Electronic Commerce and CARICOM Economies

Strategic Considerations for Governments

Prepared for the Caribbean Regional Negotiating Machinery
Barbados

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EXECUTIVE SUMMARY

The Challenge of the Digital Economy

In the old economy, information flow was physical; in the new economy information flow is digital. The Internet and the World Wide Web (Web) have totally revolutionized the way people obtain information, shop, socialize, entertain themselves and communicate with others. It has also ushered in a digital age in which virtually every major organization or firm is trying to position itself to take advantage of this new medium. The countries that stand to benefit most from the Internet are those that have the telecommunications infrastructure and the skilled personnel to continue to innovate and create new value. The Internet has created the environment for online commerce, or electronic commerce (e-commerce) and electronic business (e-business). It is also increasingly being used by governments to deliver their services to the public through online information and transaction sites.

E-commerce may be simply defined as the production, distribution, marketing, sale or delivery of goods and services by electronic means. CARICOM governments should see e-commerce as part of a broader process of economic, social and cultural change, characterized by the globalization of markets and the shift toward a global economy based on knowledge and information. Given the appropriate policy environment, e-commerce has the potential to act as a significant source of jobs and growth and increases in consumer choice. It also brings new challenges but the opportunities for increased efficiency and opportunity for governments, the private sector and individual citizens outweigh the costs at the national ***and*** regional levels.

A rapidly evolving aspect of the Web is e-government. In a similar manner that the Internet made companies more efficient and able to respond to consumer needs, the Web is leading to a rethinking of how governments deliver services. While e-commerce remains very tiny compared to traditional merchandise trade, its economic benefits are changing the way companies operate and in the long run can become a significant part of overall global trade.

A troubling fact of this new digital world is that much of the new technologies and systems are being developed and utilized in the industrial countries, particularly OECD economies, and developing countries (LDCs) are rapidly being left behind. CARICOM countries have to guard against this and find mechanisms to facilitate universal access to the Internet by all citizens.

Several Caribbean governments have expressed interest in bringing their economies into the digital age. This calls for rapid policy changes to provide the physical infrastructure and the regulatory environment for information technology and e-commerce to grow in the Region. Indeed, in most government offices, e-mail is only available to a select few and computers are still a scarce commodity in the public service. The low rate of diffusion of computers and Internet access in the Region is a major constraint to the development of e-commerce. Governments need to focus their efforts on improving computer literacy by developing policies that encourage the rapid diffusion of computers in society.

All CARICOM governments should put in the necessary administrative infrastructure to ensure that data on key indicators of the digital economy are collectable and collected. In particular, they should attempt to compile national statistics on computer literacy and use, Internet access by households and businesses and number of ISPs, Internet hosts, Web servers, among others.

Opportunities and Challenges re E-Commerce

Rapid growth in the development and application of electronic commerce has raised a number of policy issues, including development and access to the global Internet infrastructure, taxation, content regulation, privacy, security, protection of intellectual property, and jurisdictional issues. More importantly, for the CARICOM region, the Internet in general and e-commerce in particular requires new thinking by governments to harness the technology for the economic benefit of everyone.

E-commerce can provide significant benefits in traditional sectors such as tourism, music and entertainment and also opens up an almost limitless range of possibilities for increasing exports in non-traditional exports. However, Caribbean businesses and citizens are very slow to embrace the new medium and need to be educated about the potential for using e-commerce to expand their horizons. E-commerce has great potential for SMEs in the region but awareness is low and the cost of Internet access is too high. The banking sector is very reluctant to provide capital for e-businesses or to process online credit transactions. It is also very difficult for SMEs to obtain merchant accounts so startup e-commerce firms are seriously constrained. For the moment, anyone doing online transactions is forced to use foreign application service providers.

The telecommunications sector plays a critical role in e-commerce and governments must introduce competition in this sector in order to benefit from cheaper and more efficient service, and new technologies. The rapid pace of technological change in telecommunications and information management is leading to new applications for e-commerce every year. High-speed Internet access or "broadband" at transmission speeds of 1 to 2 million bits per second (2 Mbs) is making rapid transmission of full colour and full motion video possible. And this is creating a wave of new applications for the Web and increasing the possibilities for e-commerce.

The small size of CARICOM firms makes it difficult for those that sell low value products through e-commerce to distribute their products overseas so it may be necessary for governments to set up regional staging facilities in major market such as the US and Europe.

Several Caribbean states have attempted to examine issues relating to e-commerce and some have passed or are in the process of considering legislation to facilitate this new means of doing business. Regional cooperation may be necessary to ensure that the national approaches to issues such as privacy, digital signatures, security, among others, are compatible, and that standards are similar.

While issues such as privacy and consumer protection are not trade policy issues per se, they are critical to electronic commerce because if they are not properly addressed, consumers will not embrace electronic transactions with enthusiasm. The best approach is for industry to find solutions to problems as they emerge. Perhaps all that governments need to do is to ensure that national regulations and legislation cover privacy protection on the Internet and all telecommunication networks, including satellite or broadcast media. Nevertheless, at the regional level, it may be useful to clarify the kinds of issues that governments agree should be addressed in the consumer protection area

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Similar to concerns about privacy, the other areas of consumer protection that relate to electronic commerce are also being addressed through either technological solutions or new services such as authentication. However, the right to redress in the event of dishonest or fraudulent claims by either buyers or sellers must be ensured. CARICOM states may need to address these issues perhaps with some amendments to existing laws to facilitate the technicalities of a non-physical medium such as the Internet.

Taxation Issues

International business has suggested that tax neutrality should be the guiding principle in government policy towards electronic commerce. Taxation of electronic commerce involves complex issues that may not seem to have trade policy implications at first glance. But if taxation in different countries leads to inconsistency and unpredictability, it could frustrate and constrain commerce in the digital medium. The potential loss of tax revenue as a result of e-commerce is of particular concern to CARICOM governments. The Region must work internationally to address taxation issues as electronic trade increases. As a first step, governments should continue the moratorium on the collection of customs duties and monitor the further development of this medium of commerce until better mechanisms can be developed to address taxation issues.

WTO Issues and E-Commerce

There is a very robust economic case for a liberal approach to both national and international regulation of electronic commerce. A liberal approach should both stimulate growth and development of the enabling infrastructure and facilitate the production and consumption of a wide array of products (goods and services) that can benefit either in whole or in part from electronic data transmission in its production, distribution, or consumption.

The application of some of the disciplines of the General Agreement on Trade in Services (GATS) affecting the quality and extent of market access can be more complicated than for more conventional transactions. While it is clear that GATS disciplines and commitments apply in each instance, regardless of the means by which the product is delivered, the capacity to apply these disciplines may be more difficult in the case of the electronic version. In many instances the use of electronic commerce would seem to make it easier to access a market. Whether CARICOM governments would want to address this technological liberalization of markets remains an open question. From a broad consumer welfare perspective, in instances of conflict, the solution would seem to lie in liberalizing the more conventional form of delivery rather than in restricting the electronic version.

GATS Articles VIII and IX, as well as the Reference Paper annexed to the telecommunications schedules of some Members, address *competition issues.* Members must ensure that monopolies and exclusive suppliers do not abuse their positions in domestic markets and frustrate the most-favoured-nation (MFN) principle. The Reference Paper lists a series of principles related to competitive safeguards, interconnection, universal service, transparency of licensing criteria, independent regulators, and objective, timely, transparent, and non-discriminatory use of scarce resources. But its implementation will require more explicit guidelines regarding the products and services that fall under its ambit and any changes in domestic regulation required to support its pro-competitive regulatory principles.

The current WTO rules on Trade-Related Intellectual Property Rights (TRIPs) already provide adequate protection for intellectual property rights; the problem is that the technological means of digital delivery and copying make enforcement very difficult. What may be needed at the national level is the modification of domestic copyright laws to reflect electronic transmission and storage of digital work such as software, music, books, and similar products or services. In addition to all the earlier copyright and trademark and other treaties that the TRIPs Agreement requires that WTO members uphold, the World Intellectual Property Organization (WIPO) adopted the Copyright Treaty and the Performances and Phonograms Treaty in December 1996. All CARICOM governments should promptly ratify and implement these treaties and pay special attention to the challenges and opportunities of the digital environment.

FTAA Discussions on E-Commerce

The FTAA Joint Government-Private Sector Committee is studying the issues and gathering information on the status of e-commerce and Internet readiness in FTAA countries. The Committee has done a commendable job in proposing a series of useful recommendations to FTAA Ministers to facilitate e-commerce. The task is now up to CARICOM governments to get action on those recommendations that are particularly relevant to the development of e-commerce in the Region.

Governments should take advantage of the opportunity to learn from the FTAA discussions on best practices and the sharing of national experiences regarding e-commerce. In addition, they should encourage greater participation by the Caribbean private sector. In order to properly represent its interests, the Region should table papers for discussion in the Committee. Furthermore, as a group, CARICOM should carefully identify which specific areas of e-commerce are in their strategic interest and pursue them in a focused way in the FTAA and all forums.

GATS Negotiations and E-Commerce

The WTO recently launched new negotiations on trade in services under the GATS. Many of the services involved with e-commerce are likely to be discussed during these negotiations. In traditional trade negotiations, countries make offers to, and requests of, each other in relation to the liberalization of trade in certain sectors. Electronic commerce is not, in itself, a trade "sector". Rather, it is a means of doing business and delivering goods and services that involves a wide variety of new and traditional supporting services. As a result, questions arise as to the best way to handle e-commerce related activities within the new GATS negotiations.

The Region should examine the e-commerce value chain and the cluster of related services that are important to CARICOM. It is also necessary to identify the services that will allow Caribbean firms to take advantage of e-commerce in overseas markets and concentrate on those in international negotiations. CARICOM states should also ensure that WTO Members take account of the revenue and other fiscal implications of e-commerce for them. The work done in UNCTAD and the WTO Committee on Trade and Development pertaining to developing country interests is important in this regard.

In all international negotiations, CARICOM should seek to reduce the existing restrictions on export of state-of-the-art encryption technology by developed countries. This is important because technology relating to encryption and security of transactions is critical to the development of e-commerce.

Electronic Commerce and CARICOM Economies: Strategic Considerations for Governments

INTRODUCTION

The Internet and the Digital Economy

It is fast becoming evident that the developed economies have changed from economies based on steel, automobiles and other heavy industry to new knowledge-based economies driven by information technology, computers and telecommunication networks. This is what is referred to as the paradigm shift in terms of production and wealth generation towards the rapidly evolving "digital economy." In order to appreciate the implications of the new digital economy created as the result of revolutions in computing and communication technologies, consider the case of Microsoft. Although it is a company valued at about US$340 billion, its greatest assets are not in land, buildings or physical stock but in ideas, inventions and innovations – people, not capital. Microsoft's wealth is in its human resource and in its use and development of information technologies. Much of the output of Microsoft and other leading-edge high technology firms (such as Nortel, Cisco, etc.) is transported by telecommunications networks, particularly the Internet.[1]

In the old economy, information flow was physical: cash, cheques, invoices, bills of lading, reports, face-to-face meetings, analogue telephone calls or radio and TV transmissions, among others. In the new economy, information is fast becoming digital; it is reduced to "bits" stored in computers that travel at the speed of light through telecommunications networks. In this new regime, the creation of wealth is based on knowledge-generation and the application of technology to everything we produce and how we produce it. At the centre of the fast emerging global digital economy is the Internet. In the past, many large companies operated private networks to run their internal operations; but the Internet is a vast, constantly expanding network of networks that is publicly accessible. Furthermore, it is fast becoming a high-bandwidth Web of communications systems that will transport huge volumes of text, sound, images and video in and out of businesses, factories, homes, hospitals, schools and government offices. It is truly the exemplar of the "information highway" and has an apparently limitless possible amount of future applications.

The Internet has totally revolutionized the way people obtain information, shop, socialize, entertain themselves and communicate with others. It has also ushered in a digital age in which virtually every major organization or firm is trying to position itself to take advantage of this new medium. The countries that stand to benefit most from the Internet are those that have the telecommunications infrastructure and the skilled personnel to continue to innovate and create new value. As a United States (US) Government report pointed out, "the Internet is both an effect and a cause of the new economy. It is, in part, a product of the powerful technological and economic changes that are shaping a new epoch of economic experience."[2]

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1 The Internet was originally created by the US Department of Defense and was launched as a packet-switching system in 1969 so that military research sites could share information and give access to computers elsewhere. It has since become a public network of networks that allows global access to computers and databases as diverse as can be imagined.

2 U.S. Department of Commerce, *Digital Economy 2000,* June 2000, p. 4.

The exponential growth of the Internet has become a cliché but much of the digital economy depends on the Internet. As the International Telecommunications Union (ITU) pointed out, while it took the telephone close to 75 years to reach 50 million users, in only four years the Internet has reached the same number. Furthermore, although the number of international telephone carriers reached more than 1,500 in 1999, the amount of Internet Service Providers (ISPs) around the world already totals more than 17,000.[3] The global nature of the Internet on which the World Wide Web[4] (WWW or the Web) operates, has suddenly created the largest market and forum in history and the more people join the network, the more important it becomes for business and trade.[5] The Internet has created the environment for online commerce, or electronic commerce (e-commerce) and electronic business (e-business). It is also increasingly being used by governments to deliver their services to the public through online information and transaction sites.

What is Electronic Commerce?

In its widest context, electronic commerce can include any kind of commercial transaction made using digital technology in open networks like the Internet, closed networks such as electronic data interchange (EDI), and credit and debit card transactions.[6] The more common recent usage of the term refers to transactions conducted via Transmission Control Protocol/Internet Protocol (TCP/IP) or, loosely speaking, the Internet. The World Trade Organization (WTO) defines electronic commerce broadly as the production, advertising, sale, and distribution of products via telecommunications networks. It distinguishes three stages in the process of electronic commerce: searching, ordering and payment, and delivery, involving three types of commercial activity:

- The sale of products that may be advertised, ordered, and paid for electronically but which are ultimately delivered physically.
- The sale of products that are advertised, ordered, paid for, and delivered electronically.
- The provision of the infrastructure that makes the first or second type of transaction possible, particularly basic and enhanced telecommunications services.

E-commerce may also be simply defined as the production, distribution, marketing, sale or delivery of goods and services by electronic means. In its everyday application, e-commerce goes beyond the sale of products on the Internet. A wide range of services are now being directly supplied by companies to one another across the globe via the Internet. The financial services industry is the most obvious example but the business of online sales itself requires a range of

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3 ITU, 1999. ISPs are companies that provide access to the Internet.

4 The World Wide Web (Web) was developed at the European Particle Physics Lab as a means of sharing information among physicists working in a dispersed international environment. The physicists developed a standard for representing data online called hypertext markup language or HTML. Through HTML you simply attach a tag to a word or phrase causing it to become a link to another page. This link can be to a document on the same computer or on one across the world. (With the addition of video and graphics a new term "hypermedia" has emerged to reflect the fact that a link can be a photograph, video clip, sound or compound document that links you in turn to another such document). The Web provides users around the world with the ability to create their own multimedia information—seamlessly incorporating text, pictures, audio, and even video into customized electronic Web "pages"? that can be accessed and downloaded to personal computers by millions of other people. Scientists, educators, artists, corporations, governments, and ordinary citizens are using this unparalleled capability in ways that stimulate socio-economic development and individual empowerment.

5 Note that in the first month of operation in July 1995, *Amazon.com* sold to customers in 45 countries. In 2000, they sell in more than 150 countries.

6 *The Economist* reported that in 1995 consumers spent US $1.6 trillion with credit and debit cards. (“A Punch-Up in Plastic,” *The Economist,* 8 June 1996, 77).

services to support it such as Web site hosting, authentication services, database design and management, among others. More recently, online auctions and virtual markets have emerged and they have revolutionized how large corporations procure materials and supplies.

