WTO Agreements were reviewed as to their relevance for creating a predictable legal environment and their applicability to e-commerce. The question of new rules or the approach to e-commerce as a separate subject in the WTO framework has been raised but was put aside since the existing agreements seemed to meet the minimum needs for regulations in the area of e-commerce. There was no attempt to define what is the meaning of e-commerce, rather what is being traded and what preconditions are necessary for e-commerce to take place. Two key areas emerged as particularly important for the development of e-commerce — the General Agreement on Trade in Services and the Agreement on Trade-Related Intellectual Property Rights. The language in both agreements has been determined as technologically neutral and adequate to trade issues arising from e-commerce. Provisions relating to the protection and enforcement of intellectual property rights do not yet offer fully comparable safeguards in the digital environment. The piracy of copyright material and unauthorized use of trademarks or brand names has therefore become a central issue. However, the bulk of work relevant to the latter was taking place outside the WTO (e.g. in WIPO). Thus, the main question in TRIPS (Trade-Related Aspects of Intellectual Property Rights) became how to secure principles embedded therein in the e-commerce environment, since products traded electronically usually have high intellectual property contents.

The longest debate evolved in the area of GATS, leaving a number of areas for further clarification and discussion. The importance of GATS could also be attributed to the particularly prominent role of services in the area of e-commerce, primarily the infrastructure services of telecommunications, as well as emerging new services, including producer services.

Trade in services and e-commerce

The following types of service are of particular importance in e-commerce: telecommunication services providing network access via the Internet; Internet access services; and specific services (or service product) supplied over the Internet (e.g. consultancy, telemedicine and distribution services). New services have also emerged such as web hosting, authentication and data “push” services, which may not yet raise regulatory concerns since their treatment would fall under the computer and related services category. Even when the actual product supplied is a good or new digital product, transactions will involve distribution services as a component. Which GATS‘ specific commitments apply to e-commerce raises the question of electronic transmissions and their service content. One principle is clear: the introduction of e-commerce into GATS should not compromise the level of existing commitments by nullifying the level of commitment extended in different sectors. For example, policy-makers may be concerned where provision of certain services is banned or limited (e.g. gambling or restrictions on advertising), but they will be supplied freely via the Internet. The approach for scheduling commitments on e-commerce has to be further elaborated. Since GATS language is technology-neutral, any type of internationally-traded service, by any technological means, included into the classification and commitments under

the GATS will fall under the framework agreement. However, GATS' specific commitments do not need to be identical and may differ depending on how they are supplied.[130] Thus, the notion of technological neutrality[131] cannot be automatically and retroactively applicable to market access and national treatment commitments negotiated in services without specific new negotiations in this respect.

Caution in discussing e-commerce based services is essentially due to the lack of knowledge and experience of what the potential expected impact of e-commerce may be on domestic economy and what appropriate regulatory tools may be needed in the future in this respect. The new negotiations on services could determine how e-commerce enters the GATS by way of their inclusion into the schedules of commitments, while future contested issues arising from trade in e-services could be addressed and settled through the DSB (Dispute Settlement Body). Alternatively, discussions on e-commerce may continue with accumulation of experience — and judging how fast it is growing — may be settled in a few years' time. In the meantime, issues such as relevant standards (including for security of transactions), could be established as universal and technology neutral, as well as mutual-recognition agreements negotiated to include any interested trading partners, including developing countries, as the key prerequisites for the expansion of e-commerce.

Domestic regulations are few in the area of e-commerce but are important in assuring that the lack of predictable legal environment domestically does not detract from the opportunities offered by e-commerce. The application of GATS provisions concerning monopolies, exclusive service providers and business practices to e-commerce could benefit from further elaboration. To promote a competitive environment in e-commerce-related services (e.g. the issue of software) is particularly relevant to e-commerce as the means of trade. Here, neutrality and universal access on a competitive basis in obtaining and using the software products and services should be secured as one of the principles governing e-commerce. The same applies to the overall conduct of competition policy. Development of pro-competitive regulatory principles at the multilateral level should limit trade distortions through abuse of dominant market positions.

Provision of Internet access is not formally covered by GATS though any country may choose to include them unilaterally. The WTO classification of services has so far covered these services only partially, with respect to business network services as opposed to universal services, as classified under the UN CPC Rev. 1 item 84200 "on-line access services". The market for such services is evolving rapidly in most countries, and they are usually provided not only by the local telecom service provider (which may often be the only provider under the monopoly of basic telecommunication services) but also by a number of independent providers for which market access and national treatment may be negotiated multilaterally.

[130] Countries may have different requirements for the supply of service depending on the mode: e.g., if the medical doctor establishes the office abroad – the license is issued based on the population criteria; if the doctor crosses the border to supply services in person in that office – special proficiency and language examination is required; if the doctor remains in the country of origin, but the patients come the office – insurance schemes would not cover their treatment abroad; if the doctor is engaged in e-commerce of health services, another criteria may still be introduced.

[131] The issue of technological neutrality has been used in the negotiations on basic telecommunications, but it does not have a binding legal status and should not be confused with application of such a concept to GATS sectors and modes of supply in general. This understanding meant that any basic telecom service listed in the schedules of commitments may be provided through any means of technology e.g. cable, wireless or satellites unless otherwise noted in the sector column. It should also be noted that the Annex on Telecommunications provides that each member shall ensure that any service supplier of any member is accorded access to and use of public telecommunications transport networks and services on reasonable and non-discriminatory terms for supply of services scheduled. Restrictions on means of delivery of a service could be scheduled horizontally or as a national treatment restriction.

The form e-commerce takes involves issues related to: (a) Internet, and (b) telecommunication services provided via the Internet. Market access and national treatment in this respect would be defined in the schedules concerning telecommunication services. A precondition to the expansion of e-commerce is the development of low-cost telecommunications and the financial instruments necessary to facilitate e-commerce domestically and internationally. Governments can help to ensure fair competition through a strengthening of the relevant regulatory institutions. To a large extent, developing countries will succeed in developing e-commerce if Governments take a proactive position and a leading role in the application of e-tools and e-commerce as part of a comprehensive policy approach.

Other aspects

E-commerce pertains not only to the cross-border movement of services but also to the commercial presence and movement of natural persons. In the case of the establishment of a commercial presence by a service provider in the host country, this foreign service provider may also engage in providing services to its customers, whether domestic or foreign, over the Internet. The outsourcing of software development to other countries, as e-commerce in computer-related services, may lead to the establishment of a commercial presence and may require short-term visits of their service professionals to the customer sites.

As a result the liberalization of e-commerce related trade should also include measures affecting (1) commercial presence and (2) presence of natural persons engaged in e-commerce related trade. This would include removal of the economic means.[132]

The growing importance of new technologies and new forms of business organization are the factors behind the growing demand for specialized expertise, while the growing dynamism of the markets means shorter reaction-time for problem-solving, which at times calls for the immediate availability of service professionals. The movement of experts is also taking place in both directions between developing and developed countries: on the one hand, it is investment-related movement into the markets of developing countries,[133] on the other, it is a response to a growing demand for these types of services, exacerbated by the need to adapt to the requirements of new technologies in developed countries.[134] Internet contributed to lowering costs and improvement in the dissemination of information in the process of job hunting and placement by prospective employees and employers, leading to the ever-decreasing tenure of workers and high dissemination of employment.

Should the practice of not imposing customs duties on electronic transmissions be made permanent? Further liberalization of cross-border trade in services, leading to granting of full national treatment for these transactions, may render the question irrelevant in the services context. However, in the area of fiscal measures concerns arise among all countries in terms of the expected fall in tax revenues.[135] Particular difficulties will face countries that do not have sophisticated tax collection systems: difficulty in assessing taxes/duties on e-commerce

[132] Some countries require passing quantitative and/or qualitative tests in order to supply the service in their markets. No criteria or rules on procedures have been established in the GATS in this respect.

[133] In the context of a developing country, severely short of foreign direct investment and advanced labour skills, prospective foreign suppliers of service are not the types of individuals that compete with domestic unemployment.

[134] The problem of attracting and retaining employees in the IT industry firms is increasingly difficult. For example, Intel needs to recruit 7 500 technical and managerial staff members each year, according to the International Herald Tribune, Oct. 5 1999 while the average worker in information technology professions switch jobs every six months leading to the generally accepted turnover of 50%.

[135] See chapter 2 above.

based service transactions may render this issue difficult to tackle in developing countries. Possibly, online trading may potentially undermine tax exemptions used to attract investment. In that sense, e-commerce may render tools to promote economic development ineffective.

Additional analysis and introduction of appropriate regulatory instruments may be particularly important in developing countries in order to further advance and use e-commerce. As a transitory measure, emergency safeguard measures may be needed in the cases where e-commerce related activities create unforeseen developments in domestic markets. More analytical work is necessary before concluding how opening up of the market for government procurement through e-commerce could enhance efficiency and welfare in developing countries.

The issues of taxation and consumer protection at large remain outside the GATS and the WTO. However their importance has been increased by the expansion of e-commerce. The growth in consumer confidence means the growth in global e-commerce, hence consumer protection/legal jurisdiction became of key importance here. The measures concerning protection of information/data/privacy are covered under the provision of GATS for general exceptions; however, these are of the nature of exceptions, not general principles. For the development of e-commerce, not so much in business-to-business transactions, these issues remain of utmost importance. To a large extent, the inability to address them undermines the advantages that small and medium firms could otherwise be able to obtain through e-commerce. Companies with commercial presence would be often in a better position to sell their services over the Internet due to the higher consumer confidence. The same applies in the case of brand-name products. In this respect, it may be in the interests of developing countries to address these issues in the context of discussions on e-commerce.