The paper focuses on electronic commerce and the opportunities and challenges it creates for the CARICOM region. Section I presents an overview of e-commerce and explores the relevance of this medium for the Caribbean. Section II examines e-commerce in the context of CARICOM countries and national policy initiatives in this area. Section III discusses the pre-requisites for successful e-commerce and assesses the factors affecting it in the Region. Section IV examines trade policy and negotiation issues relating to e-commerce in the multilateral and hemispheric contexts; and Section V provides recommendations for a CARICOM position.

SECTION I GLOBAL DEVELOPMENTS IN E-COMMERCE

I.1 Overview of Electronic Commerce

Electronic commerce has great potential benefits to CARICOM companies[7] because to a large extent it:

?? allows access to a mass market without the traditional high overhead costs
?? reduces physical barriers between customer and supplier ("death of distance");
?? overcomes distribution difficulties in North America and Europe caused by large scale requirements for all suppliers into mainstream supermarket chains, and retail outlets, etc.
?? greatly reduces the time involved and the cost of doing business globally;
?? provides opportunities for outsourcing arrangements with US and other firms in areas such as EDP, programming, data processing, among others;
?? reduces the administrative cost of doing business.[8]

At the global level, e-commerce is leading to profound changes in the way business is conducted. Networking and decentralized corporate processes have changed relationships between the producers and users of goods and services and promoted the rapid integration of markets. New phenomena such as online business-to-business exchanges and virtual trading networks are rapidly transforming traditional business practices by connecting critical business systems directly to key constituents like customers, employees, suppliers and distributors via the Internet.[9]

For businesses, online commerce is appealing because of its efficiency. Once a company's Web site is built, it can take orders round-the-clock, countless customer-service queries can be filled, product catalogs can be updated constantly, and information on market behavior can be easily accessed and updated regularly.

E-Commerce Business Models

Innovations in computing technology, especially software development, are working in tandem with the rapid changes in telecommunications technology. They both have impacted on the organization of business and are driving e-commerce. Accordingly, the operating systems of personal computers and similar devices are being designed to work seamlessly with the Internet. For individual users, the marriage of personal computing and the Internet provides the ability not only to create and manipulate electronic information, but also to access and disseminate it on a global scale. The Internet effectively opens up and extends the PC into the outside world, making all the knowledge and information stored in thousands of interconnected computers available to users whenever they want it. And for organizational users in the public and private sectors, the Internet is increasingly important for the management of operations and the delivery of goods and services.

Cyber traders or businesses without a significant physical presence which operate almost exclusively on the Internet have been over-hyped in the popular media and perhaps the attention paid to them surpassed their economic significance. The more sober attitude towards dot coms this year is an indication of a more realistic approach to Internet or e-commerce business models.

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7 See "The Original 20 Reasons to Put Your Business on the WWW" at www.net101.com/reasons2.htm.

8 It is now evident that the Web will lower the cost of doing business, although not necessarily prices. This is certainly true for some sectors such as banking in which an online customer is roughly a third cheaper than an ATM transaction and quite cheaper than service provided by a teller.

9 A well-known example is the online market for automotive parts set up in 1999 by General Motors, Ford and Daimler Chrysler; another is the online purchasing alliance involving IBM, Ariba (a business-to-business commerce platform) and software developer i2 Technologies Inc.

There are numerous classification schemes for business models on the Web.[10] And although it now seems unclear that the Internet medium would lead to incredible profits and fundamentally alter the business landscape,[11] it is clear that the "clicks-and-mortar" approach in which a company integrates its Website with existing order fulfilment, logistics and marketing, is here to stay. Nevertheless it is important to examine some of the different approaches to online commerce and we will do so below.

What Kind of Commerce is Taking Place Online?

The financial services industry has long been a user of data networks (electronic data interchange, EDI) with intranets and extranets ensuring electronic communications among banks and dealers. The advent of e-commerce has spurred consumers and firms to use online banking and trading of financial securities.[12] The most exciting retail products for consumers are those that for the first time ever, can be delivered electronically such as music, books, films, computer software, designs and patterns, financial services, among others. Ernst and Young and Forrester Research report that the most common products and services purchased on the Internet in North America in terms of value, are as follows: computers and software; books; CDs, music; travel; consumer electronics; magazines; hotel accommodation; air travel; videos; clothing; and event tickets. Also many people (individuals not companies) purchase a variety of things at online auctions such as *eBay*. In the next few years, the biggest gains in e-commerce are expected to be in the following sectors: computer hardware and software; advertising and marketing; media; publishing and information services; travel and tourism; finance; banking; insurance; brokerage and Internet services; and entertainment (music, videos). It is useful to distinguish between three significant types of e-commerce: business-to-business (B2B); business-to-consumer (B2C) and business-to-government (B2G). However, there are also categories such as government-to consumer (G2C) or e-government; government-to-government (G2G); and consumer-to-consumer (C2C) which are also evolving.

Business-to-Business (B2B) E-Commerce

The Internet and the Web have led to the re-creation of business models, the creation of radically new business models, and the creation of vertically integrated markets based on the availability of information flows. The Internet is changing every aspect of our lives, but no area is undergoing as rapid and significant a change as the way businesses operate. As companies incorporate Internet technology into their core business processes, they start to achieve real business value through faster transactions and lower costs per transaction, better decision-making as a result of more timely and accurate information, and increased profits. Today, large and small companies are using the Internet to communicate with their partners, to manage inventory, to connect with their back-end data-systems, and to transact commerce. This is what is referred to as "e-business"—where the strength and reliability of information technology meet the Internet. IBM defines e-business as "the transformation of key business processes through the use of Internet technologies."

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[10] See Paul Bambury, "A Taxonomy of Internet Commerce," for a succinct overview of different business models on the Internet. (www.firstmonday.dk/issues/issue3_10/bambury/index.html). See also Kaplan and Sawhney (1999). (http://gsbwww.uchicago.edu/fac/steven.kaplan/research/taxonomy.pdf).

[11] It appears that a lot of companies that started on the Internet are now opening bricks and mortar stores. See "Dot-Coms: What Have We Learned?" *Fortune*, Vol. 142, No. 10, October 2000.

[12] For instance, the Internet has transformed E* Trade, the world's second biggest online share dealer from a US$30 million private business in 1996 to a US$ 5 billion public business in 2000. *Financial Post*, August 9, 2000, C10.

The potential of e-commerce technologies to transform business practices is evident in the new market places that are developing online. These intermediaries have emerged rapidly in almost all industries, providing new places for buyers and sellers to meet, allowing a variety of pricing systems to flourish, changing the roles of traditional intermediaries, enabling complex transactions. Most of all, by making vast amounts of information available at relatively very low cost, they shift the balance of power among market players. The expanded reach of each of these online market spaces allows buyers to solicit bids from a broader range of suppliers, and in turn, allows suppliers to develop relationships with additional buyers.

B2B e-commerce consists largely of inter-company and intra-industry sales and procurement of goods and services on the Internet which is fast replacing private networks. Much of the B2B e-commerce nowadays are offshoots from EDI and privately run networks of a decade ago. On a more global basis, B2B e-commerce is evolving into large virtual marketplaces in which trading for a range of goods specific to an industry takes place. A growing share of business-to-business commerce is expected to move to the Internet in the next few years.

A major trend in B2B e-commerce is the emergence of electronic hubs or Internet-based intermediaries that focus on specific industry verticals or specific business processes, host electronic marketplaces, and use various market generating mechanisms to broker transactions among businesses. They create value by aggregating buyers and sellers and reducing transaction costs.[13] Purchases made by businesses can be classified as (i) manufacturing inputs; and (ii) operating inputs. The former consist of raw materials and components that are used in the manufactured product or process and they tend to be vertical in nature since the finished product that they go into tend to be industry-specific. So, they are usually sourced from specific suppliers and distributors, often requiring specialized logistics. Operating inputs are indirect materials and services that are not used in the final product but are used for maintenance, repair and general operations (MRO). These would be office supplies, capital equipment, travel-related services, etc., and tend to be horizontal in nature. They can also be handled and shipped by third party agents like courier companies.

Business also purchase through systematic sourcing or spot sourcing. The first involves negotiated contracts with qualified suppliers over the long term and depend on relationships with suppliers. The second, involves on-the-spot purchases (commodity-type products like oil, steel, power) from anonymous suppliers. It is transaction-specific and seldom involves ongoing relationships between purchasers and sellers. Electronic hubs can be categorized as four types: MRO hubs; yield managers; exchanges; and catalogue hubs. [14]

MRO hubs (Ariba, Commerce One, Bizbuyer.com) operate by improving the efficiency in procurement for a diverse set of industries by removing the existing middlemen from the distribution chain. This is easy to do because operating inputs are similar to a great extent across a wide range of industries.[15] ***Yield managers*** shield buyers and sellers from fluctuations in operations and are important in conditions of high price and demand volatility or very high fixed costs. Exchanges operate by maintaining relationships with buyers and sellers and the buyers and sellers seldom have direct relationships. ***Exchanges*** play the spot market and smooth out the peaks and slumps in demand and supply and hence deliver better prices to their clients. Finally, ***catalogue hubs*** put industry-specific catalogues online and aggregate the market by creating a

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[13] Well known electronic hubs include companies like Ariba, CommerceOne, Internet Capital Group, among others.

[14] See Kaplan and Sawhney (1999) for a detailed treatment of this subject.

[15] Note that Open Buying on the Internet (OBI) has emerged as an e-commerce technical standard intended for high volume, low dollar transactions, such as for MRO materials. It specifies a standard set of roles to which OBI-compliant vendors and purchasers must conform.

large network of supplier catalogues within the vertical group. They are common in the chemical and plastics industries (PlasticsNet.com, Chemdex).

The phenomenon described above is the evolution of Online Procurement Groups (OPGs). Just as big box stores revolutionized retailing (Walmart, Priceline, etc.), the recent explosion of virtual markets and online procurement groups (OPGs) is transforming the way firms do business with each other. OPGs typically involve the formation of a new entity, auction site or market to facilitate electronic purchasing on behalf of a group of participants in an industry. In recent months OPGs have emerged in the metals and mining, automotive, oil and gas, aircraft manufacturing, tyre, power generation, and paper and forest products industries.[16] The aim of an OPG is to reduce costs in the procurement of inputs for a group of industry participants. Through this mechanism, both suppliers and purchasers may have greater market information.

Consider for instance, the case of the textile and clothing industry. A group of Hong Kong's largest textile and apparel manufacturers are working together to create an e-commerce marketplace for the global clothing industry. It is estimated that the marketplace will be worth about $550 billion, and should be operational by the end of September 2000. TexWatch Inc., a textile and apparel industry portal (formed in September 1999) and host of the world's largest textile and apparel information gateway, Hoover Online.com and Cable & Wireless HKT will collaborate in this venture.[17] It is predicted that such initiatives will increase as firms try to reduce cost by eliminating the layers of intermediaries in the traditional distribution chain.[18]

An interesting initiative for developing countries is the Commonwealth Business Network (Combinet) that seeks to match up buyers and sellers across the 54 countries in the Commonwealth. Hopefully, it is acting as a useful e-commerce site for South-South trade in which businesses can get access to other firms that might buy their products and services.

It is not clear how the new large online marketplaces impact on their supply communities but some research seems to indicate that suppliers may be moving in the same direction towards aggregation. However, it appears that traditional intermediaries are not disappearing but re-inventing themselves and providing logistical, financial and information services. As buyers and sellers negotiate purchases, intermediaries provide estimates of shipping costs, and information on carriers, insurance, customs clearance, etc., and warehousing. An example from the chemical industry in the US is ChemConnect. [19]

Another trend in B2B purchasing has resulted in another mechanism—**online auctions**. Businesses are using auctions to sell off surplus goods, get rid of old equipment and advertise requests for purchases. Some are also using auction sites to request bids and this is all done in real time. This mechanism allows sellers to get the best possible market price for their equipment or products and services at low transaction cost.

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16 See Reuters, March 23, March 28, April, 11, April 13, 2000; *Financial Post*, April 28, 2000. For the Caribbean, the most significant may be the establishment by BP Amoco Plc, Royal Dutch/Shell Oil Group, Conoco, Dow Chemical and 10 other major energy companies of an oil and gas drilling, refining and petrochemicals OPG.

17 See www.hoovers.com/company and *Fritz Trade News*, July 20, 2000. Hoover's Online is also available through several Internet services, including America Online, Dow Jones, Microsoft, Reuters and Yahoo. Hoover's investors include Time Warner, Media General, NBC -- a unit of General Electric, and Knowledge Universe, through its Knowledge Net Holdings and Nextera Enterprises units.

18 This conglomeration is raising concern about the potential for anti-competitive behaviour but it is too early to make any judgement on that.

19 See US Department of Commerce, *Digital Economy 2000*, June 2000, p. 18.

Application Service Providers
In the online world a new type of entity (application service providers - ASPs) has emerged to facilitate e-commerce for mainly small and medium companies. Their role and raison d'etre is described in the box below. They may operate in both B2B and B2C transactions.

Application Service Providers (ASPs)

The term Application Service Provider (ASP) refers specifically to companies that provide services via the Internet to help firms conduct business online. ASPs are companies that supply software applications and/or software-related services for business transactions over the Internet. An ASP usually:

?? owns and operates a software application.
?? owns, operates and maintains the servers that run the application. The ASP also employs the people needed to maintain the application.
?? makes the application available to customers everywhere via the Internet, either in a browser or through some sort of network PC or thin client.
?? charges for the application either on a per-use basis or on a monthly/annual fee basis. In many cases, however, the ASP can provide the service for free or can even pay the customer.

Advantages of ASPs

The ASP model has evolved because it offers some significant advantages over traditional approaches. One thing that led to the growth of ASPs is the high cost of specialized software for e-commerce transactions such as authentication of credit cards. For small businesses and startups, the biggest advantage of using and ASP, is low cost of entry and, in most cases, an extremely short setup time. The pay-as-you-go model is often significantly less expensive for all but the most frequent users of the service. ASPs also reduce the need for very expensive and specialized IT infrastructure and staff and within small companies. For example, if the application a company wants to use for its online business requires an ORACLE or MS-SQL database, the company would have to support both the application and the database. Finally, the ASP model can also shift Internet bandwidth to the ASP, who can often provide it at lower cost than if the business were to purchase leased lines for instance.

Adapted from Marshall Brain, *How ASPs Work.* (www.howstuffworks.com/asp2.htm)

Business-to-Consumer (B2C) E-Commerce

This is the more popular type of activity that has resulted from the promotion in the "dot com" world of online retail giants. It consists of on-line retailing through such famous companies like *Amazon.com, CDWarehouse.com, Yahoo.com* and a multitude of small firms and individuals that sell almost anything via the Internet. B2C e-commerce is often reported in the media and it is rapidly increasing in scope although it comprises only a tiny percentage of total global e-commerce. An Ernst and Young survey of online retailing in six countries in October 1999 revealed that shoppers worldwide are increasing their spending in every country surveyed. In the US alone, 39 million people shopped online in 1999, compared to 17 million in 1998; in Europe, the number increased from 5.2 million in 1998 to 8.3 million in 1999. American consumers spent an average of $1,200 per year in e-commerce transactions.[20]

[20] *Global Online Retailing: An Ernst and Young Special Report,*January 2000.

The most common new products being sold on the Internet are items that can be digitized and delivered electronically such as music, books and videos. A lot of B2C e-commerce today has replaced mail order catalogue sales. The typical model is a company Web site with a range of products on display and a facility for online purchase. Consumers enter their order in a database and pay electronically and this information is transmitted via the Internet to an automated sales and order processing department that sends instructions to a warehouse from which the goods are shipped directly to the consumer by courier or regular post. B2C e-commerce is highly dependent on credit cards and is seriously constrained in jurisdictions in which credit card facilities are not available.