Conclusion

The Development of e-commerce and of new technologies has overtaken the pace of regulatory adjustment. Each country is faced with regulatory adjustment related to privacy, authentication, legal validation of electronic contracting, security of transactions, liability and the jurisdiction that applies to the transaction (of the buyer or seller) and also consumer protection. Not all of these issues may or will be addressed through the international rule-making mechanisms, but some will.

Lack of appropriate physical infrastructure has so far placed major restraints on the growth of e-commerce in developing countries. In the longer term, availability of physical capacities rests on the liberalization of the basic telecommunications networks and services, reform of the regulatory institutions and creation of independent regulators. The latter is an issue of building effective institutions and is also related to the specific negotiations on trade in services in the WTO.

Some other international dimensions of electronic commerce: legal aspects

It is generally acknowledged that fragmented and diverse national approaches to the legal issues would adversely affect the development of electronic commerce. The preparation of international model laws and standards which could be used as guidelines at the national level in preparing domestic laws would have significant impact in facilitating electronic commerce. To this end, a number of organizations such as ECE, OECD, UNCITRAL, WIPO and the Commission of the European Communities have been active in producing model laws, international treaties and guidelines covering various aspects of electronic commerce. They include the WIPO Copyright Treaties 1996, UNCITRAL Model

Law on Electronic Commerce 1996, the OECD Guidelines for Cryptography Policy 1997 and its Draft Guidelines for Consumer Protection. The following provides examples of international model laws and contractual provisions.

Model laws and guidelines

(i) UNCITRAL Model Law on Electronic Commerce.

The United Nations Commission on International Trade Law adopted in June 1996 the Model Law on Electronic Commerce (hereinafter referred to as the Model Law). The Model Law aims at facilitating electronic commerce by providing a set of internationally acceptable rules and legal principles that can be used by States in enacting legislation to remove legal uncertainties arising from the application of paper-based rules and regulations in an electronic environment.[136] The Model Law is accompanied by a "Guide to Enactment" that aims at providing national legislators and users of electronic commerce with further explanations as to the meaning and intent of the provisions of the Model Law.[137]

The Model Law establishes a number of key principles. It clearly establishes the principle that the information should not be denied legal validity and enforceability simply because it is provided in an electronic form. It also sets out requirements that should be met by a data message in order to be treated as equivalent of "writing", "signature" and "original". In other words, it adopts the "functional equivalent approach", which is based on an analysis of the purposes and functions of the traditional paper-based requirements with a view to determining how those purposes or functions could be fulfilled through electronic means.[138] Other issues covered by the Model Law includes rules governing the admissibility of data messages as evidence in legal proceedings and their evidential value, provisions on storage of data messages, formation and validity of contracts, attribution, acknowledgement of receipt, time and place of dispatch and receipt of data messages, as well as specific provisions pertaining to carriage of goods. [139] A discussion of many of the provisions of the Model Law may be found in document UNCTAD/SDTE/BFB/1 paras 15–23 and 93–179.

Since its adoption, the Model Law has been used by a number of countries considering an appropriate response to the issues of electronic commerce. A number of countries have recently introduced, or are about to introduce, legislation either adopting the Model Law or addressing related electronic commerce facilitation issues.

(ii) UNCITRAL Draft Uniform Rules on Electronic Signature.

The establishment of internationally acceptable rules and guidelines governing electronic signatures (i.e. any electronic symbols or characters used to identify the signatory and his approval of the message) is considered essential for the development of global electronic commerce. To this end, upon completion of the Model Law, UNCITRAL began work on the preparation of uniform rules aimed at promoting certainty and confidence in electronic commerce. The UNCITRAL work initially focused on digital signatures and certification authorities. It was, however, decided that in line with the approach taken in relation to the

[136] As to the objectives of the Model Law, see the UNCITRAL Model Law on Electronic Commerce with Guide to Enactment, 1996, paras. 2-6.

[137] See Guide to Enactment of the UNCITRAL Model Law on Electronic Commerce, 1996, para. 1.

[138] *Ibid*, para. 16.

[139] A discussion of many of the provisions of the Model Law may be found in document UNCTAD/SDTE/BFB/1 paras. 15-23 and 93-179.

Model Law, to adopt to the extent possible, the approach of technology neutrality so as to avoid excluding any future technologies from the scope of the uniform rules. The draft uniform rules covers all forms of electronic signature including those signature techniques capable of providing a higher degree of reliability by describing them as "enhanced electronic signatures".

The draft rules which were considered by the last session of the UNCITRAL Working Group, held in September 1999, included provisions dealing with the principle of technology-neutrality, party autonomy, presumption of signing and original, duties and responsibilities of the signature holders and of information certifiers, reliance on signatures and certificates, and recognition of foreign certificates.[140] It is expected that the Uniform Rules would be completed during the next session of the Working Group, which is to be held in New York in February 2000.

(iii) EU Directive on Electronic Signature.

The main objective of the Directive[141] is to facilitate the use of electronic signatures and contribute to their legal recognition by establishing a harmonized community-wide legal framework for electronic signatures and electronic certification services. The Directive adopts a technology-neutral approach based on a wide concept of "electronic signatures", encompassing various electronic means of authentication, including digital signatures. The provision of certification services is not subject to prior authorization, but Member States may introduce or maintain voluntary accreditation schemes aiming at enhanced levels of certification-service provision, provided the conditions related to such schemes are objective, transparent, proportionate and non-discriminatory. Certificates issued in a third country are considered as legally equivalent to certificates issued in the European Community provided certain stipulated conditions are met.

Contractual models

Not all legal issues of electronic commerce need to be regulated by national or international law. In most jurisdictions, parties to electronic transactions are permitted, within certain limits, to agree among themselves on the rules and standards applicable to their contractual relationships. The existence of international contractual clauses and provisions are, therefore, of paramount importance in facilitating the practice of electronic commerce.

Interchange agreements or "trading partner agreements" have been developed over the past years to overcome uncertainties arising from the existing laws/legislation regarding the use of electronic means of communication. Examples of such contractual models include the European Model EDI Agreement prepared in 1994 by the Commission of the European Communities[142] and the Model Interchange Agreement for the International Commercial use of EDI, adopted by the UN/ECE in 1995.[143]

More recently and taking advantage of the experience gained with the EDI Interchange Agreement, the ECE has prepared a draft "Electronic Commerce Agreement" (E-Agreement)[144] that intends to serve the commercial requirements of business-to-business

[140] See UNCITRAL document A/CN.9/WG.IV/WP.82. See also document A/CN.9/WG.IV/WP.84 which contains draft Uniform Rules on Electronic Signatures to be considered by the next session of the UNCITRAL Working Group in February 2000, in New York.

[141] For the text of the Directive, see document 98/0191 (COD), Brussels, 30 November 1999.

[142] See *Official Journal of the European Communities*, No. L338/105, 28 December 1994, annex 2.

[143] UN/ECE Recommendation No. 26.

[144] See the UN/CEFACT Legal Working Group, "Electronic Commerce Agreement", 23.01.1999/Rev.1.

electronic commerce partners. It provides a basic set of provisions that enable electronic-commerce transactions to be concluded by commercial partners within a sound legal framework. Commercial partners engaged in contractual relations based exclusively on EDI are recommended to continue to use the EDI Interchange Agreement, while commercial partners engaged in contractual relations based on the use of a combination of electronic commerce technologies including EDI are recommended to use the E-Agreement. It should, however, be remembered that these agreements are of contractual nature and can only be effective and binding between the parties and cannot regulate the rights and obligations of third parties. Furthermore, they cannot overcome requirements arising from mandatory laws and regulations.

Other international legal issues

Many other issues affecting e-commerce have started to be tackled at the international level either in inter-governmental circles or in other foras. This is the case in particular of intellectual property issues in the context of the World Intellectual Property Organization (WIPO), which is soon extending to new fields like Internet domain names issues, through WIPO's prerogatives in the area of trademarks for example[145].

Over the last few years, the issue of domain names has been a truly fascinating one in terms of how existing structures (such as WIPO) and new ones (like ICANN[146]) adapt to a rapidly changing environment. In that respect, WIPO[147] has fared remarkably well, and showed a superior ability to address new issues and challenges without renouncing any of its initial mandates or responsibilities. It is likely that other inter-governmental bodies will find inspiration in the example of WIPO to upgrade and update their own approaches to e-commerce related issues[148].

[145] See http://ecommerce.wipo.int/domains.

[146] The Internet Corporation for Assigned Names and Numbers (ICANN) is the non-profit corporation that was formed in 1998 to assume responsibility for the IP address space allocation, protocol parameter assignment, domain name system management, and root server system management functions now performed under U.S. Government contract by IANA and other entities. See http://www.icann.org.

[147] See http://www.wipo.org, and in particular the success of "WipoNet", as a true instrument of global knowledge and transparency. See also F. Williams "*WIPO: Taking up the digital challenge'* , Financial Times, 17 September 1999.

[148] Inter-institutional cooperation may benefit from this new type of approach. A first encouraging example can be found in the joint effort by ITU, UNCTAD and WIPO to create a joint website on electronic commerce.

Conclusion – Promoting e-velopment to build and disseminate knowledge globally

By working closely with the local and global players (current and potential) of electronic commerce, UNCTAD has been able to identify and assess some potent levers through which e-commerce could become a true engine for trade and development. To activate these levers, private and public components of civil society will have to accept new responsibilities and be able to exercise them.

By and large, the priority areas identified through the intensive consultation and discussion process of UNCTAD's workshops and roundtables on "E-commerce and development" clearly fall along the lines of the trilogy described earlier: access–knowledge–trust. Although local specificities have led different workshops to different formulations of recommendations for action, a strong level of commonality exists between their respective conclusions. Based on these conclusions, the main elements of an "agenda for action in the area of e-commerce and development" would include in particular the following:

1. Successful participation by developing countries in electronic commerce will rely on the strengths and resources available in the developing countries themselves. These would include: (a) the level of Internet connectivity and the quality of the telecommunications infrastructure, (b) innovation in the techniques and modalities of international trade as well as in the use of the Internet, (c) mutual respect and collaboration between the Government and the business sector; and (d) a significant presence of local enterprises involved in electronic commerce.