Business models are perhaps the most discussed and least understood aspect of the Internet world. There is much talk about how the Web changes traditional business models. But as we see below in the B2C category e-commerce is also likely to reinvent tried-and-true models. There are also variations and combinations of models or approaches. However, there is no fixed terminology for referring to online business strategies and the models may straddle several types of e-commerce (B2B, B2C, etc.).[21]

The mail-order retail model is typical of companies such as Amazon.com where a Web site shop front is employed to sell physical goods which are then posted or delivered. While goods are advertised and payment is made via the Internet these enterprises are very much based in the real-world and are really traditional retail operations with a Web-based shop front. This is probably the most common Internet business model and is best understood by most people.

The auction model. This is one of the oldest business models which has migrated to the Web. Auctions have been widely used throughout the world to set prices for products as diverse as agricultural commodities, financial instruments, and unique items like fine art and antiquities. Companies like eBay have popularized the auction model and broadened its application on the web to a wide array of goods and services. There are even a couple online auction sites in the Caribbean such as Go Bajan.

The ***electronic publisher*** model is typical of sites that sell books or music or other products that can be delivered electronically to the consumer. It is usually most effective in cases in which delivery time is critical or the consumer wants the product or service immediately. Some publishers now use this method to sell their products online and may or may not also sell the publication in hard copy. To some extent, this is still a specialized system but as digital delivery increases in popularity it is expected that this model will proliferate.

The advertising based model is epitomized by the success of many search engine companies such as Yahoo and also supports many other free Web sites. This model is similar to that used by commercial television and free print publications, where advertising revenues support the operation of a free service. There are numerous variations on this model but many involve the use of banner hyperlinked ads. Clicking on an ad banner takes you to a product home site and also records a click on the original site. There is usually some relationship between ad banner hits and fees paid to the site owners hosting the ad banner by the advertiser. Cookies or other means may be employed to count clicks.

The subscription model is typical of publishing and media companies and firms with products that have regular updates. It is well suited for combination with digital delivery. Typically a user will subscribe for access to a database of digital products for a specified period of time. Some

[21] Some analysts refer to the following categories for generic forms of business models instead: brokerage; advertising; infomediary; merchant; manufacturer; affiliate; community; subscription; utility. See Michael Rappa, "Business Models on the Web" (2000).

music sites and most adult sites operate in this way. Some systems operate on a fee basis (via credit card) for access to a larger number of other sites. However, very respectable and prestigious companies are now joining the ranks. It is significant that Encyclopaedia Britannica that was reluctant to abandon its worldwide chain of representatives now sells its information service online by annual subscription. However, consumers can also purchase the encyclopaedia on CD which is shipped to their homes or offices. Britannica was slow to realize the implications of the PC for its traditional bound product and lost out to more innovative but less prestigious encyclopaedia companies like Encarta and World Book that embraced the CD medium early. Britannica was eventually forced to change its whole business strategy.

The free trial model for software is similar to the "30 days free trial" retail model. Basically software is available for free download or distributed on CD-ROM but will only work for a limited period or will not be fully functional until a fee is paid and the software is registered. Registration is often mediated by an automated Internet session. Commercial software companies use this model as well as individuals and groups who are independent software developers. The software developed by these independents is often called shareware. The fee is generally small compared to mainstream commercial software.

The direct marketing model. The use of electronic mail direct marketing (known as spam) on the Internet has become so widespread and bothersome that it is almost universally abhorred. Spam is probably the most dramatic example of a real-world business model being crudely transplanted on to the Internet. The lack of real controls on the Internet has permitted the unrestrained proliferation of spam. However, it is interesting that the negative public relations created by the use of spam has not acted as a deterrent to the spammers.

The real estate model. Some companies apply this model by selling Web space, domain names and e-mail addresses. There are some Web-based enterprises that have secured ownership to domains which incorporate common names and words and they sell the right to use these on the Internet. There is obvious utility to having an address which is simple and memorable or which resembles a product name. Such names are necessarily scarce if not unique and therefore valuable.

A less well-known business model is ***Incentive schemes*** that are sometimes combined with advertising. Web-based market research companies use often this model in some form or the other. Examples include so-called "permission-marketing" and competitions. Opportunities to win prizes or to secure "free" or inexpensive goods or services are used to entice people to accept advertising or to provide personal information.

Business to Government (B2G) E-commerce

In most economies the government is the largest purchaser of the widest array of goods and services. In the past, bid procedures for government contracts were tedious and complicated and the turnaround time from advertisement to delivery and payment was very long. There are tremendous opportunities for B2G e-commerce in government procurement at all levels. This has potential for the widest range of goods and services from office supplies and equipment to military purchases. Furthermore, through networking technologies it can lead to significant savings for governments depending on how the business is transacted.

In addition, some e-businesses supply services to help government conduct its business online. As one commentator pointed out, some B2G transactions seem quite similar to the services of ASPs in the non-government context:

> National Information Consortium (EGOV) sets up "free" Internet-based portals for local and state governments, enabling the respective government agencies to do business online with its citizens and corporate customers. NIC then takes a piece of the transaction and processing of information fees taking place at the portals. Transaction fees amounting to NIC revenue could result from consumer/business applications for permits, a renewal request for a license or a filing of a report. NIC is at the forefront of the B2G procurement/infomediary opportunity.[22]

E-commerce is being used in B2G transactions for the same reason that it is employed in other forms of online transactions—ease of transactions and reduced time and transaction and administrative costs.

E-Government

A rapidly evolving aspect of the Web is e-government. [23] In a similar manner that the Internet made companies more efficient and able to respond to consumer needs, the Web is leading to a rethinking of how governments deliver services. Indeed, electronic processing of customs documentation would significantly reduce cost and speed up the business of traditional international trade. And simply posting information on a Web site regarding the steps required for many government services would certainly be convenient to the public.

E-government is still very much an evolving phenomenon but there are some trends. Already, many governments in developed and in some developing countries maintain Web sites in which they post information about themselves and their services for the benefit of their citizens. These are passive sites. A second level of service involves government Web sites that allow two-way communication in which citizens transmit information about themselves to update personal information such as addresses, etc., by email. A third, more sophisticated version of e-government consists of a means through which the public can use Web sites to pay bills (such as parking tickets, property tax, etc.), apply for licences and permits, and perform a wide range of transactions involving the public service, online. This currently occurs in several OECD countries. More recently, electronic filing of income tax returns is becoming a popular practice in some countries. These sites combine online self-service with functions performed by civil servants and must be coordinated offline. Finally, the most advanced form of government service on the Web involves a portal that combines the entire range of government services and allows online access to them based on need and function. It is not specific to department or agency. In such portals citizens can log on with a single password to contact any part of government. Two examples of this are Singapore's "eCitizen Centre," and MAXI that was set up by the state government of Victoria in Australia.[24] Similar initiatives are underway in other countries (UK Online).

One of the major causes of bureaucratic inefficiency is the fact that while government departments are vertically organised, many of the services that they have to deliver require complex collaboration between employees across departments. So it takes a long time for a file to weave its way through all the necessary channels. As governments discover the utility of the Internet, they are realizing that they will need to construct Internet portals, similar to consumer portals such as Yahoo that can provide a one-stop shop for all of a citizen's needs.

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22 Luke Fronefield, "Business-to-Government: The Next Frontier for Eyeballs and Transactions," in *The Internet Stock Report*, February 22, 2000.

23 *The Economist*, "A Survey of Government and the Internet," June 14, 2000, p. 4.

24 See *The Economist*, Op. cit, for an overview of the government portal system in Singapore.

In a somewhat related example, in Barbados, a pilot project to network the primary agencies involved in the approval process for any investment in the country should come on stream within a few months. The intention is to allow 15 departments (finance, industry and commerce, planning, customs, the Registrar, etc.) to interact and share information in a common database so that all sectors in government have immediate access to an investor's application and can comment on it. At the same time, it will allow any potential investors to have immediate access to information on the status of their applications. This system should significantly reduce the time it takes for approval of an investment and increase the transparency and efficiency of the whole investment process. It is aptly termed the "the Enabling Environment for Private Sector Investment" (EEPSI).[25] Another example is a new initiative consisting of an Internet-based Electronic Authorization of Exports Service (EAES) in Guatemala that will make it possible for Guatemalan businesses to acquire export licences online and significantly reduce the frustration of the past over long delays in approval.

The Internet will also allow governments to significantly reduce the cost of their operations, even in the most basic tasks such as providing information to citizens. In the case of the Caribbean, e-government should be considered for its effect in promoting e-business. It is instructive that foreign governments are rapidly becoming aware that their own e-government strategies can have a tremendous catalytic effect on business in general. As *The Economist* notes:

> Just as Ford and General Motors can push their suppliers into doing business with them through online exchanges, so can governments, thus galvanising thousands of small firms in becoming e-businesses. By harnessing the efficiency, transparency and accountability that is inherent in the Web to improve all aspects of government-to-business and business-to-government transactions, they can deliver an economic boost.[26]

Although e-commerce discussions have not generally included government in the equation, (except in terms of regulation), there is a range of commercial activities that government engage in that lend themselves very well to e-commerce. In most economies, government is the largest purchaser and this is quite true for the Caribbean. We shall deal with this in greater detail below.

As more governments go online and conduct their business and facilitate access to their services by citizens there are tremendous dividends in terms of transparency and accountability. This should strengthen and improve governance and lead to more informed and better-managed societies. However, the first pre-condition for e-government is universal access to the Internet and this is an area in which all governments and Caribbean governments in particular, have significant work to do. Although e-government will pay significant tangible and intangible dividends, it requires bold and forward-looking thinking by governments since it will shift a lot of the power that civil servants currently wield (as a result of their control over information), to ordinary citizens. Furthermore, investment in the infrastructure for e-government will require significant resources and major internal negotiations over who will be responsible for it.

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[25] There were significant delays in EEPSI's development because of the multi-stakeholder approach and the need for new thinking by departments that previously jealously guarded their "turf". The network is now awaiting a frame relay to be installed by Bartel, the national telephone company. (Brenda Pope of KPMG in Barbados is coordinating this project).

[26] *The Economist*, Op cit., p. 9.

How Important is E-Commerce?

To illustrate the importance of the Internet and e-commerce we note the following statistics. Over 200 countries are now connected to the Internet, compared with only 20 a decade ago. In 1981, there were only 213 Internet hosts or servers. There are now some 43 million main servers[27] - an exponential rate of growth which could provide a wealth of opportunity for many countries. Canada's Task Force on Electronic Commerce reported that in 1999, global e-commerce was estimated at US$111 billion and Canada accounted for about US$8 billion of that total. Business-to-business (B2B) e-commerce comprised 87% of this amount. Although business to consumer e-commerce is very small at this point, it is increasing rapidly. For instance, the percentage of Canadian Internet users that have made a purchase via the Internet increased from 11% in 1996 to 25% in 1999. American consumers made an average of 13 online purchases per year in 1999, compared to only 4 in 1997.[28] While e-commerce remains very tiny compared to traditional merchandise trade, it's economic benefits are changing the way companies operate and in the long run can become a significant part of overall global trade.[29]

The profile of countries that benefit most from e-commerce at the moment are industrialized economies in North America, Europe and Asia with sophisticated telecommunications networks and wealthy, informed, computer-literate consumers. However, although a few years ago it was mainly large companies that were taking advantage of e-business, that is no longer the case. Thousands of small firms in various economic sectors are now rapidly going online as they see the market opportunities presented by the Internet.[30] These range from small "bed and breakfast" establishments in the tourism sector to software development firms and advertising agencies. The possibilities appear limitless. The biggest impact in the retail sector has been in the distribution of consumer electronics, books and music. In B2B e-commerce there is a very diverse profile of the economic sectors that are actively engaged in e-business.

The Center for Research in Electronic Commerce at the University of Texas points out that in just five years since the introduction of the World Wide Web, the Internet economy[31] already surpasses centuries-old sectors like energy ($223 billion), automobiles ($350 billion), and telecommunications ($270 billion) in size.[32] (See Annex I). They estimated that the Internet economy was valued at $523.9 billion in 1999, of which e-commerce comprised $171 billion. From 1998-99 Internet-related revenue growth was 15 times the growth rate for the US economy. Furthermore, the growth of jobs in the Internet economy is phenomenal. The total number of Internet/IP based jobs in June 2000 was estimated at 2.476 million, and many of these (Web design and development, Internet consulting) did not exist before 1994/95.

A troubling fact of this new digital world is that much of the new technologies and systems are being developed and utilized in the industrial countries, particularly OECD economies, and developing countries (LDCs) are rapidly being left behind. This is what is popularly referred to

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27 As reported by Jose Pileggi, chairman of the Inter-American Telecommunication Commission (CITEL) at the WTO Seminar on Electronic Commerce, Geneva, Switzerland, August 18, 2000.

28 Ernst and Young, 2000.

29 The WTO reported that global merchandise exports amounted to US$ 5,460 billion in 1999; in NAFTA alone, it totaled $1,226 billion.

30 One example is the Asian Sources Media Group (ASM), a publishing company in Hong Kong whose Web site serves as a shop front for more than 7,000 Asian suppliers (mostly small-to-medium-sized factories) in Hong Kong, China, Taiwan and Korea whose products range from cheap plastic toys to multimedia electronics. Before they joined the ASM network, many factories did not even have a personal computer. The site now generates 50,000 inquiries per quarter. "Asian Electronic Commerce," *The Economist*, July 1997.

31 This includes economic activity relating to infrastructure, applications, intermediaries and e-commerce activities.

32 See www.InternetIndicators.com or http://crec.bus.utexas.edu/works/articles/internet_economy.pdf.

as the "digital divide." The ITU reported that of all the Web sites in the world, Canada and the US accounted for 64.1 %, Europe 24.3%, Australia, Japan and New Zealand had 7%, the rest of Asia-Pacific 2.9%, Latin and Central America 1.2% and Africa 0.5%. While the English Caribbean is fairly advanced compared to other LDCs, there is still much room for improvement and policy initiatives are needed to reduce the digital gap with North America.[33] Although it is primarily in North America that e-commerce is most dynamic, the European Union and Japan are rapidly advancing in this area as well. Firms all over the world are moving quickly to take advantage of the Internet medium for attracting and conducting business on a global basis. It is noteworthy that e-commerce has made location almost irrelevant. In fact, it is often a futile task to try to find out in which country any particular online firm or Web site is located.

Why is the digital economy and electronic commerce of relevance to Caribbean policymakers and business? It is important because it exists and it is establishing new ways of doing business and a new economic paradigm that bring new opportunities and challenges. Caribbean economies must ensure that they participate in this new economy and the revolutionary changes that it is initiating or face the prospect of becoming redundant. Although e-commerce in the Region is very miniscule, it is important to note that Dell sells computers in the Caribbean without having any local office and Amazon.com also sells books and other products from the US. It is not far-fetched to assume that if Caribbean businesses do not react quickly, calypso and reggae music might be sold to Caribbean consumers from the US, rather than local music stores. Getting online is important to Caribbean firms for the same reason foreign companies are rapidly shifting to the Internet? to avoid losing out to competitors that are more accessible. From a national perspective, Caribbean governments must also try to ensure that e-commerce develops as a new medium for increasing trade and economic opportunity for the Region, rather than simply another means of increasing consumption of foreign goods and services, albeit delivered electronically. This means that mechanisms must be put in place to facilitate the rapid development of Caribbean e-businesses in order for them to stake their claim in the Internet marketplace.

I.2 The Impact of Technology

Trends in Computing Technology that Impact on E-business

The remarkable increases in computing power resulting from the microprocessor is further enabling the widespread diffusion of new electronic devices in helper technologies and personal digital assistants (PDAs). Miniaturization of computing devices is also opening up new applications and possibilities for e-commerce. Most of the personal hand-held devices will eventually be totally Web interactive. This has positive implications for e-commerce.