2. Participation in electronic commerce will not be at the level of its potential unless existing obstacles are clearly identified and tackled adequately. The main obstacles for increasing the participation of developing countries and their businesses in electronic commerce are the following:

   Access — Measures need to be taken to allow enterprises (especially SMEs) to get better access to the telecommunications infrastructure and the Internet; this includes not only a physical access but also economic access. All measures (normative, fiscal, technical, and so on), aimed at bringing down the cost of Internet and electronic commerce access, deserve close attention. In particular, the liberalization and deregulation policies of the telecommunications sector and of Internet access should be considered critical instruments to stimulate electronic commerce.

   Content — International information flows are still characterized by a significant imbalance in favour of the most advanced countries. For many enterprises in developing countries, this situation means additional difficulties to their participation in electronic commerce. Therefore, the creation of a more national and regional content is an aim that needs greater cooperation between the State, enterprises and learning institutions.

   Knowledge — In the field of electronic commerce the lack of knowledge could be a major source of "fear" and could hinder a more active participation by developing countries and their enterprises in the most modern part of global trade. On the other hand, the almost daily progress of electronic commerce technologies means that

knowledge about it is not available from theoretical books or conceptual analysis. Those who practice electronic commerce are the ones who know most about it. This means that additional efforts should be made to enhance the practice of electronic commerce in developing countries, particularly among SMEs. In this context, the support provided by international and regional organizations could be an essential instrument to contribute directly to the efforts of the Governments and businesses of the developing countries, and to stimulate exchange of experiences among the countries.

Trust and security — Trust-based relationships between all actors involved is a crucial element for the development of electronic commerce. More national and regional initiatives are required to create the necessary instruments for the adoption of digital signatures, electronic payments and contractual guaranties for electronic transactions. In this context, international norms could be a vitally important instrument.

Legal and normative framework — Besides deregulation of the telecommunications sector, measures should be taken to overcome the insufficiency of legal instruments for the development of electronic commerce. The Model Law of the United Nations Commission on International Trade Law can prove to be an instrument of great help for countries that want to establish their own legal framework for electronic commerce.

Mobilization of the "physical" part of the economy — It would be a mistake to think that electronic commerce is a "virtual" world isolated from the physical aspects of the economy. The implications of electronic commerce should be anticipated and dealt with in the production chain as a whole. This means that the success of developing countries requires that the relationship between the "information" part of their economies and the physical part of their commercial sector be taken into account and encouraged. The State can play a major role in stimulating the participation in electronic commerce through its policies on trade support sectors, such as customs, transports, banks and insurance.

Training — The development of national and regional capacities in the field of electronic commerce has to be encouraged at all levels. The inclusion of subjects related to information, Internet and electronic commerce within primary and secondary schools and university curriculum can be complemented by training programmes for entrepreneurs. Particular efforts should be made to favour the "training of trainers", and can include the participation of such international organizations as UNDP, the World Bank and UNCTAD.

3. Developing countries should participate actively and positively in the implementation of international rules affecting electronic commerce. Developing countries must prepare themselves to get actively involved in WTO discussions on commerce. Furthermore, this active participation should be reflected in other frameworks such as the discussions about domain names (ICANN and WIPO) and about the future of the telecommunications norms and related arrangements (accounting rates) which will be discussed in the framework of the International Telecommunications Union (ITU).

4. It will be important for developing countries to be able to count on international support in order to obtain projections and economic analyses about different fiscal scenarios and to stimulate co-operation among countries. In that sense, the regional seminars organized by UNCTAD in Lima, Nairobi and Colombo can be considered as

useful models that could be repeated in the future to examine the results of the Seattle meeting and its consequences for developing countries. Moreover, the Internet website created by UNCTAD for the regional seminars should be used as an instrument to pursue the cooperation initiated between the participants in the seminars.

5. UNCTAD's future work in the area of electronic commerce should comprise the following activities:

— To continue to support further promotion of exchange of experiences among enterprises involved in electronic commerce, raising their awareness about ongoing efforts to establish legal and regulatory frameworks for e-commerce.

— To facilitate training activities in the area of e-commerce in developing countries and provide information to these countries regarding on-going multilateral negotiations on e-commerce and related issues in WIPO, WTO, ITU and other organizations.

— To collect and disseminate information regarding electronic commerce and development, including work being undertaken in other various forums. In this regard, different vehicles for data collection and dissemination are to be used, including practical booklets, CD-ROMs and websites.

— To provide analytical and statistical studies on the various aspects of electronic commerce which are of particular importance to developing countries in their efforts to increase their participation in international trade. Such studies should cover, *inter alia*, the interrelationships between electronic commerce, on the one hand, and trade efficiency services, for example customs, transport, banking, insurance and telecommunications, on the other.

— To keep developing countries informed about developments in techniques, tools and solutions being used by more advanced players in the field of electronic commerce.

Building confidence

Beyond the "e-commerce trilogy" access–knowledge–trust, the process of confidence building will be essential to the truly global development of electronic commerce. Building confidence starts at home, that is, in one's own country, enterprise or community. And it starts with self-confidence: the ability to use one's own language, and to display and promote one's own culture are necessary components of "positive globalization". Indeed, it is only if globalization promotes diversity and equity, rather than uniformity and the unchecked interplay of market forces that it will gather the popular and planetary support necessary to its sustainability.

As was underlined many times here, electronic commerce can play an important role in the building of positive globalization, and the relationship between e-commerce and development will be a critical element in this process. However, it also emerged from the facts, figures and proposals of the present study that electronic commerce requires much more than technology, strategy and adequate legal instruments. Electronic commerce needs to be seen and promoted as a genuine new culture.

It is only if all relevant sectors of the local economy and society are committed to the success of an national policy on e-commerce that such policy has a chance to succeed. This means that dynamic and quasi-organic linkages and synergies must be maintained and used between the so-called "new economy" (the world of bits, information and knowledge) and the

traditional economy (the world of atoms, bricks and mortar, roads and bridges). The concept of ***e-velopment*** has been used in UNCTAD's recent work on e-commerce to help reflect this approach.

By ensuring that nationally, regionally and globally all components of the civil society are involved in designing, adopting and disseminating the economic, social, political and cultural components of relevant e-commerce strategies and policies, the e-velopment philosophy has the power to contribute to the emergence of a truly global "knowledge society". As far as developing countries are concerned, this is an opportunity that needs to be seized with the swiftness and foresight required by the current acceleration of history. The international community as a whole has an important responsibility in ensuring that developing countries have the capability to seize this opportunity, because there is too much to lose if this does not happen.

Sharing knowledge and building confidence should be two fundamental principles of positive globalization. In the very immediate future, the way in which electronic commerce will or will not be used as an engine for development will provide us a first indication on how actively these principles are being followed by Governments, business, local communities and individual denizens of the still emerging global information society.

Annex

LIST OF PARTICIPANTS IN UNCTAD'S REGIONAL ROUND TABLES ON ELECTRONIC COMMERCE AND DEVELOPMENT HELD IN 1999

1. REGIONAL ROUND TABLE ON ELECTRONIC COMMERCE AND DEVELOPMENT FOR LATIN AMERICAN AND CARIBBEAN COUNTRIES, LIMA, PERU, 4-5 AUGUST 1999

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Acevedo, Rommel	Secretario General Adjunto	ALIDE	Peru
Acha, Italo	Primer Secretario	Min. Relaciones Exteriores	Peru
Alvarado Pitman, Ana	Subdir.de Estudios	Academia Diplomatica	Peru
Alvarez C. Alfonso	Abogado	IPCE-Cibertribunal	Peru
Ames Sora, Luis	Dir.Desarrollo Telecom.	MTC	Peru
Arredono P. Jorge	Ger.Serv.Canales Dist.	Banco de Crédito	Peru
Avanzini Haro,Sofia	Consultora de Venta	MEKANO	Peru
Bartra, Valentin	Gerente General	Instituto Andino	Peru
Becerra Sanchez, Juan	Director	Min.Agricultura	Peru
Beltrán Vargas, Carmen	Asesor Legal	Cam.Comercio Int.	Peru
Benjel Gonzales, Ana	Responsable Com Elec	Min.Relaciones Exteriores	Bolivia
Bolduc, Kim	Representante	Prog.Nac.Uni.Desarrollo	Peru
Brain Delgado, Luis	Ger.Sistemas	INDECOPI	Peru
Brossard, Jaime	Subger.Informática	ONPE	Peru
Caillaux Zazzli, Jorge		DROKASA	Peru
Calderón Aguirre, Eva	Jefe de Inves. y Desarrollo	Min.Interior	Peru
Calderón, Lenin	Administradora de Red	MITINCI	Peru
Calderön Regso, Rosario	Dir.Sistemas y Racional.	MITINCI	Peru
Calderón Cristian	Abogado	Est.Guzman-Barrón	Peru
Catañeda Barreto, Orlando	Coordinador Productos	MITINCI	Peru
Camacho, Roberto	Funcionario Internacional	Comunidad Andina	Peru
Camarero, Javier	Ger.Negocios Internacional	Banco Santander	Peru
Campos, Ruy	Gte de Marketing	MEKANO	Peru
Cancela, Jose Luis	Director	Min.Relaciones Exteriores	Uruguay
Capeta Mondoñedo, F.	Jef.Consultoría Técnica	MEKANO	Peru
Casavilca R. Eduardo	Intendente	SBS	Peru
Castellares A. Rolando	Ger.Adjunto	Banco de Crédito	Peru
Cenzano Breña, Jorge	Asesor Viceminis.	Min. Pesquería	Peru
Chang, Raul	Repre.Com.Elec.	Vicepresidencia	Nicaragua
Chang Chang Fun, Luis	Consultor		Peru
Checa Gjrinovic, Guillermo	Gerente General	Telefonica Servicios Fin.	Peru
Chirinos Noves, Patricia	Asesora Legal	MTC	Peru
Cipriano Pirgo, Manuel	Asesor legal Concesiones	MTC	Peru