Digitization and audio compression

Perhaps the single most important change in technology that led to widespread applications for the Internet was digitisation of the media and networks. Digitization made it possible for all information—data, text, audio and video content to be used in any order and rearranged at will. Furthermore, digital content can be transformed for use in another medium? from text to voice or vice versa. Digitization not only improves sound quality (CDs compared to tapes) but also

[33] At their Summit in July 2000, G-8 leaders expressed concern about the increasing digital divide between the rich and poor countries. They committed to pursue the aims and ambitions set out in the Okinawa Charter on the Global Information Society. They also agreed to set up a Digital Opportunities Task Force (dot force), to recommend global action to bridge the international information and knowledge divide and pledged funds to address the imbalance.

enables interactivity. This provides the foundation for a whole new generation of computer- and network-based applications. It also allows radically new approaches to finding and managing information. Now compression of audio signals with MP3 technology makes it possible to put voice applications in almost limitless places and it has made e-commerce mobile.MP3 reduces the original sound data from a CD by a factor of 12 without affecting sound quality. Because MP3 files are small they can easily be transmitted across the Internet. There are now hand held devices that can play MP3 music, send and receive phone calls. As PC Magazine pointed out:

> Already through wireless applications mobile workers can access corporate email and calendaring functions, perform order entry and order tracking, review sales forecasts and inventory status, gather customer transactions and interaction histories, book travel reservations, get directions and obtain information such as customized news and financial reports.[34]

***Extensible Markup Language (XML*)**
On another note, the evolution that started with email, progressed into HTML, and is now pushing toward XML, a new information sharing standard that is rapidly being incorporated into what is termed as " knowledge publishing." Extensible Markup Language (XML) is the universal format for structured documents and data on the Web. Today's e-commerce Web sites depend on dynamic, real time data. For example, if you want to choose the colour and design of a pair of pants on the Web or reconfigure a particular standard pair to your preference, you will need real time interaction on the vendor's site. This activity involves two steps – collecting information and disseminating it. XML makes that possible. For some time now, researchers have identified a major problem faced by Web users as getting to the right information and doing something useful with it once found. XML enables precisely targeted content? the delivery mechanism can know who you are, and what you want to know. This is leading to personalization in publishing using XML on the Web. Personalization not only includes bringing you content that is tailored to your needs/likes or that which has changed since the last time you accessed the information. It also specifically filters out that which you don't want to see, or perhaps that which you have already seen and acknowledged.

Software developed in Japan by Intacta can convert an audio clip into tiny patterns of dots (Intacta Code) that can then be printed in a newspaper or magazine. When this image is scanned into your computer Intacta's reader software (available for free on the Web) reconstitutes the pattern of dots into the original audio clip. This technology has tremendous possible applications in diverse media and in numerous fields and can further revolutionize the concept of multimedia.

In the final analysis, convergence of computing and telecommunications technologies is catapulting e-commerce to new levels.

Trends in Telecommunications Technology that Impact on E-business

Dialup Access
Although it is very difficult, some would say impossible, to anticipate and plan for the evolution of the Internet, it is critical to understand the importance of technology to the Internet, the Web and the whole digital economy. A typical dial-up connection to the Internet in most parts of the world is a telephone line. Telephone lines were designed for voice covering the frequency range of 0.3 – 3.5KHz. Using coding and modulation techniques, typical to a standard modem, it is possible to get these systems to run up to 33 kbs. The basic V34 modem in a personal computer is rated at 28.8 kbs, depending on the quality of the line and switching standard. At this speed it

[34] "Wireless E-Biz," *PC Magazine,* August 2000, p. 79.

takes one second to transmit one page of text. A single video image takes 120 seconds and to download one second of uncompressed video for subsequent replay requires 840 seconds (14 minutes). The new standard 56 kbs V90 modems make a small difference in terms of speed. However, with ISDN technology (Integrated Systems Digital Network), the bandwidth in a normal telephone line can be improved to some 64 kbs or 128 kbs but this only provides marginal improvements over the V34 modem. As more firms and consumers get Internet access and rapidly embrace the Web it has led to bottlenecks in the local access loop? the connection between the home/business and the ISP.

Modem or Line Speed	**Time to Download**			
Bits per second	1 MB	2MB	5MB	10MB
9600	17 min	34 min	1.4 hr	2.8 hr
14.4 k	12 min	24 min	1 hr	2 hr
28.8 k	5.5 min	11 min	28 min	1 hr
56 k	3 min	6 min	15 min	30 min
1.5 M (T1)	7 sec	14 sec	35 sec	1 min

Chart courtesy of Videonics, Inc., 1997. (www.clic.com.hk/clic/web-video-support-files/size-and-times.htm)

Now, high-speed access or "broadband" at transmission speeds of 960 kbs to 2 million bits per second (2 Mbs) is making rapid transmission of full colour and full motion video possible. And this is creating a wave of new applications for the Web and increasing the possibilities for e-commerce. As one executive of MCI, a pioneer of the Internet put it:

> Eight years ago we were transmitting at a speed of two pages per second. The new network transmits at the speed of 'two small public libraries per second.'"[35]

Furthermore, the Web, unlike television or radio is interactive and offers a two-way flow of information. It is important to consider the different technologies involved in broadband or bandwidth since they affect the types of uses of the Internet and the potential for e-commerce.

Broadband Internet Access

Broadband or high-speed Internet access is provided by a series of technologies that give users the ability to send and receive data at volumes and speeds far greater than current Internet access over traditional telephone lines. In addition to offering speed, broadband access provides a continuous "always on" connection (no need to dial-up) and a "two-way" capability? the ability to both receive (download) and transmit (upload) data at high speeds.

Broadband access, along with the content and services it might enable, has the potential to transform the Internet? both what it offers and how it is used. For example, a two-way high speed connection could be used for interactive applications such as online classrooms, showrooms, or tele-medicine in which teacher and student (or customer and salesperson, doctor and patient) can see and hear each other through their computers.[36] The high speed and high volume that broadband offers could also be used for bundled services, where for example, cable television, video on demand, voice, data, and other services are all offered over a single line. In fact, many of the applications that will best exploit the technological capabilities of broadband, and fascinate consumers and corporate executive, have yet to be developed.

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35 *The Digital Economy,* p. 102.

36 An "always on" connection could be used be used for various other applications such as monitoring home security, home automation, or even the delivery of patient health diagnosis remotely through the Internet.

Many offices and businesses in North America and Japan now have broadband Internet access. A major remaining challenge is providing broadband over "the last mile" to consumers in their homes. Currently, about 2.2 million homes in the United States (about 2% of all households) are wired for broadband access. However, the changeover to residential broadband has begun, as companies have started to offer different types of broadband service in selected locations. Throughout the telecommunications and information industry, companies have been investing, acquiring, and merging in order to position themselves for what is felt to be a coming explosion in broadband Internet use. No one knows exactly how many consumers will be willing to pay for broadband service but they seem very enthusiastic about it. Current costs to consumers range from about $40 and upward per month, plus up to several hundred dollars for installation and equipment.[37]

Broadband Technologies

Three kinds of transmission media are used in telecommunications and they have all been transformed by computerization. The first is traditional wireline transmission consisting of twisted pairs of copper wires as in telephone lines. Coaxial cables are also used in some networks and they have the capacity of 900 times copper wires. In the last fifteen years, fibre optic cable technology replaced both. It uses a laser or light source to convert digital electrical signals of either audio, video or data input into pulses of light that are then transmitted over the network and then reconverted into electrical signals at their destination. Fibre optic cables can handle transmission rates of thousands of millions of digital bits per second and this is what drives broadband networks. For instance, a single digitized voice requires a transmission rate of only 64,000 bits per second (64Kbs) but digital video requires at least 30 million bits per second.[38]

There are multiple transmission media or technologies that can be used to provide broadband access. These include cable modem technology, an enhanced telephone service called digital subscriber line (DSL), satellite technology, terrestrial wireless technologies, and others. Cable modems and DSL are generally acknowledged by many observers as the most promising technologies for providing broadband access, at least within the next couple of years. Both require the modification of an existing physical infrastructure that is already connected to the home (i.e. cable television and telephone lines). Each technology has its respective advantages and disadvantages, and will likely compete with each other based on performance, price, quality, geography, user friendliness, and other factors. [39]

Cable Modems

Cable modems are high speed modems supplied by cable television operators that allow users to access the Internet or other information services over cable television networks. These networks consist of broadband coaxial cables and are capable of much greater speed than conventional

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[37] According to research from Juniper Communications, broadband users in the US will reach about 5.5 million by the end of 2000, compared to 43.6 million dial-up users, and by 2002, broadband penetration will be 11.7 million users or 19% of online households. (www.junipercommunications.com/).

[38] For an interesting overview of new technologies see, Ken Jacobson, "Communications Technology in Transition." (www.usinfo.state.gov/products/pubs/telecomm/jacob.htm)

[39] According to Kinetic Strategies Inc., in May 2000, the total number of cable modem subscribers in the U.S. and Canada reached 2.7 million, an increase of 900,000 customers, or 33 percent, since the end of 1999. As a result, North American cable modem subscriber additions in the first four months of 2000 exceeded the total number of digital subscriber line (DSL) customers installed for service over the past four years. U.S. cable operators now serve 2 million broadband Internet customers and Canadian operators count 700,000. As a group, North American cable operators are now installing more than 7,000 new cable modem subscribers each day. Cable modem service is available to 48 million homes in the U.S. and in Canada, equal to 44 percent of all cable homes passed. (www.kineticstrategies.com)

twisted pair copper telephone lines. However, cable modem technology requires expensive investment by cable companies who have to install new network management tools, two-way amplification and sophisticated termination equipment to support it. Nevertheless, cable operators in the U.S. are rapidly investing to upgrade their systems.[40] There was also a series of high profile acquisitions and joint ventures in the US cable industry during 1999.[41] These examples indicate the trend towards massive growth in Internet access via cable modems as consumers and businesses make greater use of the Web for new applications and demand faster access for downloading full graphics and video programs.

Digital Subscriber Line (DSL)

DSL is a modem technology that converts existing copper telephone lines into two-way high speed data conduits. While there are a number of types of DSL technologies, the most used currently is ADSL, or Asymmetric Digital Subscriber Line ("asymmetric" because transmission speed is higher from the Internet to the home than from the home to the Internet). At present, ADSL is only available to homes within 18,000 feet (about three miles) of a central office facility. Applications such as streaming audio and video, dynamic content delivery, e-commerce, network-hosted applications, and other enhanced Internet services are driving demand for DSL. The phenomenal growth of this sector in the US is instructive.

According to TeleChoice Inc., 275,000 DSL lines were in service in the United States by the end of the third quarter of 1999. This increased by 75 percent by the end of 1999 and 9.5 million DSL customers are expected by the end of 2003. Smaller telecommunications companies, that currently provide DSL service to businesses, are also seeking access to the residential DSL market. Additionally, a number of ISPs have signed cooperative arrangements with DSL providers. It is expected that there will be similar growth in DSL services globally, as long as there are no market restrictions.[42]

As the supply of broadband spreads to consumers and businesses, the technology on the backbone of telecommunications carriers has also had to increase rapidly, at almost exponential speed. In the fibre optics industry the switch to multiplexing[43] technology greatly increased the capacity and speed of transmission on networks. This was replaced by "dense wave multiplexing" a few years ago; and now "ultra dense wave multiplexing" underscores the rapid evolution of technology and the increase in the speed of transmission of data and signals. In 1998, Ciena introduced its MultiWave 4000 system, a 40-channel system that is scalable to 96 channels and can deliver 100 Gigabits per second (Gbs) on a fibre optic cable.[44] The advent of high-speed access systems is the primary driver behind the desire by telecommunications carriers to continue developing large-capacity systems. Technologies such as digital subscriber line promise to deliver faster access speeds to both business and residential users. And when access speeds of one megabit and higher are widely available, the strain on the backbone to accommodate the traffic will be much greater than today, when most users access the Internet at a maximum rate of only 56.6 kbs. The capability of rapid download and upload of data from the

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40 Deregulation of the US telecommunications industry in 1996 allowed cable companies to sell telephone service and this stimulated a slew of high profile, multi-billion dollar cable and phone company mergers.

41 For example, AT&T's purchase of cable giant TeleCommunications Incorporated (TCI) for $55 billion, as well as its planned $58 billion acquisition of MediaOne Group (pending regulatory approval). Meanwhile, Microsoft is investing $5 billion in a deal with AT&T to ensure access to the 2.5 to 5 million cable set-top boxes that AT&T plans to deploy. (*ZDNET*, June 26, 1999).

42 www.telechoice.com/content/whitepapers/NewEdge_TP.pdf

43 Multiplexing mean combining several signals for transmission on some shared medium (e.g. a telephone wire). The signals are combined at the transmitter by a multiplexor (a "mux") and split up at the receiver by a demultiplexor.

44 Sprint was the first company to deploy this system. One gibabit is equivalent to one thousand megabits. See Wayne Carter, "Bandwidth for Tomorrow," in *Telephony*, May 11, 1998. (www.internettelephony.com).

Internet is a powerful incentive for new uses and applications and this will further stimulate e-commerce.

Wireless and Satellite Services

Another transmission method is terrestrial wireless systems in which microwave towers serve as substitutes for wires in certain parts of a telecommunications network. This depends on cost and topography. Messages can then go from a residence or business through wires in the local area to a microwave link and then back into wires, and so on. This is a rapid growth segment of the market for television and Internet access in North America and similar trends are emerging in other parts of the world. A third type of system is space-based wireless communications using high-orbiting satellites. Another type of satellite, the very small aperture terminal (VSAT) works in tandem with land-based wireless transmission stations and usually provides intra-firm communications. More recently, it has been introduced in the residential market and can prove to be a very cost-effective means of providing Internet access to consumers. Analysts also predict a rapid increase in low-earth orbit satellite (LEOs) that will support personal communications networks.[45] The appeal of wireless communication is that its base stations and network of orbiting satellites and central facility for switching and controlling calls can be installed in months, rather than years. It also allows countries with populations in remote areas access to other regions or the world, for a relatively small capital investment compared to traditional telcommunications networks.

Cellular Internet Access

Yet another type of wireless technology connects directly to the end user? cellular telephone systems. Recent improvements in cellular receivers and other hand held devices are opening up an entire new range of possibilities for products and services delivered via the Internet. Perhaps, the next major trend in Internet access is via cellular phones. Industry experts estimate that in 2000 nearly 100 million phones with Web access will be sold worldwide? about 12 times the number of hand-held computers. However, it is not realistic to expect that cellular phones will be used for anything more than simple online tasks as checking email, instant messaging, checking news headlines, weather news, stocks or bank accounts and for shopping. These services will have to be highly personalized because of the size limitations of a cellular phone. Nevertheless, technology companies are now experimenting with Internet services activated by voice commands sent over cellular phones.[46] This may lead to a new type of online entity or "voice portal."

Currently, the demand is for mobile banking or commerce. But wireless technology seems to be leading to a convergence of news, advertising, email and entertainment (games, music, video) in portable formats such as hand-held devices. It is expected that one might soon be able to check stocks, receive telephone and email messages and watch news on devices that are a cross between cellular phones and palmcorders. On the business side, teleconferencing on the move is also a clear prospect.[47] The market trend is driving a convergence between media and wireless companies. There is a rapid increase in mergers and acquisitions in North America and Europe that are marrying newspaper and TV content with Web portals and wireless networks.