Ciurilizza Mellon, Alejandra	Coordinadora Rialide	ALIDE	Peru
Contreras Camacho, Luis	Consultor	MITINCI	Peru
Cornejo Fernandez, Eduardo	Ger. Internet	COSAPI DATA	Peru
Cuellar Pinedo, Eleonora	Coor.General	Foro Alta Tecnologia	Colombia
Cuenca, Luis	Ger. Desarrollo Tecnológico	COSAPI DATA	Peru
Dalcero, Pedro	Diplomatico	Min.Relaciones Exteriores	Brasil
Dangond, María	Funcionario Internacional	Comunidad Andina	Peru
Del Castillo Pacheco, Miguel	Jef.Produc.Banca Servicio	Banco de Crédito	Peru
Delgado, Rosa	Administardor Nuevos Serv.	SITA	Suiza
Escardó ,Eduardo	Presidente Ejecutivo	LIMATEL	Peru
Esquenazi Franco, Jacobo	Subdirector	SECOFI	Mexico
Fernandez Gonzalez,Juan	Coordinador	Com.Cub.Com.Elec	Cuba
Fernandini Capurro, Luis	Asesor Despacho Ministerial	MINSA	Peru
Ferrero Suarez, Manuel	Director	Min. Comercio Electronico	Cuba
Fierro Gances, Carlos	Asist.Estudios económicos	INDECOPI	Peru
Fiol, Ramón	Gerente	Arthur Andersen	Peru
Fletcher, Finbar	Information Advisor	Min. Trade Trinidad Tobago	Trinidad
Gainza, Angela	Secretaria General	Cam.Comercio Internacional	Peru
Gallego Castillo,Hugo	Director Ejecutivo	IPCE	Peru
Gamarra Postori, Edgardo	Director	INDECOPI	Peru
García Calderón Calisto,	Asesor Informática	Min. Pesquería	Peru
Garland Iturralde, Gonzalo	Presidente Ejecutivo	Con.Eco.Cuenca Pacífico	Peru
Gomez Estremadoyro, Hugo	Ger.Comercial	Telefonica Servicios Internet	Peru
Gonzalez Diaz, Segundo	Coord.Administración	PUCP	Peru
Gonzalez Vigil José	Coor.Programa	PNUD	Peru
Guerra Maturana, Maritza	Coor.Ventas	Telefonica Servicios Internet	Peru
Guevara Lam, Ernesto	Asesor	MITINCI	Peru
Illescas, Javier	Asesor del Ministro	Min. Industrias	Peru
Iriarte Ahon, Erick	Asesor Legal	Red Científica Peruana	Peru
La Rosa Manyari,Rosa	Gerente	Arthur Andersen	Peru
Lavado Chavez, Giovanna	Dir.Asesoria Tecnica	MTC, Telecom	Peru
Leguía Nugent, Juan	Consultor Comercial	Telefonica	Peru
Lituma Muloz, Segio	Gerente Negocios	Informix	Peru
Malca Guaylupo, Oscar	Coor.Negocios Inter.	Univ.Pacifico	Peru
Mannix Arnoldt, William	Dir. Informatica	Camara de Industrias	Costa Rica
Maldonado Marin, José	Consultor Gerencia Desarr.	PROMPEX	Peru
Manrique Aliaga, Carmen	Asesora Legal	Telefonica	Peru
Marco de Diaz Elizabeth	Consultora	PROMPEX	Peru
Martheus, Vanessa	Asist.Operaciones	Telefonica Servicios Fin.	Peru
Mendoza, Gustavo	Dir.Informatica y Racionaliza.	MITINCI	Peru
Mizushima Oshiro, Vanessa	Funcionaria Relac.Empresa.	OSIPTEL	Peru
Montañez Madero, Daniel	Director Ofic.Comer	PROEXPORT	Colombia
Montero, Guillermo	Especialista en Informatica	Inter American Dev. Bank	Usa
Mosto Tello, Erick	Profesional Gerencia Norm.	SUNAT	Peru
Motta Llufire, Victor	Gerente Operaciones	Telefonica Servicios Internet	Peru
Muñoz, Julio	Dir. Organismos Economicos	Min. Relaciones Exteriores	Peru
Navarro Cuadros, Maria	Jefe Operaciones	Telefonica Servicios Fin.	Peru
Neira, Marcelo	Gerente	La Red	Peru
Noriega Febres, Nelly	Asist. Marketing	MEKANO	Peru

Noriega Grippa, Monica	Gerente General	CITO CARGO SAC	Peru
Noto,Gerardo	Project Manager	SELA	Venezuela
O Brien, Peter	Asesor	Secretaria Commonwealth	Inglaterra
Ochoa La torre, María	Asesor Económico	MTC	Peru
Ochoa Vigo, Juana	Sub Director	MITINCI	Peru
Orrillo Huaman, Marleni	Dir.Centro Documentación	INEI	Peru
Ortega, San Martin	Consultor	Min.Industria	Peru
Oscategui Perez, Jorge	Subdir.Prod.Básicos	MITINCI	Peru
Otero Linares, Tito	Gerente Operaciones	AFP Unión	Peru
Pacheco Zevallos, Luis	Prof.Politicas Regulatorias	OSIPTEL	Peru
Palco Zusanibar, Yuri	Asist.Ger.Informatica	ONPE	Peru
Palma Cadenas, Herbert	Subdir.Asuntos Internacionales	MTC	Peru
Parmar, Vijay	Policy Advisor	UNDP	Usa
Perez Benitez, German	Dir.Comercio Electrónico	Telefonica	Peru
Pichilingue, Eduardo	Dir.Rela.Internacionales	ASETA	Ecuador
Pilco Marquina, Rodolfo	Director	IPCE	Peru
Pino Vasquez, Juan	Segundo Secretario	Min.Relaciones Exteriores	Chile
Quichua de Mendez, Olga	Dir.Desarrollo Administrativo	Min.Interior	Peru
Raventós Marcos, Fernando	Socio	Loret de Mora, Venegas y Raventos	Peru
Rico ,Victor	Director General	Comunidad Andina	Peru
Rioja, Omar	Asesor	MITINCI	Peru
RodriguezChirinos,Fernando	Coordinador	Secr.Gen.Comunidad Andina	Peru
Rodriguez Vasquez,Silvia	Abogada	Est.Guzman-Barrón	Peru
Romero Sanjinez, Carlos	Asesor de la Presidencia	CONCYTEC	Peru
Sabando Muñoz, Herlinda	Tecnica de Com. Ext	Min. Comercio Exterior	Ecuador
Salas Guerreeo, Javier	Subger.Servicio Nacional	DHL Internacional	Peru
Salazar Ramirez,Marlowe	Jefe Telematica	Min.Defensa	Peru
Salguero Briceño,Francisco	Coor.Proyecto Internet	SUNAT	Peru
Sanchez Cubas, Victor	Asesor	RENIEC	Peru
Seperack Gamboa,Silvia	Gerente	PROMPEX	Peru
Serrano Lizarzaburu, Veronica	Agente Consultor	Min.Relaciones Exteriores	Usa
Silva Ledesma Tejada,David	Dir.Sistema Nacional	CONCYTEC	Peru
Solis de Salea, Martha	Dir.Nacional Oficina	Red TIPS	Peru
Sotelo Lopez, Carlos	Asesor Tecnico	MTC	Peru
Spitler,Rainer	Ger.Gral.Publico	Telefonica	Peru
Suzuki Yuzuriha,luis	Gerente	Arthur Andersen	Peru
Tapia Rocha, José	Asesor Vice Ministro	MITINCI	Suiza
Tello Canchapoma, Yuri	Consultor	PROMPEX	Peru
Teran Vela, Juan	Asistente Personal	ANDINATEL	Ecuador
Toledo Gonzales Eduardo	Presidente	Camara Peruana Software	Peru
Torres Cava, Egberto	Jef,Proyectos Información	Min.Educación	Peru
Ulloa,Emilio	Dir.Tecnico	INEI	Peru
Valdez Velasquez,Carlos	Jef.Concesiones Telecom.	MTC	Peru
Valdivia Cabrera, Adolfo	Asist.Mercados Externos	PROMPEX	Peru
Valdivia Devoto, Wigberto	Ger.Informatica	RENIEC	Peru
Valdovinos Mullen, Ida	Dir.Politica economica	Min.Relaciones Exteriores	Paraguay

Valeriana Veca, Rossana	Especialista Agroexportación	Min. Agricultura	Peru
Vera, Carlos	Director	CORPECE	Ecuador
Vidal Huaman, Marco	Ger.Sistemas	Telefonica Servicios Fin.	Peru
Vier Panizo, Percy	Ger.e-business	IBM	Peru
Vilca Viviano, John	Jef.Sistemas	PROMPYME	Peru
Wu Yi, Liliana	Coor.Marketing	Telefonica Servicios Internet	Peru
Yanovich Feldman, Alan	Asesor Legal	Comunidad Andina	Peru
Zamora Martinez, Cesar	Asesor-negociador	Min.Economia	Guatemala
Zea Barreto, Marcela	Asesora Viceministro	MITINCI	Peru
Zegarra Yactayo,Arturo	Analista Sistemas	PROMPEX	Peru