Internet Protocol Telephony

Another technology that is rapidly gaining attention and use is Internet Protocol telephony (known as "voice-over-IP) or "VoIP"). It has particular relevance to all economies in which traditional telephone costs are high, as in the Caribbean. VoIP takes a voice call, splits it into

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[45] The leaders in the US include Motorola's Iridium, and Teledesic by Microsoft, among others.

[46] Tellme Networks, a startup company backed by AT&T already offers Web services sent over the phone. See "Future Calling for Net cellphones," in *Financial Post*, August 8, 2000.

[47] One of the companies leading the trend in mobile communications is Research in Motion. They supply mobile email, wireless handhelds and wireless modems.

packets, transmits the packets over an IP network, and then reassembles them at the final destination where they are converted back into voice signals. VoIP can provide features such as unified messaging that enables voice mail, email and faxes to be checked and sent through a Web browser. This has obvious cost implications for telephone calls since it can be significantly cheaper than public switched telephone networks (PTSN). One of the main reasons is that VoIP calls bypass the traditional global revenue-sharing arrangements and terminal rates issues among telephone companies. Since terminal rates are the main cause of high international telephone tariffs in the Caribbean, VoIP is an attractive alternative.

The technology is unrefined at this stage and IP networks cannot yet guarantee the consistent quality, security and calling features of traditional telephone networks. However, due to the potential demand for this technology, the problems will soon be addressed. The Internet is making telephone companies rethink their whole raison d'être. VoIP has tremendous potential for the Caribbean in the call centres industry and traditional telephone traffic. The major constraints are the lack of clarity regarding the jurisdiction of incumbent monopolies and whether VoIP is classed as a basic telephone service or value-added service under the General Agreement on Trade in Services (GATS) of the World Trade Organization. It was reported that Cable & Wireless has blocked Web sites in the Region that were offering call back services and in Guyana the local telephone company also tried to prevent the use of VoIP.[48] The status of VoIP needs to be clarified by all CARICOM governments. But for all intents and purposes, it should be classified as a value-added service and be opened to competition.[49]

The point in the preceding discussion for all governments, and particularly in the Caribbean, is that the best mechanism for dissemination of new technologies is the market. This is also critical to allow business and consumers access to networks. Any telecommunications regime that restricts competition will constrain technological upgrades. The rapid technological changes are leading to greater and greater use of the Internet and the Web for commercial and private purposes. This has implications for societies all over the world. The economies that do not keep close to the mainstream technology will be unable to take advantage of opportunities in the global digital economy.

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[48] In the case of the British Virgin Islands, in April 2000, the government decided to stand clear of the issue and indicated that it was a private matter between two companies.

[49] Caribbean governments should take note of the fact that Cable & Wireless PLC in the United Kingdom announced on October 3, 2000 plans to contract Nortel Networks to handle both domestic and international voice and data transmissions for C&W's business customers in Britain, Europe and North America. It is anticipated that by using VoIP technology C&W will be able to deliver voice transmissions at just 25 % the cost of conventional PTSN circuitry. John Partridge, "Nortel, U.K. giant make a bet on the Web," *Globe and Mail*, October 3, 2000, B1.

SECTION II RELEVANCE OF E-COMMERCE TO THE CARIBBEAN

II-1 Potential Benefits

Opportunities
While globalization led to footloose investment, Internet-based B2B e-commerce creates new market structures that allow business partners to switch allegiances at low cost. The Internet expands choices and options to suppliers and consumers on a phenomenal basis. It also enables buyers and sellers to exchange information, best practices and market feedback in real time. In other words, it has heightened competition and requires rapid responses to client needs by all economic actors. Firms and countries that are left out of the loop could end up in economic isolation.

The Canadian and United States governments, as well as other OECD governments, have recognized the great potential for growth and development through this digital medium as Internet users increase by the tens of thousands each month in developed countries. Governments, businesses, and consumers around the globe appear to be embracing one or more aspects of electronic commerce with an enthusiasm only occasionally afforded to a new technology. Users in developing countries, scrambling to catch up, are quickly learning the power of digital technology as a tool for accelerating economic growth and development. Although consumer purchases via the Internet have increased exponentially in the last two years, experts predict that the biggest electronic commerce market will continue to be business-to-business transactions rather than consumer trade.

Several Caribbean governments have expressed interest in bringing their economies into the digital age. However, it calls for rapid policy changes to provide the physical infrastructure and the regulatory environment for information technology and e-commerce to grow in the Region. Indeed, in most government offices, e-mail is only available to a select few and computers are still a scarce commodity in the public service.

II-2 Challenges

Disintermediation
One phenomenon that is often associated with e-commerce is the notion of "disintermediation." It is a term used to describe the "disintegration" or extinction of the middle men in the trading chain as we know it today—the distributors, wholesalers and retailers. In the world of e-commerce, many manufacturers and service suppliers will want to trade directly with the consumer, thus eliminating the costs added to a product by the intermediaries that handle goods in traditional business. The most obvious example of this is the airline industry in North America where online ticket purchases are making travel agents redundant to some extent. Already, airlines have reduced the commissions paid to travel agents and the industry has been informed that there will be no commissions in a few years. Although this is good for the consumer, it can lead to the loss of retail jobs and perhaps other jobs in the distribution chain. Another example is in the real estate industry where brokers are the true intermediaries who provide a service to buyers and sellers because of information asymmetries in the marketplace. As more and more information is available online, real estate agents seem threatened. However, it is far-fetched to assume that these types of services and jobs will be totally eliminated.

Disintermediation might be a good thing for many tourism operators in the Caribbean. In fact, most hotels can become e-businesses and avoid the cost of the revenues lost to intermediaries for booking their services. In the past, foreign travel agents and airlines charged premium rates for reservations. Some hotels indicated that they could lose up to 20 percent in this manner. An

efficient hotel industry portal as proposed by the Caribbean Tourism Organization would lead to significant cost savings to local hotels and ensure that they have a presence in the global marketplace. [50] But being on the Web is not enough, it is critical that Caribbean tourism operators appear on all search engines and this may require negotiation with individual companies. For instance, a search for a New York-Port of Spain flight on Expedia.com does not list BWIA as one of the possible airlines. Caribbean firms need to pay significant attention to marketing on the Internet as a critical part of their business strategy.

The challenge is for companies to find new ways of delivering value to customers. So, for instance, travel agencies specializing in business travel can become convention planners. At the personal level, many people will still not have the time to apply for a visa, find the most suitable hotel, or other services in foreign destinations so travel agencies are now providing such services for a fee. One innovative company in North Carolina (Summit Travel) developed a software package that helps travelers search the Internet for flights and make the transactions themselves. The software also routes the reservation through the company which receives a rebate of 5% of customers' fares.[51]

But disintermediation is impractical if it is implemented on a global scale. Situations will arise where a consumer will want his product the same or next day - something that is impossible to achieve if the manufacturer is on the other side of the world. So, in the real world of global trade, distributors will still be needed for "just in time" product distribution. Nevertheless, analysts suggest that fears about massive job losses as a result of disintermediation are perhaps exaggerated. They point out that although some parts of the distribution chain are being eliminated, there is also a process of "re-intermediation" in which new companies are formed to meet the needs of buyers and sellers on the Internet. This is the advent of "portals" such as Yahoo.com and online buying groups, and a range of other firms that supply services that are now critical to e-commerce. Furthermore, express delivery services are expanding rapidly and they in turn need a range of new services that are communications and software based that create new jobs.

Loss of Jobs?

A related concern is the impact of e-commerce on domestic employment, an issue that is particularly sensitive for developing countries such as CARICOM with young people comprising a large percentage of their population, and high unemployment rates. Employment in distribution activities is very high in countries in the Region and hence governments have traditionally not been enthusiastic about labour-saving technologies, particularly in the public services.

In certain market sectors, in all CARICOM countries, there could be some unemployment effects of increased electronic commerce if retail elements are gradually eliminated from the distribution link between the producer/supplier and the consumer.[52] But as is clearly evident from the US and Canadian economy, e-commerce leads to the creation of a multitude of new jobs, albeit requiring new skills. The challenge for Caribbean countries is not to waste effort on protecting current low level retail jobs but to train people to perform the new jobs that drive e-commerce such as Web

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50 Caribbean Tourism Organization, "Caribbean Global Gateways: Developing a Regional Internet Strategy for the Caribbean," February 2000.

51 *The Digital Economy,* p. 58.

52 The success of Dell in selling computers exclusively on-line and by mail order compared to the current woes of Compaq may be an obvious example. Compaq, the largest US manufacturer of personal computers, earned $16 million in profits on $5.7 billion in sales in the first quarter of 1998 while Dell's profits in the same period were $305 million on $3.9 billion in sales (Court, 1998).

site design and development, programming in Javascript, database design and management, online advertising and marketing, among others.

Consumers rather than sellers

In the case of the Caribbean economies, one clear threat from e-commerce is the risk that instead of selling more products to the world through the Internet, people will simply consume more products from North America. This can have damaging impacts on local substitutes as there is already a very consumer-oriented bias in most islands because of the small size of the economies. E-commerce can lead to the demise of small factories in the Region that produce consumer products if cheaper products are sold online from overseas locations. (Hence, from one perspective, the WTO moratorium on customs duties on imported products sold through e-commerce can be a problem in the Caribbean). The scale and purchasing power of giant online firms such as Yahoo and Amazon.com make then more efficient and competitive. This phenomenon is already quite evident in Canada in the book retail business in which Chapters Online is apparently driving small independent booksellers from the market.[53]

Inability of Caribbean Firms to Adjust

E-commerce intensifies competition among suppliers in each product market and may lead to intense price competition. The possibility exists that vulnerable traditional firms that cannot compete may be forced out of the local and foreign markets for some products by more efficient firms that aggressively pursue online business. If Caribbean firms do not adjust quickly to the digital medium for international trade they will not be able to enjoy the benefits that market integration and networking bring to foreign firms and they may actually become the victims of that phenomenon. In spite of all the billions of dollars of B2B e-commerce in North America and Europe, there is very little B2B e-commerce in the Caribbean. Businesses appear too small to see the need for networking and using the Internet in their purchasing, marketing and other operations. Furthermore the CARICOM market is too fragmented and business strategies are national, not global, except for a few firms. Other limiting factors are the traditional conservative attitude toward new technologies and lack of awareness of the need to become integrated into the digital economy. The onus is on Caribbean governments, industry groups and chambers of commerce to educate businesses in the Region of the possibilities and challenges created by e-commerce and the digital economy in general. Information on Caribbean-based multinational corporations is not available but it is likely that they are the biggest users of e-commerce in the Region.

Loss of Regulatory Control

For governments, perhaps the biggest threat from e-commerce is the loss of monitoring and other controls that are taken for granted in traditional commerce. Since e-commerce is inherently liberalizing by its nature, it can make a range of government policies to protect local markets redundant. For instance, no Caribbean country liberalized its insurance market in the GATS negotiations during the Uruguay Round (except for reinsurance in some cases). However, through e-commerce, it is possible for Caribbean citizens to purchase insurance services online from foreign suppliers. And even if this is prohibited by law, no mechanism exists for easy monitoring of such online activity. Generally speaking e-commerce will exert pressure on governments to liberalize traditional goods sectors especially if the products can be digitized. These issues are being faced by all governments but are particularly acute for small islands in which resources are limited and governments have historically played a significant role in the regulation of the economy.

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[53] However, note that foreigners are excluded from the book market in Canada under cultural exemptions so the competition is between a national consortium, Chapters, and individual booksellers.

II. 3 Indicators of Caribbean E-Commerce Usage and Activities

E-Commerce Activity in the Caribbean
At present, the majority of Web sites in CARICOM countries can be categorized broadly into the following areas:

?? Information sites (Caribbean-on-line, Bahamas-on-line)
?? Tourism and related services (hotels, car rental, cruises, transport, dive, other recreational activities;
?? Financial services (mainly in countries with offshore industries);
?? Management consulting for offshore firms (incorporation of companies, legal advice, accounting services);
?? Web design and hosting services;
?? Retail malls (music, handicrafts, Caribbean souvenirs, clothing, etc.)
?? Wedding services
?? Real estate (sale and rental of properties)
?? Chambers of commerce and industry organizations
?? Online auctions
?? Online gambling

In addition, several governments maintain Web sites of their ministries and departments or agencies. All of the government sites are passive not interactive. Neither is there much actual online transactions on the commercial sites; instead Web sites serve as advertising tools. In most cases, communication with the business entity is only by email or telephone. Some of the online malls accept credit card payments but deeper investigation reveals that the vast majority of backroom services such as authentication and credit card processing take place in foreign locations, mainly the US. Many Web sites are often not up-to-date and in many instances their links are no longer functional.[54]

II.4 Analysis of Caribbean E-Commerce Readiness

In order to obtain a broad overview of the status of e-commerce readiness in the Caribbean we will now examine policies at the national level that affect e-business. Perhaps, the most critical finding of this study is the lack of official information on the status of information technology in general, and on the level of computer literacy/use or Internet readiness in each country in the CARICOM region. Furthermore, most governments have little idea of the extent to which e-commerce is taking place in their domestic economy. There is no practice of collecting indicators of the digital economy in national census statistics or in other any form. Some governments have started to include computer use and Internet access data in national surveys (Barbados, Bahamas) and this data should become available in the early future. The best data are merely informed estimates from public utilities and economic agents (ISPs, Web site companies, etc.) who have an interest in this area. The information in this section of the report was gleaned from consultations with key people from the private and public sectors, and from exhaustive searches of Web sites as well as reports prepared by various committees in the mentioned countries.[55] As a result, some of the figures in this section may vary from the Internet-related data compiled by

[54] Note that although it was not possible to do so in this study, a useful analysis would be to assess the level of e-commerce on Caribbean sites in terms of the following categories: (i) information only; (ii) information with email address contact; (iii) order taking with offline processing; (iv) purchasing with automatic online processing; and (v) full integration with back-end systems.

[55] See List of Contacts Persons. However, not all the persons (from ISPs etc.) who were consulted in the research for this report could be listed.

the International Telecommunications Union (ITU) that is reproduced in Table 1 in a later section of this report. It is quite evident that every CARICOM government should begin to collect data on computer use and Internet access in order to inform their policy making regarding preparations for the digital economy.

ANGUILLA

Anguilla is a tiny island with only about 10,000 people. In light of the small population, it is not surprising that the focus is on online, offshore business or virtual presence, rather than greenfield investment.

Policy Framework

The Government of Anguilla hopes to position the island as a premier e-commerce site for offshore businesses, particularly financial service companies. On the domestic front, e-commerce in Anguilla is mostly business-to-consumer at the present time and no online banking is available as yet to consumers. However, there is a major focus on the financial services industry and the chairman of Hansa Bank, Lynn Bell has actively promoted Anguilla as a destination for e-commerce activities. The government formed a Task Force on e-commerce in March 2000 to assist the Government in developing and implementing a comprehensive legislative, regulatory and infrastructure development strategy for e-commerce in Anguilla. The intention is to diversify the economy and attract e-businesses. There is a recognition that e-commerce can be rapidly developed to complement the high-end tourism and the financial services sector. As well, Anguilla is somewhat renowned as a centre for cryptography[56] and some database management activities. The government has announced, perhaps prematurely, that Anguilla is open for e-business. Simultaneously, there is a major legislative program underway concerning business registration, financial services regulation, insurance, commercial litigation and securities regulation.

The present e-commerce focus is driven in large part by private businesses and firms also engaged in offshore financial services, banking and legal affairs, and consultants in the field of computer and technology. Additionally, the government is providing a significant level of support through its Ministry of Finance. The intention is to develop e-commerce as a new and viable industry. The scope for indigenous online business exists and many businesses already not only have a Web presence, but also have short term plans for the further development of their e-business potential. Foreign firms wishing to locate to Anguilla are also encouraged but there is no tolerance for Internet gaming/gambling or pornography.