2. REGIONAL ROUND TABLE ON ELECTRONIC COMMERCE AND DEVELOPMENT FOR AFRICAN COUNTRIES, NAIROBI, 7-8 OCT. 1999

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Abdalla, Mohamed Ali	Undersecretary Assistant	Min. of Foreign Trade	Sudan
Abilla, Janet		Min.Tourism, Trade & Ind.	Kenya
Adam, Lishan	Regional Advisor on ITCs	UNECA	Ethiopia
Adane, Fanta			Ethiopia
Aigua, Fred		KATO	Kenya
Aliberti, P. Giorgio			Italy
Arebi, Sami Osman	Expert on Trade and Promotion	Min. of Trade and Industry	Eritrea
Asigi, Pamela		Radio Citizen	Kenya
Avedi, Alice		Min. Tourism, Trade & Ind.	Kenya
Baayer, Azziz	Head of Marketing Services	Itissalat Al Magrib	Morocco
Bamuleseyo, Davies	Principle Officer	Min. of Trade & Industry	Uganda
Banya, Joyce	First Secretary	Mission, Switzerland	Uganda
Bararmna, Koulina Boukpessi	Foreing Trade Official	Min. Ind, Com. & Dev.	Togo
Bell, Richard		Telecommunications Service Provider	Kenya
Besa, Fred	Webmaster	Zamnet Communications	Zambia
Biedi, Tespal		Interconnect Ltd.	Kenya
Bruel Rotor, Cecilio Julián	Secretary	Nonciature Apostolique	Holy See
Butkeviciene, Jolita		UNCTAD	Switzerland
Camara,Salematou Bagoura		Min. Com. Industry & SMEs	Guinea
Chasia, Henry		INMARSAT	Kenya
Chegi, John		FlexibleBandwidth Serv. Ltd	Kenya
Chemirmir, Esther		Telkom Kenya	Kenya
Chesang, Benjamin		EPZA	Kenya
Cheserem, Augustine	Chairman	Task Force on E-commerce	Kenya
Dinamani, S.S.		Middle East Bank	Kenya
Esokio, Ben		Min.Tourism, Trade & Ind.	Kenya
Fragoso Neto, Joaquim	Technician, Int. Exchanges	Min. of Commerce	Angola
Gatuni, Julius		Kabade & Mwirigi Brokers	Kenya
Githingi, Morgan Karinge		Min.Tourism, Trade & Ind.	Kenya
Hillgartner, Gunnar	Internet Business Solutions	Africa Online	Kenya

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Hook, Francis		Telecom Forum Africa	SouthAfrica
Houssou, Pascal	Deputy Dir. Foreign Trade	Min. of Commerce	Benin
Kabede, Solomon	Director	Ethiopian Trade Point	Ethiopia
Kabue, George		Insight Technologies Ltd.	Kenya
Kadiri, Ibrahim	Head	Post and Information Techn.	Morocco
Kagika, Josiah		Newspix Service	Kenya
Kagwa, G.W.	Multilateral Org.TreatyDept.	Min. of Foreign Affairs	Uganda
Kainyan, James	Managing Director	JAM KAY Enterprises	Ghana
Kamau, Anna		Min. Tourism, Trade & Ind.	Kenya
Kapacha, Henry		Zambia High Commission	Zambia
Karanja, Michael	Director	National Y2K Center	Kenya
Kareaghi, Hussein		Citizen TV	Kenya
Katondo, Margaret	Administrative Assistant	UNDP Nairobi	Kenya
Kawado, Hideki	Second Secretary	Japanese Embassy, Nairobi	Japan
Kazuzuru, Benedicto	Statician cum Economist	Board of External Trade	Tanzania
Kenana, Lucas		Telkom Kenya	Kenya
Kiio, Elizabeth		Min. Tourism, Trade & Ind.	Kenya
Kiiru, James		Min. Tourism, Trade & Ind.	Kenya
Kinoti, Helen		Telkom Kenya	Kenya
Kirua, Liston		Communication Commission	Kenya
Kisio, Janet		Industrial property Office	Kenya
Kjachoka, George		Min. Tourism, Trade & Ind.	Kenya
Kobou, Jérôme	Technical Counsellor	Min. Ext. Trade Promotions	Côte d'Ivoire
Koech, Elise		Telkom Kenya	Kenya
Koitaba, Oscar		Export Processing Zone	Kenya
Kole, Jane		Min. Tourism, Trade & Ind.	Kenya
Korir, John		Kenya Times Newspaper	Kenya
Kyalo, Victor		National Y2K Center	Kenya
Lokko, Eva			Ghana
Lysák, Branislav	Trade Commissioner	Embassy, Slovak Republic, Nairobi	Slovak Republic
Magnusson, Peter		Swedish Embassy, Nairobi	Sweden
Magoti, Abel		Symposia	Kenya
Maina, Samuel		Capital FM, 98.4	Kenya
Makumba, Lawrence	Senior Assistant Dir. Of Trade	Min. Tourism, Trade & Ind.	Kenya
Mashiba, Venance	Trade Information Officer	Board of External Trade	Tanzania
Masiza, Noel	Principal Trade/Administrative Office	Min. of Industry and Commerce	Zimbabwe
Matsanza, Daniel		Kenya Times	Kenya
Maubert, Pierre-Emmanuel	Head	Economical Expansion Post	France
Mbogori, N.			Kenya
Miururi, Kamande	Managing Director	Africa Online	Kenya
Mlaki, Theofilus	Director	COSTECH	Tanzania
Mucheru, Joseph		Interconnect Ltd.	Kenya
Mugambi, Anthony Kinoti		Telkom	Kenya
Mugo, Mugure Kabugua		Muchekehu Consulting	Kenya

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
		Group	
Mugo, Sheila		Vosma Consultants	Kenya
Muinde, Paul		Kenya Airways	Kenya
Muls, David	Senior Legal Officer, E-Commerce Section	World Intellectual Property Organization (WIPO)	Switzerland
Mumburi, Ulrick		CTI	Tanzania
Mureithi, Muriuki		Summit Stategies	Kenya
Musa, Abdirizak Ali	First Secretary Trade Affairs	Kenya Mission	Switzerland
Muturia, Aida		KTN/Baraza Ltd.	Kenya
Mwangika, John		Investment Prom. Center	Kenya
Mwaniki, John	Director	IRED	Zimbabwe
Nabwana, Lawrence		IDB Ltd.	Kenya
Namutila, Timonah Wanjala		Revenue Authority, Custums Depart.	Kenya
Ndeeri, Lawrence	Director, External Trade	Min. of Tourism, Trade and Ind.	Kenya
Ndirango, G.G.		Min. Tourism, Trade & Ind.	Kenya
Ndoka, Hilda		Min. Tourism, Trade & Ind.	Kenya
Ndong, Eyogho	Deputy Dir. Inf. Systems	Post & Telecommunications	Gabon
Ndungu, Evanson		Bureau of Standards	Kenya
Ngaruiya, Felista		Min. Tourism, Trade & Ind.	Kenya
Njoroge, Francis	Technical Representative	Symposia	Kenya
Njorogi, Charles		CCK	Kenya
Nyirongo, Macleod	Deputy Res.Rep.	UNDP Nairobi	Kenya
Odhiambo, Denise		ARCC	Kenya
Odhiambo, Humphrey		Telkom Kenya	Kenya
Olembo, Norah		KIPO	Kenya
Opondo, Ovino		Nation Media Group	Kenya
Otieno, M.		Min. of Tourism, Trade and Ind.	Kenya
Parmar, Vijay	Policy Advisor	UNDP Africa	USA
Pauell, Melissa		BMI/T Africa	South Africa
Persson, Kaj		Swedish Embassy, Nairobi	Sweden
Ponga, Brice	Head, Telecommunications engineering	Post & Telecommunications Office	Gabon
Qwabe, Bongiwe		South Africa Mission	Switzerland
Rionge, Njeri		Interconnect Ltd.	Kenya
Rusagara, Paul	General Services Director	Min. of Trade	Rwanda
Shege, Paul M.		Kenya Industrial Property	Kenya
Shnoy, Gurudutt		Middle East Bank	Kenya
Shope-Mafole, Lyndall		South African Embassy	South Africa
Sikufweba, Oliver	Director, Trade and Industry	Min. of Commerce,	Zambia
Simaro, Henry	Social Communications	Episcopal Conference	Holy See
Simbiri, Azeneth		Min. of Finance	Kenya
Singh, Khushal	Consultant Physician	Independent	Kenya
Sooklal, Sudir		Trade & Industry	South Africa
Sorieul, Renaud	Senior Legal Officer	UNCITRAL	Austria
Sudo, Yasuhiro	First Secretary	Japanese Embassy, Nairobi	Japan

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Taoufik, Rojbi			Tunisia
Tsilimbiaza, Soanirinela	Director,	Min. of Commerce	Madagascar
Wagacha, Wambui	Editor, Librarian	LISS/KIPPRA	Kenya
Waibochi, John		Virtual City	Kenya
Wane, Abdoul	Program Officer	World Bank	USA
Wane, Sada	General Secretary	Min. of Commerce	Mauritania
Wcewace, Paul		Nation Media Group	Kenya
Workneh, Abebe	First Secretary	Embassy, Nairobi	Ethiopia
Yagambaram, Soobramanien	Trade Analyst	Min. Foreign Affaires & International Trade	Mauritius

3. REGIONAL ROUND TABLE ON ELECTRONIC COMMERCE AND DEVELOPMENT FOR AFRICAN COUNTRIES, SRI LANKA, 25-27 OCT. 1999

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Vijay R. Parmar	Policy Advisor	UNDP	USA
Gothami Indikadahena	First Secretary	Permanent Mission of Sri Lanka in Geneva	Sri Lanka
Basel Al-Jabr	Secretary-General	Saudi National Committee on E-Commerce	Saudi Arabia
Md. Fazlul Haque	Asst.Chief/ITO	Ministry of Commerce	Bangladesh
In Vothana	Chief Co-ordination and International Org.	Ministry of Commerce	Cambodia
Xu Xiaoxi	Director	Trade Point Beijing	China
Young han JOE	Representative	Korea Inst. Of Elec. Commerce	Korea
Samantha Chan	Econ. Planning Officer	Ministry of Commerce	Fiji
Kakhaber Kalmakhelidze	Head of Dept. of Trade and Economic Relations	Min. of Trade & Foreign Econ. Relations.	Georgia
V. Barucha	Executive Director	Trade Point New Dheli	India
Arifin Saleh Lubis	Deputy Director of Intergvt. Relations	Directorate Gen. Of Posts & Telecom.	Indonesia
Hossein Alizazdeh Sangari	Representative	Ministry of Foreign Affairs	Iran
Bolt Tkosobaev	Chief Specialist	Min. of Foreign Trade & Indus.	Kyrgyz Rep.
Ahmed Didi	Managing Director	Focus Computers	Maldives
Vaanchig Dorjgotov	Senior Officer	Trade Point, Mongolia	Mongolia
Shashank Kansal	President/CEO, R/person, Rep.	Digital Telecom Int'l	Nepal
Yousef bin Mohammed Al MASKERY	Legal Auditor	Directorate General of Commerce	Oman
Zamir Ahmed	Econ. Consultant	Ministry of Commerce	Pakistan
Salvador R Villasis	Director/ Manager	Trade Point Cebu City	Philippines
Aloysio Porahiano Ma'ahanoa			Solomon Islands
Tahseen Ahmed Khan	Senior Tech. Director	Ministry of Commerce	India

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Naresh Prasad Pokharel	Section Officer	Ministry of Commerce	Nepal
Tran Quoc Khanh	Govern/Rep	Ministry of Commerce	Viet Nam
Jaechool Lee	Manager, Govern/Rep	Trade Point, Seoul	Korea
Tae Wan Lee	Manager, Internet Busi. Team Govern/Rep	Trade Point, Seoul	Korea
Kng Jian		Trade Point, Beijing	China
Zhou Chunfang	Asst. Manager	Trade Point, Shanghai	China
Peng Guanqin	Inf. Manager	Trade Point, Shanghai	China
Shiu Raj	Manager. Strategic Plan.	Trade Point, Suva	Fiji
Alwyn Didar Singh	Consultant	South Center	Switzerland
Ulf Persson			Sweeden
Gurudath			
Jayantha Fernando			
Nayani Fernando			
David Barnes			USA
Michael Barnes			Japan
Thomas Choong			
Aruna Kulatunga		AgEnt Project,	Sri Lanka
Vindya Tissera		AgEnt Project,	Sri Lanka
Shyamalie Mallawaarachchi		Ayurvedic Drugs Corpn.	Sri Lanka
N.U. Yasapala		BC Computers Ltd.	Sri Lanka
Roshan Irugalbandara		Burns Philp Lanka (Pvt) Ltd.	Sri Lanka
Luxhman Premaratne		Business Solutions Systems Pvt. Ltd.	Sri Lanka
Mehboob Hamza		Ceylon Tobacco Company	Sri Lanka
Shyrone Fernando		Cupid Exports Pvt. Ltd.	Sri Lanka
Cruz Fernando		Cybersoft (Pvt) Ltd.	Sri Lanka
Govind Nangrani		Discover IT (Pvt) Ltd.	Sri Lanka
Rizan Rizvi		E*Trade Private Ltd.	Sri Lanka
Nalaka Sumeda Devendra		EDB - EAD	Sri Lanka
G.V. Chandrasena		EDB - Marketing	Sri Lanka
L.R. Tudugala		EDB - P & P	Sri Lanka
D.L. Rupasiri		EDB - PMD	Sri Lanka
Bandula Jayasinghe		EDB - SME	Sri Lanka
H. Hewaliyanage		EDB - TIS	Sri Lanka
Narandeniya		Effex (Pvt) Ltd.	Sri Lanka
F.X.R. Perera Emmanuel		Estates Agencies & Ser. Ltd.	Sri Lanka
Lionel F.W. Ponnaiah		Growth Lanka (Pvt) Ltd.	Sri Lanka
Santhushi Jayasuriya		Hotel Galadari Bldg.	Sri Lanka
Aslam Shamsudeen		Senid Software Int'L Pvt.	Sri Lanka
Dinesh Saparamadu		Sri Lanka Airlines	Sri Lanka
Ruwan Amarasekera		Sri Lanka Airlines	Sri Lanka
T. Mahendran		John Keells Stock Brokers	Sri Lanka
Samantha Siriwardhane		Kompass Lanka (Pvt) Ltd.	Sri Lanka
Mangala Wickremarachchi		Lanka Com. Serv. Ltd.	Sri Lanka
Rohan Kulatunga		Lanka Com. Serv. Ltd.	Sri Lanka
Roshan Jayatillake		Lanka Com. Serv. Ltd.	Sri Lanka
Sanjaya Weeratunga		Lanka Com. Serv. Ltd.	Sri Lanka

NAME	FUNCTIONAL TITLE	INSTITUTION	COUNTRY
Ananth Vigneswaran		Lanka Global On-Line	Sri Lanka
Rohan Karunaratne		Lanka Orix Factors Ltd.	Sri Lanka
Dharshana Ranatunga	Legal Consultant	Ministry of Int'l Com.	Sri Lanka
Priyantha Jayawardane		Legal Unit, SLEDB	Sri Lanka
Luxman Wijesinghe		Millennium Technologies	Sri Lanka
Niranjan Gorubatham		MTT	Sri Lanka
Padman Mendis		Open Arc Systems Magt.	Sri Lanka
D.K. Hettiarachchi		Open Systems Tech. Pvt.	Sri Lanka
Ajith Amarasekera		Open Systems Tech.	Sri Lanka
Hiranya Gunasekera		People's Venture Investment	Sri Lanka
N.B. Weerasekera		Prudential Technologies	Sri Lanka
H.D. Gunawardena		Ravi Industires Ltd.	Sri Lanka
T. Wijeyanandan		Ravi Industires Ltd.	Sri Lanka
W.M.D.B. Dassanayake		Ravi Industires Ltd.	Sri Lanka
A.S.M.J. Jaan		Seylan Bank Ltd.	Sri Lanka
V.K. Seyone		Seylan Bank Ltd.	Sri Lanka
T.W. Aluthwela		Seylan Bank Ltd.	Sri Lanka
J.T.L.I. Kulatunga		Siva Agencies	Sri Lanka
T. Rajadurai		SLECIC	Sri Lanka
S.M.T. Silva		Slico Cycling (Pvt) Ltd.	Sri Lanka
Ilyas Farook		Sri Lanka Ports Authority	Sri Lanka
P. Lokuge		Sri Lanka Telecom	Sri Lanka
S.P. Undugodage		Sri Lanka Telecom	Sri Lanka
G. Surendran		Sri Lanka Telecom	Sri Lanka
N. Weerasinghe		Telecommunications Regulatory Com.	Sri Lanka
H.M.S. Fernando		Telecommunications Regulatory Com.	Sri Lanka
Ruwani de Silva		Telecommunications Regulatory Com.	Sri Lanka
Menaka Pathirana		Union Assurance, Manager	Sri Lanka
S. Gnanendran		Union Bank	Sri Lanka
Chanaka Gunawardena		World Express (Cmb) Ltd.	Sri Lanka
A.M.S. Fernando		ITMIN	Sri Lanka
P.C. Rupasinghe		Sri Lanka Telecom	Sri Lanka
Arjuna Kodisinghe		Golden Key Credit Card Co.	Sri Lanka
Duminda Somanayake		PC World	Sri Lanka
Anusha Kirubaharan		NDB	Sri Lanka
Shehara de Silva		Cambridge Technology	Sri Lanka
Prasath Nanayakkara		Air Express Int'l	Sri Lanka
Niranjan Wijeyanathan		Keells Business Systems	Sri Lanka
Reza Rafiq		EDS	Sri Lanka
Indika de Alwis		EDS	Sri Lanka
Niroshan Santhiamohan			Sri Lanka
Tora Galway			Sri Lanka

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Glossary

A

Asian-Pacific Economic Cooperation (APEC)

Formed in 1989, it is the primary regional vehicle for promoting open trade and practical economic co-operation. APEC's Electronic Commerce steering group met on June 27-28 1999 in Auckland New Zealand; in order to review the legal foundations for Electronic Commerce and as well as other issues related with electronic commerce within the APEC member countries. Regarding small and medium sized enterprises (SMES) APEC organises Electronic Commerce Seminars to help them understand the benefits of doing business electronically. http://www.apecsec.org.sg

ASYCUDA (Automated System for Custom Data)

Computerised customs management system which covers most foreign trade procedures. The system handles manifest customs declarations, accounting procedures, and transit and suspense procedures. This *software* was developed by *UNCTAD*. http://www.unctad.org and http://www.wcoomd.org. See: Kyoto Convention.

Authorized Payment Agent (APA)

Any individual or entity that is appointed to be a representative payee or fiduciary under the national regulations of an agency.

Automated Clearing House (ACH)

Normally, a nation-wide payment and collection network which provides for the electronic distribution and settlement of funds.

B

Bar codes

A series of lines of various widths and spacing that can be scanned electronically to identify and track products as they are manufactured, transported, distributed, stored and sold.

Bill of lading

Transportation document that is the contract of carriage between the shipper and carrier. It provides a receipt for the goods the shipper tenders to the carrier and, in some cases, shows certificate of title.

Browser

Generic term for *software* programs that retrieve, display, and print information on the *World Wide Web.* More generally, it is a software application used to locate and display Web pages.

C

Carrier

A firm that provides transport services for the carriage of goods. This includes airfreight companies, maritime shipping companies, trucking and railroad companies, etc. Most such companies specialise in the provision of transport functions only, leaving other functions on the supply chain to other firms. Some, such as integrated carriers, perform a wider range of functions.

Certificate

In SET, a certificate is a public key that has been digitally signed by a trusted authority (your financial institution) to identify the user of the public key. SET uses certificates to encrypt payment information.