Telecom/Internet Indicators

Anguilla connects to Antigua via a 2Mb/s pipe and Antigua connects to SprintLink somewhere in the USA (probably Washington). Modem access is limited to 49 kbps due to the limitation of lines. There is no B-ISDN, but DSL is available up to T1 over limited distances. High Speed wireless access is also available but quite expensive. Cable & Wireless provides dialup and leased lines. The dialup rates are the same throughout the Region, starting from EC$ 35 for 10 hours/month to EC$150 for 40 hours/month. Leased circuits with speeds from 64kbps to 2Mb/s via DSL are available but the rates are not published yet.

The percentage of households with computers in Anguilla is estimated at 25 - 30% or about 1000-1200 computers. Of these, there are about 400 - 500 households with Internet access. There

[56] An annual Cryptography Conference, usually held in Anguilla is organized by Offshore Information Services which provides Website hosting services; and Vince Cate (an American expatriate living in Anguilla) who specializes in encryption technology, is famous for opposing the US government's controls on the export of such technology.

are about 500 telephone lines per 1000 persons in Anguilla and Cable & Wireless is the main Internet service provider (ISP). Weblinks is another IT service provider that also provides high speed access to the Internet via wireless. Speeds on the island are 2Mbs and greater, but "offnet" traffic uses a smaller pipe. Weblinks tariffs are volume-based ranging from $100 - $500 per month.

There are over 600 Web sites in Anguilla, consisting of mainly small businesses but the offshore financial services sector is a separate category. Most businesses and all tourist and recreation services have Web sites. But Public Data is probably the only company registered in Anguilla that actually conducts e-commerce online. However, there are over 5 car rental companies doing active reservations online and several small businesses like Weddings on the Go provide wedding services to foreigners by advertising online. Some start-ups doing online day trading have not been very successful.

The typical cost of a credit card (Visa, Mastercard) transaction fee charged by banks in Anguilla is between 3.5 and 5%. Computer systems are duty free, however there is a 5% processing fee and the duty on software and computer parts is 25%.

It is hoped that e-commerce will be facilitated by Anguilla's Commercial On-line Registration Network system, (ACORN) which went live on November 16, 1998. It allows licensed company managers and trust companies in Anguilla, together with their approved overseas agents, to incorporate electronically under Anguilla's corporate and partnership legislation. In addition, users of the system can transact all other registry activities (and submit all other documents) electronically as allowed under the relevant legislation in respect of these types of companies.

ACORN is a state of the art companies registry system developed in Anguilla with the assistance of Companies House UK and the British Government. It allows the electronic incorporation and registration in Anguilla of: ordinary companies; international business companies; limited liability companies; and limited partnerships. Using ACORN, companies can be incorporated instantly from anywhere in the world 24 hours a day, 365 days a year. ACORN also enables all other corporate registration activities permitted under the relevant legislation to be undertaken on-line. [57]

It seems obvious that the government is promoting Anguilla's favourable taxation regime as a complement and stimulus to e-commerce. However, the OECD initiative to clamp down on offshore tax havens will require that Anguilla carefully plan its e-commerce strategy. However, the Government does not seem to have any specific ideas about the kind of e-commerce that locals can engage in. For all intents and purposes, e-commerce might remain an offshore activity with little indigenous input.

THE BAHAMAS

Policy Framework

As in other Caribbean countries, the Government of the Bahamas is apparently putting significant emphasis on the development of an information economy. The Government seems to be taking its cue from Bermuda and hopes to make the Bahamas a centre for e-commerce. However, it remains to be seen to what extent the plans and projections will result in substantial changes in the short term. In its most recent budget presentation, the Government pledged to ensure that the country become a knowledge-based economy and society and a centre of excellence for e-business.[58] To this end, it has included in its budget, funds to promote this

[57] See www.anguillaoffshore.com.

[58] See 2000-2001 Budget Communication presented by the Minister of Finance on May 31, 2000.

strategic goal. There are also various initiatives to modernize the telecom infrastructure to foster a digital economy.

The government has claimed that Internet access will be provided to all schools free of charge and will be funded by contributions from all licensed telecommunications operators on a proportionate basis. It also announced that computer training for adults will be provided through the schools on evenings. A training programme for teachers to become trainers will also be started shortly with an infusion of $1 million. In addition, customs duties on computers and related parts were eliminated in June 2000. The Minister of Finance also indicated that the Bahamian Development Bank will provide loans to small and medium-sized business for the purchase of new computer equipment for use in business.

Telecom sector

The Telecommunications Act of 1999 aims to liberalize the telecom sector and initiatives in this area have recently commenced. The privatization of Bartelco is scheduled to be concluded in 2000. In addition, a draft telecommunications sector policy framework is being considered by Government. The government sees its role as a facilitator of e-commerce but expects that the process will be driven by the private sector. Its role is to ensure that:

- the network infrastructure is in place
- the policy and regulatory environment encourages competition and facilitates the Internet
- Government operations and processes embrace the digital economy
- the education and training process prepares Bahamians to live and work in a digitised economy.

A steering committee of representatives from a broad range of private sector and government departments, and IBM Canada, assessed the state of readiness of the Bahamas in terms of the impediments and advantages of an e-business strategy. This resulted in a policy document on e-business which sets out in detail:

- the potential for e-business for employment and incomes in the Bahamian economy;
- the full range of policies, legislation and measures which the Government, in close consultation with the financial sector and the private sector generally, will implement to make the Bahamas a centre of excellence for e-business.

The Ministry of Finance is currently engaged in drafting e-commerce legislation which should be released in late 2000 or next year. It is believed that e-commerce will be critical to the further development of the services sector in the Bahamas, particularly the financial services and tourism industries. The local cable TV company, (Cable Bahamas Ltd.) is also developing an e-commerce initiative in Freeport with the intention of establishing a data centre. [59]

Internet/Telecom indicators

The Public Utilities Commission estimates that there are about 13,907 households with computers of which 12, 643 have Internet access. There are 1,961 businesses with Internet access. It is also estimated that approximately 50 companies are engaged in e-commerce but details are not available; and about 72 companies maintain Web sites hosted by local ISPs. Other companies have their Web sites hosted overseas but information is not available on them. There are 21 licensed ISPs but only 5 are operational. High speed modem access while available from one ISP, is not widely used at the moment. ISDN lines are not widely used but DSL lines are now being tested. Residential Internet access rates vary from $10.00 for 3 hours per month for the very basic service, to $250.00 per month for unlimited access. Commercial rates for Internet access range from $50.00 to $1,820 per month depending on type and speed of service. In addition, all ISPs charge installation or deposit fees.

[59] They also offer unlimited Internet access via TV on a trial basis for $19.00 a month, using a wireless keyboard and WorldGate technology which is advertised as "3 to 5 times as fast as a PC and modem connection to the Internet."

BARBADOS

Policy Framework

For several years Barbados has sought to develop information technology on the island with some success, albeit limited. There are several foreign firms located in Barbados that operate in the Information Technology (IT) sector. These include: Caribbean Data Services Ltd.; Caribbean Electronics Mfg.; Cirrus Logic, Clifford Electronics (joint venture); N A L Data Services Ltd.; Offshore Keyboarding; and Total Technology Solutions. The Government has a very proactive approach to facilitating the IT sector and with it, the promotion of e-commerce. Its IT policy spreads over many areas including Education, Tourism and Investment Development, Finance and its Legal framework. Through the Barbados Investment Development Corporation (BIDC) and its offices in major cities such as London, Toronto, Miami and New York the Government offers a package of incentives to facilitate investment which can include setting up business in Barbados but selling internationally. These include duty and VAT-free entry of raw materials and machinery, including computers. The Government also negotiates special telecomms rates with Cable & Wireless (C&W) for companies that operate in the IT sector. This can include a leased point-to-point line and special rates for call centres for in/outbound calls.

There is also a program (EDUTECH) to develop computer literacy skills at the primary and secondary level which is now in its fifth year. The Barbados Community College (BCC) and the University of the West Indies offer special courses in IT. In addition, the UWI Centre for International Services offers 6-month high impact programs in "hot" applications specific to a particular company with about 400 students trained so far.

The Government recognized that e-commerce has the potential to bring significant economic benefits to Barbados and has been a very active advocate of e-commerce in various forums. Barbados previously chaired the FTAA Joint Government-Private Sector Committee of Experts on Electronic Commerce and continues to participate actively in that process. At the national level, there is a committee on e-commerce that consists of public and private sector stakeholders that has studied the relevance of e-commerce to overall development strategy.

A draft Electronic Transactions Bill 2000 is expected to be introduced to Parliament later this year. It is based on UNCITRAL Model legislation and covers digital signatures, data protection and liability of e-commerce intermediaries, among other issues. The bill seeks to establish the legal environment for the conduct of electronic commerce and the processing of such electronic transactions.

Telecom sector

A new Telecommunication Act that will reduce the telecommunications monopoly and allow competition in some segments of the market is expected to be introduced in October 2000.
Government and business in Barbados see the high telecomm costs as a threat to the continued development of the offshore financial sector and e-commerce. The Government is in negotiations with C&W regarding deregulation and is developing the regime for dealing with the changes. A recent business survey stated that Barbados' international telecommuncation rates were among the highest in the Caribbean, and were 41% above those in Bermuda, the leading international business jurisdiction in the Region. Cable & Wireless (C&W), the monopoly provider in the Region, has been coming under increasing pressure to renegotiate monopoly agreements and provide more competitive international telecomm rates.

Telecom/Internet Indicators

There are no taxes on computer hardware, software and books on IT but the 15 percent VAT still applies. There are no official statistics regarding computer usage or Internet access but it is generally believed that about 4 percent of the population have Internet access. Due to the high cost of telephone calls, most Barbadians use the Internet for email to communicate with relatives overseas. (There are about 250,000 Barbadians domiciled in the US). Although there are no charges for local telephone calls in Barbados, consumers are not permitted to own their own telephones and basic rental fees are B$125 per month. There are about between 500-1,000 Web sites in Barbados and six ISPs including Caribsurf that is owned by C&W/Bartel. Internet access costs vary from B$10 -$200 per month based on scale of use. ISPs complain that when buying services from C&W they have to provide confidential information to what is in effect their competitor.

The infrastructure for e-commerce in Barbados is fairly developed but the lack of bandwidth in the "last mile" (between the consumer and the telecomms backbone) is a major problem. ISDN at 128 k is currently available but Barbados Telephone Company (Bartel) is testing ADSL and hopes to introduce this service in the near future. There are three E1 lines in the telecommunications grid but two are shared with other Caribbean islands so it is not as fast as desirable. People working in the Internet services sector indicate that it is possible to lease a T1 line from Bartel but the cost is prohibitive at between US$14-20,000 per month for business and almost double that price for resellers. There is also satellite communications but this does not extend to Internet access service. One ISP is in the process of gearing up to use VSAT technology for Internet access service. [60]

E-commerce issues

B2B e-commerce is almost non-existent in Barbados and most businesses cannot quantify the benefits of an Internet presence and hence are reluctant to incorporate IT in their operations.[61] There is also a preference for the paper medium and fears about digital and electronic media. Most e-commerce in Barbados is B2C and this is expected to increase.[62] However, many companies, particularly tourism-based establishments, have Web sites that advertise their services but they do not conduct any business online. As a result of the high cost of Internet service, many firms choose to host their Web site in Miami or another US location.[63] For instance, the auction site *GoBajan.com* is hosted in California. Neal and Massy is interested in hosting e-business sites and providing access to a payment gateway but the hardware and software costs are high and the company is not sure it can depend on having the bandwidth from Bartel.

The banking sector is reluctant to process online transactions and merchant accounts are difficult to obtain so startup e-commerce firms are seriously constrained. For the moment, anyone doing online transactions is forced to use foreign application service providers (ASPs). A few firms are doing manual clearance of credit card transactions. As a result, Caricard, a local company is

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60 C&W has indicated that it is in the process of increasing the capacity of the Eastern Caribbean Fibre System from 4 gigabytes per second (Gbs) to 16 Gbs but it is not clear how soon the benefits of that increased bandwidth will reach consumers.

61 Automotive Art, an auto accessories and paint company operates a network with their franchises in 10 Caribbean countries through which their company database can be accessed and supplies can be ordered and tracked online. But payment is manual because of the lack of authentication services for credit card payments. The online component of their business accounts for less than 10 % of their total business.

62 There is even a supermarket, JB's Supercentre through which groceries can be ordered online but paid for manually.

63 Creative Junction, a small firm that designs and develops Web sites, indicated that they usually host Web sites in Miami through Rapidsite owned by Verio.

attempting to set up a payment gateway to facilitate authentication and payment services for e-commerce firms. [64]

BERMUDA

Policy Framework

It is instructive that Bermuda is the first country in the world to include e-commerce in the portfolio of a Cabinet Minister, and one of the first to pass e-commerce legislation (in 1999), giving legal substance to electronic data and transactions negotiated over the Internet. A Code of Conduct for Internet Commerce was introduced in July 2000 which exhorts business to: observe business integrity; protect personal data; avoid abusive usage; advertise truthfully; deal fairly and openly with customers; and settle disputes and complaints quickly and fairly. Furthermore, it is clear from the government's open and transparent approach to e-commerce that it is serious about the development of this sector. The stated purpose of the e-commerce regulations of the Bermuda government is:

- To permit and encourage e-commerce through the operation of free-market forces
- To promote the greatest possible degree of self-regulation by the industry
- To ensure that e-transactions are flexible and technologically neutral

The Electronic Transactions Act is based on UNCITRAL's Model Law on Electronic Commerce but also draws on a variety of sources such as the European Directive on electronic signatures and safe harbour principles relating to data protection, Australian, Canadian and American statutes and Singaporean legislation.

The e-commerce initiative was jointly developed by government and the private sector, which traditionally is the way that Bermuda works. Local businessmen have seen the opportunities in e-commerce and have set up companies. This is how the insurance and international financial sector was built up over the years. The major banks, Bank of Bermuda and Bank of Butterfield are heavily involved in e-commerce particularly on the payment of funds. It is now possible to transact e-business using over 20 different currencies and the banks are partnering with different companies, particularly in the facilitation of payments. Since 1999 Bermuda's banks have been able to securely transact over the Internet using custom software applications and virtual private networks, which include security coding, export controls and fraud protection. [65]

There are no income, sales or capital gains taxes in Bermuda and over the past 20 years many businesses have been attracted to Bermuda because of the expertise available for support services, banking, legal and accounting professionals. Bermuda is not on any list of tax havens recently published.[66] Bermuda's laws are open and do not allow money laundering, gambling or proceeds from sale of weapons. In addition, Bermuda cooperates fully with all international regulatory bodies which ensures its recognition as a good place to do business and this adds a certain cachet to those wanting to set up a company offshore.

Telecom sector

The telecommunications industry in Bermuda was deregulated in the mid-1990s after 107 years of Cable & Wireless' monopoly with compensation by government to the company. This led to a massive upgrading of telecommunications infrastructure by the new company, TeleBermuda International. There is a great deal of bandwidth on Bermuda? estimates put the total bandwidth

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64 Caricard is in the process of developing a special payment system for JB's SuperCentre to offer online payment to their customers through a special card processed through Mutual Bank.