Certificate Authority

A service provided by a bank (or its designate) that digitally signs public keys sent to it by a web browser or the merchant's server software.

Certification Authority

A secure third party organization or company that issues digital certificates used to create digital signatures and public key pairs. The role of the certificate authority in this process is to guarantee that the individual granted the unique certificate is in fact who he claims to be. Certification authorities guarantee that the two parties exchanging information are really who they claim to be.

Copyright

The right to retain or sell the rights to an artistic work. Copyright is a form of protection to the authors of "original works of authorship" including literary, dramatic, musical, artistic, and certain other intellectual works. This protection is available to both published and unpublished works. http://www.wipo.org

Credit Card

An electronic access device the use of which results in payments authorization based on a credit limit given by the Credit Card Company or it's representative bank to a cardholder. The settlement takes place later on either through consequent invoicing of the client or debiting of a bank account authorized by the cardholder.

Cryptography

Practice of digitally "scrambling" a message using a secret key or keys. These keys are used to unscramble or decrypt the message. Cryptography can be broadly classified into symmetric-key systems that use a single key that both the sender and recipient have, and

the public-key systems that use two keys, a public key known to everyone and a private key that only the recipient of messages uses. http://www.oecd.org

See Encryption , Public key System,

D

Debit Card

An electronic access device the use of which results directly in a debit part of the cardholder's account.

Digital ID

See Certificate.

Digital signatures

Digital codes that can be attached to an electronically sent message to uniquely identify the sender. Like written signatures, these are a method of authenticating the source of a document and/or its author and are the most common approach to authentication.

Unlike written signatures, a digital signature binds the content of a message to the signatory in such way that if one bit of the message changes on the way, the signature will not verify at the other end. http://www.wipo.org and http://www.uncitral.org

See Annex: UNCITRAL Model Law on Electronic Commerce

Digital Wallet

In the online world the digital wallet is installed as a plug-in to your web browser. The digital wallet stores a credit or debit or prepaid card number and the owners' shipping information. The owner also needs to know the secret "password" to use what's inside. The wallet implements the "encryption" that makes SET secure.

Domain Name

A unique name which represents each computer on the Internet.

The Domain Name System converts the domain name requested by an Internet user into an IP address. The location of the machine with this *IP address* is known and the information being requested can then be found. Domain names are used in *URLs* to identify particular Web pages. Because the Internet is based on IP addresses, not domain names, every Web server requires a Domain Name System (DNS) server to translate domain names into IP addresses. http://wipo.org and http://www.icann.org

E

EDI — Electronic Data Interchange-

The purpose of EDI is to take information from one company's computer application and place it in the computer application of another company. These two applications normally would not be able to exchange data automatically because they use incompatible data formats. EDI gives them an intermediate data format.

See: EDIFACT

Electronic bills

One of the digitized payments documents conforming to the requirements of traditional bills and containing encrypted electronic signatures.

Electronic Cash System

Digital data representing a certain monetary value.

There are two types of electronic cash, namely, those stored on the users' hard disks (*software* type) and those stored on IC chips (*hardware* type).

In order to protect anonymity, e-cash uses the "blind signature" procedure; the e-cash coins are not created at the bank but by the e-cash software installed on the customers PC.

Each e-cash transaction is created in such way that it has its own serial number and is sent to the bank encrypted.

Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT)

The international standard for *EDI* messages. EDIFACT, also known as UN/EDIFACT, is one of the two international standards describing the syntax of EDI transmissions. EDIFACT is administered by a working party of the United Nations Commission for Europe (UN/ECE). http://www.unece.org

Electronic Funds Transfer (EFT)

A transfer of funds initiated through an electronic terminal, telephone, computer, or magnetic tape. The term includes, but is not limited to, Automated Clearing House (ACH) transfers, national payments systems transfers, and transfers made at automated teller machines and point-of-sale terminals or due to credit and debit and prepaid card payments.

Electronic Money

The means of retail payments executed over Internet, which leaves other traditional electronic payments outside of its scope. Alongside with most commonly used smart card the term include: e-cards, trade cards, traditional credit, debit and stored value cards, as well as e-cash, digicash, digiwallet, e-credit, e-loans etc.

Electronic payments system

An array of institutions and mechanisms ensuring the cash flow through electronic communications and timely provision of credit and settlements of debts at much less than traditional system could provide costs.

Electronic Signature

See Digital Signature

Electronic Transfer Account (ETA)

A low-cost Treasury-designated account which will be made available to individuals who receive Federal benefit, salary, wage, and retirement payments.

Encryption Algorithms

Means of disguising information using mathematical rules known as algorithms. It takes a message from plain text and puts it into cypher-text, which is non-readable, by adding characters to the message. Decryption brings the message back to a readable form. The algorithms perform the data encryption, which is programmed into a specialized computer. A

key is used to personalize an algorithm. There are two different keys: one is a public key that the sender uses to encrypt the data and the other is a private key used to decrypt the data that is used by the receiver of a message.

Express services

A service that is based on predictable, published transit times. It includes a service guarantee and may have tracking and tracing capability.

Extranet

A Website that links businesses to customers, suppliers, etc. for electronic commerce. These sites usually provide more customer-specific information than a public site and may have security devices such as passwords for a user to gain access to more sensitive information.

F

Financial Agent

A financial institution that has been designated by the Ministry of Finance as a Financial Agent for the provision of payments services.

Financial institution

Include commercial banks, savings banks, credit unions, savings associations, foreign bank branches, investment banks, financial brokers and agents, insurers, reinsurers, financial companies, lessors, factors, forfeiters, etc.

Freight forwarder

An intermediary who accepts shipments from shippers and consolidates them into larger shipments to tender to carriers.

G

Gateway

A combination of *hardware* and *software* that link two different types of networks. This may also be a device that passes packets from one network to another network in their trip across the Internet. In a company network, a proxy server acts as a gateway between the internal network and the Internet.

H

Hardware

Physical components of a computer such as monitor, mouse, printer, system unit, disk drive and keyboard.

Heterogeneity

Services that are not standardized have inconsistent patterns of performance, although training and standardization help to increase consistent production stats. The positive aspects are interpersonal skills and individual performance.

Homepage

The introductory or menu page of a Website. This page usually contains the site name and a directory of its contents. All the other pages on the server are accessible by following *links* from the home page.

Hypertext Markup Language (HTML)

This language is used to create documents for the *World Wide Web*. These documents are referred to as hypertext documents. These documents are regular documents that are marked with special tags that give commands that direct size, shape, colouring, and placement of text, graphics, sound and motion of the published document.

I

Integrated carrier

A firm which offers door-to-door delivery of shipments, most commonly small packages. It provides all services from pickup, transport and final delivery. The integrated carrier normally owns or operates its own transport and related facilities such as aircraft, warehouses, terminals, etc.

Intellectual Property

Comprises two main branches: industrial property, which is chiefly in inventions, trademarks, industrial designs and appellations of origin; and *copyright*, chiefly in literary, musical, artistic, photographic and audiovisual works. http://www.wipo.org

See : WIPO, Copyright, Domain names.

International Telecommunication Union (ITU)

An intergovernmental organization, within which public and private sectors cooperate for the development of telecommunications. It adopts international regulations and treaties governing all terrestrial and space uses of the frequency spectrum within which countries adopt their national legislation and develops standards to facilitate the interconnection of telecommunication systems on a worldwide scale regardless of the type of technology used.

It carries out activities in 3 main fields: radiocommunication, standardization and development. The ITU also fosters the expansion of telecommunications services and infrastructure in developing countries by recommending medium-term policies and strategies to national administrators. http://www.itu.org

Internet

Technically it is a network of networks, all running the TCP/IP protocol suite — a protocol being a set of rules that specifies how a network is to handle the movement of messages and how it should handle errors that occur during message handling — connected through gateways, and sharing common names and address spaces.

The Internet began as a military research project in the early 1970s. The United States Defense Department implemented a network called ARPAnet, that was designed so that even if part of its physical structure were destroyed, information could still be sent to any remaining destination.

See : Internet Protocol (IP) address, Internet Service Provider, Internet Society

Internet Protocol (IP) address

A unique number which is used to represent every single computer in a Network. All computers on the Internet have a unique IP address.

Internet Service Providers (ISPs)

Companies that charge start up and monthly fees to users and provide them with the initial host connection to the rest of the Internet, usually via dialup connection. These direct access companies focus on low-cost unrestricted Internet access, and the design and maintenance f World Wide Web home pages for their customers.

Internet Society

Non-governmental international organization for global co-operation and co-ordination for the Internet and its "internetworking" technologies and applications. The Society's members are bound by a common objective, which is maintaining the viability and the global scaling of Internet. http://www.isoc.org

Intranet

A private Internet operating on a company's internal network (which exploits the popular and low-cost Internet to gain a strategic advantage over competitors, cut costs, and improve operational effectiveness.) An Intranet has three specific features that Internet lacks: speed, security and control. Many companies use the Intranet for publishing corporate documents, phone directories, and employee information such as benefits, job posting and bulletins.

IP (Internet Protocol)

Connectionless, best effort packet-switching protocol. "Best effort" means each packet is separately evaluated to find the best route available at the moment of sending the packet.

K

Kyoto Convention

International convention on the simplification and harmonization of Customs procedures. It consists of 31 annexes, each containing basic principles for Customs processes such as clearance for home use, exportation, transit, postal traffic and passenger facilitation. The World Customs Organization is presently revising the Kyoto Convention to update the annexes and delete provisions which may be obsolete. Among the revisions are inclusion of information technology, electronic commerce and risk assessment methodology as integral to re-engineering Customs processes and simplifying procedures.

L

Link

A word, phrase, graphic or address that when clicked on loads other information about the linked phrase or loads a related Web page. It usually appears on the screen in underlined, bold or coloured form.