65 See *Government Technology*, March 1999 for a special report on e-commerce in Bermuda. (www.govtech.net/publications/eCommerce/mar99/bermuda/bermuda.shtm)

66 In June 2000, the OECD concluded that Bermuda, Cayman Islands, Cyprus, Malta, Mauritius and San Marino are not "harmful tax jurisdictions.

at about enough for 15 million simultaneous voice or data transactions? and the cable linking Bermuda to the North American network is reportedly capable of carrying 1.2 million long distance telephone calls simultaneously. Both Cable & Wireless and TeleBermuda International provide long distance service and the government policy was recently changed to allow ISPs to provide Voice over Internet Protocol (VOIP). The Government claims that Bermuda's telecommunications costs are the lowest of all Caribbean countries and prices will continue to fall.[67] There is now wireless access provided by one of the ISPs and the Internet access speed has greatly improved. Bermuda accesses the rest of North America through the long distance carriers who have plenty of high-speed bandwidth. Also, with the new cables presently being completed, Bermuda will have direct links with South and Central America, in addition to the current ones with Europe. Further, 360 Networks of Vancouver have recently taken over TeleBermuda and they are in the process of laying undersea cable in many parts of the world.[68]

Telecom/Internet Indicators

It is not surprising that Internet access is very high compared to the rest of the Caribbean. The ITU reports that there are 44 Internet hosts per thousand of inhabitants and 39 % of Bermuda's population use the Internet. There are only 3 ISPs [69] but the island is very well supplied with online information on a range of activities. The Web site *bermuda.com* is a gateway to information on every aspect of economic and social life in Bermuda, including schools and employment opportunities. There is even a chat group and links to almost every type of business in Bermuda. When compared to "national Web sites" in the CARICOM region, Bermuda seems far more developed and sophisticated in terms of the use made of the Internet for providing tourism information and general and commercial information. It is an indication of the status of Internet usage in Bermuda and of Bermuda's presence on the Internet.[70]

The high Internet connectivity of Bermuda is in spite of the high cost of telecommunications generally. It may reflect the general high-income status of the economy but there are many critics of the system. In fact, in June 2000, twenty hours of dialup Internet access cost US$44.00 per month with an additional charge of $2.70 for each excess hour. For unlimited access per month service Bermuda businesses and residents pay more than US$ 850.00 a month. The bandwidth is sometimes very slow and although ISDN is available, it is apparently prohibitively expensive. [71]

Much of the success in the telecommunications and e-commerce areas are due to bold and forward-looking government policies. In the 1990s economic planners created a vision of an "information island."[72]

Information on business-to-business (B2B) e-commerce in the offshore industries is not available but it is reasonable to assume that this must be a very vibrant sector because of the multitude of offshore bank and other financial companies registered in Bermuda. There are about 50

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67 Bermuda, with a population of about 60,300 people, is not really in the Caribbean but most comparisons are with the Caribbean countries. It is approximately 6oo miles due west of North Carolina.

68 In November 1998, *Wired* magazine rated Bermuda as one of the three most wired countries, with one third of adults online. It also has one cellular phone for every six people, and more satellite dishes and personal computers per capita than most developed countries. Government sources indicate that 51% of households have computers as well as Internet access and there are 500 telephones per 1,000 people in Bermuda.

69 North Rock Communications registers domain names free of charge. Personal home pages are free to all of its members and as such these pages may not contain commercial content of any kind. There were 30 personal home pages on June 15, 2000.

70 For instance, the accommodation page on *bermuda.com* received 83, 855 hits from March 23 to August 20, 2000.

71 See "Internet access costs in Bermuda are very expensive" at: http://bermuda-online.org/internet.htm

72 The seminal policy document in the early 1990s was the Waldon-Hughes report entitled, "Bermuda: The Information Island."

companies in Bermuda that are active in e-commerce to consumers. Bermuda is also the only offshore jurisdiction that has local partners working with First Data Corporation, the largest third-party credit card processor in the world. Concert, the joint venture between AT&T and British Telecom,[73] plus many of the top re-insurers in the world are located in Bermuda. Concert deals with the top 500 Fortune companies to provide telecommunication services on a worldwide basis. [74]It was announced in June 2000, that Bermuda-based Quo Vadis will team with Nasdaq-listed e-security group, Baltimore Technologies, to design a complete security infrastructure for offshore e-business. This illustrates that Bermuda is ahead of most of the competition in the race to be the leading offshore jurisdiction for e-commerce development in this hemisphere.[75]

OECS COUNTRIES

Policy Framework

In the OECS sub-region, the five (5) governments committed to the OECS Telecommunications Reform Project (Dominica, Grenada, St. Kitts and Nevis, St. Lucia and St. Vincent & the Grenadines) are already in the process of passing the required legislation to further the process of reform of the telecommunications sector. They will also establish the legislative and regulatory framework and the institutional structures for such telecommunications reform. At the May 18-19, 2000 meeting of the OECS Heads of Government, the Treaty Establishing the Eastern Caribbean Telecommunications Authority (ECTEL) was signed and it was agreed that the headquarters of ECTEL would be in St. Lucia.[76] There is a draft Telecommunications Bill and an OECS Telecommuncations Sector Policy that aims to increase investment and penetration of telecommunications goods and services in the sub-region. There is also a consensus that there is need for greater competition in this sector, as well as protection of consumer interests and the prevention of abuse by dominant monopoly operators. It is significant that the intention is to grant non-exclusive licences to operators.[77] The national governments also intend to allow private networks using V-SAT and to ensure inter-connection is permitted to the Cable & Wireless network.

The liberalization process is for the five countries and Grenada and St Kitts and Nevis have already passed legislation. Early in May 2000, the Grenada government announced plans to open up competition in its energy and telecommunications markets. The government announced that "investors have been lining up to service the Grenadian market". Among the companies seeking to enter the Grenada telecom market are Choose.com from Trinidad and NetServe from Canada.

In conjunction with the pro-competitive reform of the telecommunications sector there is a major policy focus on Internet access and connectivity. Under the new common OECS policy, Internet access will be considered a basic service and there is a plan to establish community access points or kiosks and the use of post offices to provide Internet access. The new focus on connectivity and e-commerce is commendable but it remains to be seen whether it can be implemented.

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[73] The two parent firms own Concert equally. It includes their existing international networks and traffic, their international products for business customers, their multinational accounts in selected industry sectors and other assets. As well, the headquarters of major telecommunications companies such as FLAG (fibre optic link around the globe), Global Crossing and Project Oxygen are located in Bermuda.

[74] Concert IP Services offer: high speed IP wholesale services; high speed wholesale bandwidth services; managed IP; corporate solutions for business users; advanced Internet security services.

[75] QuoVadis was founded in 1999 by Tony Nagel, former CFO of TradeCard, an Internet startup specialising in trade finance, and Bermudian Stephen Davidson, to develop an offshore digital Certificate Authority to issue digital certificates for secure e-commerce. (www.tax-news.com/html/)

[76] Note that Antigua and Barbuda is not a party to this initiative.

[77] See Model Telecommunications Bill, 2000 (June 29, 2000) and the draft OECS Telecommunications Sector Policy (May 26, 1999).

Telecom/Internet Indicators

Information on computer use and Internet access in individual OECS countries is very difficult to obtain. Although e-commerce is largely nascent in the OECS, there is online gambling in Grenada and Antigua at the moment and this is a very contentious activity in the former. Some enterprising individuals have started various initiatives to sell products online.[78] However, they face significant constraints due to the cost of telecommunications and the poor service provided by Cable & Wireless. For instance, a start-up company interested in setting up a call centre in Grenada that approached C&W to lease a dedicated T-1 line with a mid-point connection to Toronto was quoted EC$80,000 per month. So, the company has decided to use wireless service instead, provided by Netserve USA from Miami for about half that price. [79]

As in the wider Region, the cost of credit card transactions is a major constraint to SMEs doing business online in the OECS. For instance, participants in a seminar on e-commerce in St Lucia (July 8, 2000) reported that in discussing credit card authorizations for e-commerce transactions, local banks wanted security deposits ranging between EC$250,000 to $500,000! They also pointed out that the absence of a facility to have credit card authentication is seen as a bigger problem than even the cost of telecommunications. Another problem identified was the lack of trained personnel for Internet-related and e-commerce activities.

JAMAICA

Policy Framework

Under the WTO Agreement on Basic Telecommunications Services, the Government committed to market access and national treatment for enhanced services, including Internet access, mobile data, PCS and paging services, satellite-based video transmission services (excluding video telephony), and telecom equipment, sales, rental, maintenance, connection, repair and consulting services. However, voice telephony was exclusively reserved for CWJ until September 2013. But in 1998 the government announced their intention to open competition in wireless and interconnection services.

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78 One firm that advertised traditional "cocoa sticks" for making hot chocolate on its Web site was taken aback by the incredible response in terms of orders. They had to shut down that portion of the site on the third day of operation because they could not meet demand.

79 On July 23, 2000, Cable & Wireless announced reductions of up to 60% (effective August 1st) for Internet access service under a new initiative called Internet Direct Connect for Barbados, the OECS, Cayman Islands, Turks and Caicos, Anguilla, Montserrat and BVI. However, the reduction would only apply to those customers who have been identified by the governments as being informatics companies. But since the original costs of services are not known, it is not clear whether the rebate is meaningful. Furthermore, it appears to be only for businesses that use Cable & Wireless' ISP and this saving will most likely not be available to competing ISPs who depend on Cable & Wireless for trunk lines. There are severel elements in the package: a port on the Cable & Wireless Internet platform and a frame relay or private circuit connection between the customer's site and the platform. Cable & Wireless can support speeds from 64 kbs to E1 (2048 kbs) depending on the bandwidth requirement of the customer. (*CANA Business Interactive*, July 24, 2000).

The government is putting great emphasis on the information technology sector and the establishment of the Caribbean Institute of Technology was the first step.[80] Other initiatives include efforts to install computer labs in schools and train teachers in computer applications, the creation of the Information Technology Advisory Council, and the phased liberalization of the telecommuncations sector.

There is no clearly enunciated or official e-commerce strategy in Jamaica but there is a multi-stakeholder committee made up of volunteers that has been considering what is required to facilitate e-commerce. To date, studies have been commissioned on various aspects of e-commerce. There have been consultant reports on the necessary legal environment, privacy and security issues, and on the telecommunications infrastructure requirements. The legal study looked at the UNCITRAL Model Law on Electronic Commerce and recommended that a consultant be contracted to draft legislation. The terms of reference have been drawn up and this is out to tender. The security and privacy paper examined general concerns, and also called for a consultant to work along with the legal consultant. The telecommunications paper recommended the introduction of frame relay or ATM to provide bandwidth and speed, but this depends on CWJ anyway.

One of the main problems is that the committee is a part time committee of volunteers, with no specific funds allocated. As a result, there is no clear jurisdiction and no institutional leadership to expedite the process of creating the enabling framework for e-commerce development in Jamaica.

JAMPRO is attempting to position Jamaica as one of the leading locations for e-commerce and has set up the Jamaica Trade Point project which is described as "the electronic umbrella that provides a gateway to global marketing." It encourages the participation of local companies in international trade through greater use of the Internet. In addition, companies will be able to access other services such as finance, insurance and shipping. There is also a planned pilot e-commerce project with US Government support to develop a private sector-run telecenter model to provide Internet access to the public for social and business purposes.

Telecom sector

The telecommunications network is completely digital and includes fibre optic lines in Kingston. The rural system is also relatively modern, using a 90 Mbs cross-island digital microwave transmission system. Jamaica's international telecommunications traffic is transmitted via a number of submarine fibre optic cable systems, such as the Trans-Caribbean Fibre Optic Cable System and a Jamaica-Cayman Island optical fibre cable link, as well as satellite earth stations with access to INTELSAT Atlantic Ocean satellites. The Jamaica-Cayman cable links the Cayman Islands to Jamaica and provides fibre connectivity between Montego Bay, Ocho Rios, Port Antonio and Kingston. In 1998 the system was capable of carrying 32,000 calls simultaneously, but this needs to be upgraded to major handle broadband services. Following the completion of the fibre optic cable, Jamaica Digiport International (JDI) also began offering all network services available to business customers in the United States to its free-zone customers.[81]

As in all other CARICOM states, the situation in the telecommunications industry is a major constraint to the rapid and extensive use of the Internet by businesses and consumers. In 1998,

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[80] Microsoft Corporation, in Jamaica since 1999, has expressed a positive interest in the prospects for the computer applications sector within the framework of the opening up of the telecomms sector. However, Microsoft has expressed concerns over the high rate of computer software piracy in the country, estimated at 70%.

[81] U.S. Department of Commerce, Office of Telecommunications Technologies, *Jamaica Country Profile*.

Cable & Wireless Jamaica (CWJ) replaced Telecommunications of Jamaica as the sole provider of the island's domestic and international telephone services under a licence granted by the Jamaican government.[82] The Government seems determined to allow competition in cellular, wireless and value-added services and in 1998, it required Cable & Wireless to allow companies providing such services to interconnect to its network. The new telecommunications reform legislation will dismantle the current CWJ monopoly over a 3-year period, allowing for eventual open market competition in the sector.[83] The Jamaican government expects prospects for information technology development (IT) to improve as a result of the planned liberalization of the telecommunications sector.[84]

The high cost of telecommunications services in Jamaica is another critical factor constraining the development of the information technology industry and e-commerce in particular. While the three-year phase in of competition is a positive step, it will still be a constraint on the development of e-commerce. Furthermore, Jamaican banks do not have the capability to verify credit cards online and there is no timetable when this facility will be available. This is a serious impediment to any e-commerce development.

Telecom/Internet Indicators

There is a very vibrant Internet environment in Jamaica and demand for Internet access is growing steadily. There are 20 ISPs on the island and community Internet services are beginning to appear. However, it is estimated that only 3% of homes in Jamaica have Internet access. It is understood that CWJ is in the process of installing a new N3 node which should significantly increase the e-commerce readiness of Jamaica in terms of infrastructure. There are many Jamaican companies on line including tour agencies as well as some food companies (Tours To Go, Ochie.com, Lasco Foods, etc). They appear to target the vibrant and relatively large pool of Jamaicans living overseas. The *Jamaica Gleaner* has an online shopping mall called Go-Jamaica that sells a variety of local products. There is apparently great potential for e-commerce in Jamaica but the appropriate technical and regulatory infrastructure have to be put in place first.

Competition Issues

As in the entire Caribbean Region, the cost of Internet access and supply side constraints are major problems. In addition, there are other problems in terms of competition in the provision of Internet access services. For instance, there are no government regulations controlling how CWJ provides itself, as against its competitors, with telephone lines to supply service to Internet customers. This is a major constraint to the growth of Internet users. Local ISPs have concerns about cross subsidization by CWJ of its Internet service with proceeds, assets, employees, and communication links from its other well-established services.[85]

Meanwhile, independent Internet service providers (ISPs) struggle to supply competitively priced services, with no protective measures other than engaging CWJ in expensive litigation to ensure an adequate supply of telephone lines. An obvious solution to this problem is the use of alternative technologies such as Very Small Aperture Terminal (V-SAT) equipment to relay data internationally. However, it appears that the use of V-SAT by ISPs is frowned upon by CWJ who has tried to prevent this. The lower cost and the faster speed of V-SAT technology are two

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82 Jamaica Digiport International (JDI), a joint-venture between CWJ (65%) and AT&T (35%), provides high speed data and other telecommunications services exclusively to free trade zones and offshore companies.

83 Already the cellular market has seen results, with two domestic cellular licenses being auctioned to Cellular One Caribbean of St Maarten for US$45 million and to Ireland's Mossel for US$47 million.

84 The government provided support to IT expansion on the island with a US$350,000 grant to provide computer, Internet and technological support to small and medium-sized enterprises.

85 A similar problem exists in Belize.

compelling reasons why it is popular in Jamaica especially when compared to what CWJ offers ISPs in terms of an international leased line connection.[86] ISPs argue that if they are not to be allowed to relay telephone traffic then CWJ should also be limited in dealing with ISPs particularly in competitive areas such as Internet access and all areas of future competition.