Logistics

The process of planning, implementing and controlling efficient and effective flow of goods, services and related information on a supply chain. Companies increasingly employ information technology to carry out their logistics functions. Logistics functions are closely related to supply chain management.

O

Online banking

The provision of banking services to the client through Internet.

Online brokerage

The execution of client's orders, other related communications and direct buying and selling of various financial instruments including shares and bonds through Internet.

Online insurance

The conclusion of an insurance or reinsurance contract through Internet.

Order fulfilment

Functions that ensure that a product gets to the customer at the right time and in good condition. This includes picking, packing, shipping, delivery and handling returns.

P

Public key Encryption

This *encryption* method requires two unique software keys to for decrypting data, one public and one private. Data is encrypted using the published public keys and the unpublished private keys are used to decrypt the data.

S

SADC

Southern African Development Community

Secure Electronic Transaction (SET)

A protocol which is an open industry standard developed for the secure transmission of payment information over the Internet and other electronic networks.

Secure Socket Layer (SSL)

A standard that encrypts data between a Web browser and a Web server. SSL does not specify what data is sent or encrypted. In an SSL session, all data sent is encrypted.

Service Provider

See Internet Service Provider

Smart Card

A multipurpose electronic card embodying the virtues of credit, debit and cash (stored value) cards. Instead of magnetic strips this card contains a microprocessor chip which through a special software attached or preinstalled in the PC hard disc could permit the card holder not only to have the above functions but also to add personal data, possibility to communicate, accumulate various benefits for travel or other purchases, etc.

Software

Electronic instructions and information for a computer including everything from computer's operating system to computer games (programs and applications).

Supply chain

The channel through which goods pass from the point of origin to the point of final sale to customers. It includes all related activities on the chain, that is production, ordering, warehousing, wholesale, distribution and retailing. Firms employ supply chain management in order to shorten the travel time associated with both finished goods and work-in-progress goods and to reduce inventory costs.

T

Third party logistics provider

An outside firm that performs all or part of a company's logistics functions, such as order picking, warehousing, packaging, shipping and handling returns. Companies use third party logistics firms in order to allow themselves to focus their attention on their core business while using expert partners to optimise their logistics functions and to reduce overheads.

Trade Point

Centres for facilitating trade transactions gateways to global networking and sources of trade related information. Trade Points allow traders to complete transactions using services provided by all potential agents involved in trade: customs, freight-forwarders, banks etc…and bring together all foreign trade participants either physically or virtually . They are also part of a global network (GTPNet), which facilitates communications across borders, provides easy access to electronic database and opens doors to electronic commerce. http://www.unctad.org

U

URL (Universal Ressource Location)

Essentially, the address and the path used to find a particular site on the Internet, which specifies a particular site, page, graphic or document.

UNCITRAL

United Nations Commission on International Trade Law, established by the General Assembly in 1966. The Commission has the general mandate to further the progressive harmonization and unification of the law of international trade . The Commission adopted in 1996 the "UNCITRAL Model Law on Electronic Commerce".

http://www.uncitral.org/english/texts/electcom/ml-ec.htm

V

Virtual Sales Slip

A detailed information on a financial transaction, which is generated by the merchant's online store and downloaded to your digital wallet. Typical items contained in the virtual sales slip are confirmation of your order, shipping details, tax (if applicable), and total amount of sale.

W

Waiver

Provisions under which certain payments are exempted from the mandatory requirements in a process of a collection or a payment.

Website

Place on the *Internet* that is run by an individual, a company or an organization.

It is a group of pages interconnected, whose nature may vary: (commercial, educational, or personal) as well as its size, that includes *homepages* and multiple web pages all having unique Ids or *URLs*.

See: WWW

World Intellectual Property Organisation (WIPO)

An intergovernmental organization responsible for the promotion of the protection of *intellectual property* throughout the world. This organization administers over 16 multilateral treaties dealing with the legal and administrative aspects of intellectual property. WIPO's work involves the development of new international treaties dealing with intellectual property and an extensive program of co-operation for development under which technical assistance is extended to developing counties.

Activities and initiatives in the field of electronic commerce:

– **Commercial law:** Wipo's Arbitration and Mediation Center has developed an Internet-based, on-line dispute-resolution system that can provide a neutral and rapid way of

resolving disputes arising out of electronic commerce without the physical movement of persons and things.

– Access and use of the information infrastructure: approval by member states of WIPO of project to construct a dedicated global information network linking all industrial property offices of the world.

– Domain names system: WIPO has initiated an international process to develop recommendations regarding certain intellectual property issues related with domain names, including dispute resolution.

http://www.wipo.org

World Trade Organisation (WTO)

An international body which deals with the rules of trade between nations, and whose agreements provide the legal ground-rules for international commerce. These agreements are binding contracts which are signed by nations in order to keep their trade policies within the agreed limits and which deal with trade in goods, services, and intellectual property.

Although the agreements are negotiated and signed by Governments, the goal is to help producers of goods and services, exporters and importers conduct their business.

WTO's activities and initiatives in the field of Electronic Commerce:

– protection of privacy and personal data: The General Agreement on Trade in Services article XIV enables Members to take measures necessary to protect the Privacy of individuals in what relates to the processing and dissemination of personal data, and the confidentiality of individual records and accounts.

– electronic payment: The GATS provides a legal framework for all trade in financial services, including those made electronically.

– trade facilitation and market access: In the Declaration on Global Electronic Commerce adopted in 1998, WTO members agreed to refrain from imposing custom duties on electronic transmissions.

http://www.wto.org

WWW – World Wide Web

A collection of information located in many Internet servers that can be accessed with a browser or by navigating via hyperlinks. It is made up of web pages created in HTML and is viewed with a web browser like Netscape or Microsoft Internet Explorer. An URL is also needed for access. The WWW is the fast-growing, most popular section of the Internet that was invented in 1989 by Tim Berners-Lee at the European Particle Physics Laboratory (known CERN) in Geneva, Switzerland.

List of Abbreviations

ACCT	Agence pour la Coopération Culturelle et Technique (Francophonie) (Agency for Cultural and Technical Cooperation)
ACIS	Advance Cargo Information System
ACIS	Advance Cargo Information System
ADB	African Development Bank: also AfDB
ADB	African Development Bank: also AfDB
AFRALTI	African Regional Advanced Level Telecommunication Training Institute
AISI	African Information Society Initiative
BOT	Build-Operate-Transfer
BRMA	Brokers & Reinsurance Markets Association
CAPAS	Co-ordinated African Programme of Assistance Services
CEDEAO	see ECOWAS
CETA	Centres of Excellence in Telecommunications Administration
CGE	computable general equilibrium model
CITI	Classification internationale type, par industrie, de toutes les branches d'activité Economique
COFACE	Compagnie Française d'Assurance Crédit
COMESA	Common Market for Eastern and Southern Africa
DSB	Dispute Settlement Body. (WTO)
EBP	electronic bill presentment
ECA	Economic Commission for Africa; also UN-ECA
ECE	Economic Commission for Europe
ECOWAS	Economic Community of West African States (in French, CEDEAO)
EDI	Electronic Data Interchange
EDIFACT	electronic data interchange for administration, commerce and transport
ESMT	Ecole supérieure multinationale des télécommunications
ESMT	Higher Multinational School for Telecommunications
FCC	Federal Communications Commission (USA)
GATS	General Agreement on Trade in Services
GATT	General Agreement on Tariffs and Trade
GMPCS	global mobile personal communications systems
GTAP	Global Trade Analysis Project
HOS	Hecksher-Ohlin-Samuelsson (model)
HRD	human resource development
HSBC	Hongkong Shanghai Banking Corporation
IANA	Internet Assigned Numbers Authority
ICANN	Internet Corporation for Assigned Names and Numbers
ICTs	information and communication technologies
IGAD	Intergovernmental Authority on Development
INRIA	Institut national de recherche en informatique et automatique (French institute of information technology and automation research)

IPCE	Instituto Peruano de Comercio Electronico
IPOs	initial public offering(s)
ISIC	International Standard Industrial Classification of all Economic Activities.
ISOC	Internet Society
IVANS	Insurance Value Added Network Services
LANs	Local Area Networks
LDCs	least developed countries
LMI	Lockheed Martin Intersputnik
NAIC	National Association of Insurance Commissioners
NICI	national information and communication infrastructure
OECD	Organisation for Economic Co-operation and Development
OP	online procurement
ORSTOM	Office de recherche scientifique et technique d'outre-mer (Office for Scientific and Technical Research Overseas)
PKI	public-key infrastructure
PSDNs	packet switched data network(s)
PTOs	public telecom operators
RAA	Reinsurance Association of America
RASCOM	Regional African Satellite Communications Organization
ROW	rest of the world
S.W.I.F.T.	Society for Worldwide Interbank Financial Telecommunication
SADC	Southern African Development Community
SET	Secure Electronic Transaction
SITC	Standard International Trade Classification
SMEs	Small and medium-sized enterprises
SWIFT	Society for Worldwide Interbank Financial Telecommunications
TP	Trade Point
TTP	Transport Technology Publishing
UAE	United Arab Emirates
UN/CEFACT	United Nations Centre for the Facilitation of Procedures and Practices for Administration, Commerce and Transport. (in UN-ECE)
UNCITRAL	United Nations Commission on International Trade Law
UN-ECA	United Nations Economic Commission for Africa
UN-ECE	United Nations Economic Commission for Europe
UNITAR	United Nations Institute for Training and Research
UNTPDC	UNCTAD Trade Point Development Centre
VPNs	virtual private network
VSAT	very small aperture terminal
W3C	World Wide Web Consortium
WCO	World Customs Organization
WIPO	World Intellectual Property Organization
WISe	World-wide Insurance Electronic Commerce
WTCA	World Trade Centers Association
WTO	World Trade Organization
XML	eXtensible Markup Language

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