TRINIDAD AND TOBAGO

Policy Framework

All basic telecom services are provided by the monopoly operator, Telecommunications Service of Trinidad and Tobago (TSTT). TSTT was granted a 20-year exclusive license in 1989 to provide local, domestic and international long distance services. The Government of Trinidad and Tobago has committed to allow full competition in the basic services market by 2010 under the GATS. However, the government has been considering a means to allow competition in the telecom sector and it is likely that it may license additional basic telecom services providers in the next two years. The present regulatory provisions are outdated and do not cover newer services, such as personal communications service (PCS) and V-SATs. There is a draft telecommunications bill which aims to modernize the sector but details are not available and it is unlikely that it will be introduced in the Parliament before the national elections that may be held in 2000. Liberalization of the telecom sector will require a negotiation among the shareholders of TSTT to modify the shareholders agreement. [87] The challenge is to get C&W to agree that the external market in particular should be liberalized immediately although TSTT has a guaranteed monopoly until 2010.

Competition is allowed in the paging, trunked radio, value-added services, cable television, TV and radio broadcasting, and satellite services markets. The Government announced plans to license a cellular operator to compete with TSTT in February 1999 and bids were accepted in mid-2000 but there is a controversy about the lack of transparency in the allocation of licences. Popular rumour indicates that the incumbent cable TV monopoly (Transcable) is testing cable modems for use in supplying Internet access. An important requirement will be external access that bypasses TSTT, which raises the question of liberalisation. At the same time, TSTT is engaged in testing both frame relay and ASDL technologies and has applied for a cable TV license to also support this wide band requirement.

Telecom/Internet Indicators

In spite of having the most liberal regime for imports of computers and related equipment in CARICOM, the use of computers by households is still quite low by North American standards. However, computer literacy is rapidly increasing and many people have access to the Internet. Various types of computer-related training courses are provided by the private sector through commercial schools and institutes. Data from the Chamber of Commerce indicate that more than 70 percent of their 700 members have some type of Internet access, ranging from simple email to Web sites with the company's own domain name.

The opportunities and challenges regarding e-commerce in Trinidad and Tobago are quite similar to the rest of the Caribbean. In particular, the high cost of Internet access and the low use are major concerns. The table below gives some indication of Internet readiness and reveals the prohibitive cost of access for business purposes? a dedicated T1 line costs about US$34,000.

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[86] See articles on telecommunications issues by Jens Winton for the *Daily Observer* newspaper between February 3, 1997 to November 22 1999 at: http://www.colis.com/telecom/

[87] The Government owns 51 % of the shares and Cable & Wireless holds the other 49 %.

In June 2000 there were six ISPs in Trinidad and Tobago[88] but no full e-commerce service provider. Some carnival bands appear to offer full business-to-consumer services but they are hosted in the US and rely on American application service providers (ASPs) for credit processing and authentication services. The local banks are not investing in the software systems to enable on-line financial transactions but promise to be e-commerce ready in one to two years. Some insurance companies have recently started advertising on-line insurance applications but backroom processes are manually conducted. At the moment it is very difficult to conduct e-commerce from Trinidad and Tobago. See the case study of Sacha Cosmetics in Section III.2.

Summary of Internet Access Data for Trinidad and Tobago[89]

Dial up Internet access cost (TT$)	$80 for 20 hrs up to $800 for unlimited access
Monthly dedicated access cost 64 k T-1	 $10,000 $206,000
Approximate no. of dial-up lines (business and private)	35,000
Number of dedicated access lines	55
No. of email accounts (private and business – issued by local ISPs	60,000

In the meantime, while the Government aims to promote information technology, there is a major focus on call centres. A joint venture between the Gillette Group and Canada's ConnectOne Management Group started up in July 2000. The call centre cost US$36 million to establish and employs 700 telemarketers who sell the services of US companies by telephone to customers around the world. Two other centres are planned for next year, most likely in Central and South Trinidad which are expected to increase total employment to 3,000.

E-Commerce Committee

In June 2000, the National Electronic Commerce Policy submitted a report to Cabinet on the status of e-commerce in Trinidad and Tobago and made several recommendations for government intervention to improve the facilitating environment.

Among various wide-ranging initiatives to promote e-business, the Committee recommended the creation of a National E-Commerce Coordinator and a secretariat to continue the development of a comprehensive Policy Framework on E-Commerce. It also recommended that the Government: transform its operations through the use of the Internet; address the inadequate telecom infrastructure through increased competition;[90] introduce legislation to deal with electronic transactions, and online security; extend intellectual property protection to digital content; and provide training to build up computer and IT skills in the country. The Committee also recommended the creation of a portal to provide services to micro and small and medium enterprises (MSMEs) for e-commerce. The report was apparently accepted by the Cabinet but no official statement regarding implementation of the recommendations has been announced.

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88 These include: wow.net; rave; opus; trinidad.net; carib-link, tstt.net;

89 Based on dated collected from ISPs by Ministry of Trade, Industry and Consumer Affairs, April 2000 and published in "*Preparing Trinidad and Tobago for Doing Business in the Internetworked Global Digital Economy*," June 2, 1000.

90 The report pointed out that there is a total of only 8 E-1 (16mgbs) lines in TSTT's network while a small firm in Miami can have as much as 41 mgbs.

The following draft bills are expected to facilitate e-commerce: The Computer Misuse Bill; and The Electronic Transfer of Funds Crime Bill. The first appears to address computer security issues. The second addresses credit card fraud but apparently does not deal with electronic contracts or digital signatures.[91]

Comparative Regional Overview

An attempt was made to describe the status of Internet use and e-commerce activity in the countries above. However, it is difficult to make any comparative analysis because of the data gaps. What is evident is that most of the MDCs are at some stage in developing an e-commerce strategy and considering or drafting legislation to facilitate electronic transactions. The policy framework in the OECS countries and Guyana, Belize and Suriname is much less developed. It also appears that the MDCs are merely attempting to play catch up on the policy/regulatory framework front while the other countries are significantly entrenched in the digital divide phenomenon vis-à-vis North America. On the other hand, Bermuda seems quite focused on using e-commerce to complement its other offshore activities and increase economic opportunities. It is also not surprising that is the most connected society of the group and Internet users as a percentage of population is 39.1% (See **Table 1** in Section III.3).

At the regional level, it is fair to conclude that much work needs to be done to educate CARICOM citizens about the use of information technology in general and to promote e-commerce as a new means of doing business. In their domestic jurisdiction, governments must begin to act in significant and substantive ways on the plans and promises to bring their societies into the digital world and to facilitate e-business.

[91] The bill aims to "regulate the transfer of money through an electronic terminal by means of a card for the purpose of instructing or authorising a financial institution to debit or credit a cardholders account when anything of value is purchased."

SECTION III DEVELOPMENT IMPERATIVES FOR CARIBBEAN E-COMMERCE

III.1 E-Commerce Development Pre-requisites

The World Trade Organization (WTO), the Organization for Economic Cooperation and Development (OECD), UNCTAD, WIPO and various commentators have outlined many different types of policy issues related to electronic commerce. These include development and access to the global Internet infrastructure, taxation, content regulation, privacy, security, protection of intellectual property, and jurisdictional issues, among others. The WTO identifies eight principal policy challenges raised by electronic commerce:

- ?? standards for the emerging global telecommunications infrastructure;
- ?? adequate investment in the infrastructure;
- ?? user-friendly and broad-based access;
- ?? a predictable legal and regulatory environment which enforces contracts and property rights;
- ?? the security and privacy of information;
- ?? rules for dealing with what constitutes unacceptable or conditionally acceptable content;
- ?? a predictable framework for taxation and financial regulation; and
- ?? equality of opportunity through better access and education for those least well-placed to adapt to the new environment.

We will consider these and related issues in this section with a focus on (i) the physical infrastructure; (ii) financial infrastructure; (iii) regulatory environment; (iv) human resource base; and (v) other issues.

The Physical Infrastructure for E-Commerce

In order for electronic commerce to take place, buyers and sellers must have access to hardware and software for digital information flows and to communication networks. Perhaps the most critical element is the telecommunications infrastructure and a range of government policies which may affect the cost of and accessibility to that infrastructure. The Internet is the backbone on which all e-commerce runs and Internet access is critical to the continued evolution of e-commerce. For the sake of simplicity, the infrastructure needed to facilitate e-commerce can be divided into five parts:

1) hardware (such as personal computers, modems, servers, and routers);
2) telecommunications networks;
3) network service providers or Internet service providers (ISPs) to connect individuals or businesses to the network;
4) software programs to run the hardware and electronic commerce packages; and
5) ancillary services (such as Web design and development, advertising, delivery/ courier, credit card, and authentication/ certification services).

The Need for Competition

The critical need for competition to ensure access to services and the dissemination of leading edge telecom technologies cannot be overstated. The US approach is instructive in this regard:

> The Administration's pro-competitive market driven approach to broadband deployment is producing the desired results. The Telecommunications Act of 1996 opened up monopoly telecom markets and allowed for the emergence of new competitive players. As competition emerges between telephone companies and cable companies, between wireline and wireless providers, companies are investing in and building out high speed, broadband networks of the future. Competition among equipment suppliers and service providers is driving the innovation that is extending the reach of these technologies, lowering their prices, and making them easier to install and use.[92]

As discussed above, in order to ensure that the Region benefits from the efficiency and cost savings that stem from new telecommunications technology it is necessary to have competition in the provision of all services.

Universal Access

In the Caribbean it may be argued that the most critical constraint to universal access is the cost of Internet access and telephone services. The most important issue in universal access is to find a mechanism to allow all sectors of Caribbean society access to the Internet. As the US government indicated, the "digital divide" is very real. Rich and urban households are more than twenty times as likely to have access to the Internet than rural households at the lowest income levels.[93] The same problem exists in the Caribbean and the challenge is greater in this Region because the capital resource base for providing the infrastructure for Internet access is extremely limited. As a result, policymakers have to find creative solutions.

There is technical assistance and funding from various international agencies and governments should explore this avenue. It is noteworthy that an IDB-financed Technological Innovation program for Guatemalan Microenterprises includes the installation of Community Information Centres with Internet access. Through this mechanism, even small business people who cannot afford telephones or computers will be able to access information and government services such as export permits.[94] In many cases, in the short term it would be best to provide computers in schools and community centres or subsidize Internet cafes where the public can access the Internet for an affordable price. But in the long run, governments need to ensure that the technology and equipment such as personal computers and software become standard in most households. Several Caribbean governments have announced their intention of providing Internet access to the public and they should implement those plans as soon as possible. In the OECS, governments are considering revitalizing the post offices by turning them into Internet centres and there is a similar consideration in Jamaica. While e-commerce may not be the direct goal of such programs, the development of an information technology culture is critical to future development.

Financial Infrastructure

Electronic Payments

A supportive and responsive electronic payments infrastructure is critical to e-commerce. Electronic payments require an easy-to-use and secure payment system. This is particularly important for B2B transactions in order to benefit from the cost reductions associated with e-commerce. In addition, security for financial transactions is critical. Electronic payment must be secure and legal with liability clearly identified, limited and prosecutable. Eighty percent of e-commerce transactions are based on credit cards but debit cards, smart cards and digital cash or "cyber cash" are now being considered. Another element in the payment regime is rapid

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92 *Towards Digital eQuality*, p. 13.
93 *Towards Digital eQuality*, p. 6.
94 *IDB America*, May-June 2000, p. 26.

authorization, payments and settlement of accounts through the financial system of any economy. Moreover, authorizations for transactions between e-businesses and payment institutions (credit card companies or banks) must be in real time to allow for immediate delivery of digital products. Furthermore, the shorter the time lapse between authorization and actual payment, the lower is the risk to the financial institution.

The banking system in every economy must adapt to the needs of e-commerce. In order for online sales to take place e-businesses need merchant accounts and they need facilities for processing credit card transactions or some method of electronic payment at reasonable cost. Unfortunately, this may not be available to SMEs and micro-enterprises in the Caribbean, or may be too expensive because of the small size of economic agents but other mechanisms can be developed to facilitate them. In the same way that portals such as Yahoo and AOL provide a range of services to businesses and individuals all over the world, the Caribbean Region needs indigenous portals and application service providers (ASPs) to fill the gaps in the banking system and to allow small firms to conduct business online. In most OECD countries, ASPs are providing indispensable services to firms involved in e-commerce.

The Regulatory Infrastructure for E-Commerce

As the Internet expands and electronic commerce transactions mushroom, there is significant potential for abuse due to the impersonal, almost unaccountable, nature of the medium. The vast distances that can separate purchaser and vendor have led to concerns about consumer protection and the right to redress. The issue of privacy of personal information stored in databases accessible through the Internet has similarly led to calls for regulation of the Internet in general and for electronic commerce in particular. The need to safeguard the public interest is thus uppermost among the concerns of governments. At the same time, a desire to promote and protect private interests is not always wholly absent from regulatory impulses, nor is devotion to national as opposed to universal interests. The differences between these are not always clear and this fact ensures that discussion will be lively. One clear area in which government intervention may be necessary is the control of socially undesirable content in e-commerce such as child pornography, hate literature and violent and demeaning threats to any groups or individual.

It is accepted that the further development and refinement of the Internet is continuing at a rapid rate. In many cases, technological solutions would address some of the problems that are currently being discussed. Indeed, many of the issues regarding e-commerce and the Internet medium today may be only of academic interest in the future. New software is constantly being developed which may solve some of the issues, for example, privacy protection. This means that governments' approach to e-commerce must be flexible and capable of being easily adapted to the changing environment. Nevertheless, there are some areas in which appropriate governmental regulations can help to boost confidence in e-commerce.

Digital Records and Contracts

Traditional rules and regulations for conducting business deal with a world of paper, physical products, and retailing within national borders. E-commerce may require an evaluation and updating of the commercial codes that govern business transactions. In order to fully facilitate electronic commerce, these codes must incorporate the digital environment. In the long term, the harmonization of such commercial codes across CARICOM may be necessary in order to create a common regime for commercial practices that might address issues such as the legal recognition of electronic signatures, acceptance of electronic documents by the courts, enforcement of contracts, and commercial pricing practices, among others.

The main challenge in terms of the regulatory framework for e-commerce is to introduce legislation that neutralizes technology-related constraints in domestic laws that restrict or prohibit the legal acceptance of electronic documents. The tradition in English common law on which most legal systems in the Region is based is hand-written signatures and witnesses. For instance, contracts and record keeping have always been based on paper documents and the courts rely on written documents for evidence to enforce contracts and adjudicate on all matters. However, the digital environment and marketplace make the notion of physical presence and the reliance on physical records somewhat redundant. E-commerce requires the use and adoption of an alternative medium of transacting business out of sight? the paperless medium. This new method does not in any way replace or alter the traditional rules on paper-based communications in relation to specific matters such as contracts, conveyances, wills, trusts and documents of title. But national laws must generally accept electronically recorded documents in matters where formerly writing was required.

For e-commerce to develop there is need for legal recognition of electronic records including: writing; delivery; signature; retention of electronic records; and the admissibility and evidential weight of electronic records. These elements require a radical new approach and must be enshrined in new legislation and the updating of current legislation to facilitate electronic records. The legal acceptance of digital signatures and electronic contracts is the most common aspect of the e-commerce environment and this can impact on various laws ranging from the setting up of companies, landlords and tenancy relationships, bankruptcy, income tax, bill of sales, insurance, among others. The UNCITRAL Model Law on Electronic Commerce is a useful starting point on which national legislation can be developed. Indeed, legislation in Bermuda, the Cayman Islands and the draft legislation in Barbados, Trinidad and Tobago are based on the UNCITRAL Model.

Jurisdictions with e-commerce laws recognizing digital signatures and electronic contracts
August 2000

Argentina	Australia	Bermuda	Canada
Cayman Islands[95]	Chile	Colombia	Denmark
Finland	France	Germany	Hong Kong
India	Ireland	Italy	Japan
Malaysia	Netherlands	New Zealand	Russia
South Korea	Singapore	Sweden	United Kingdom
United States			

System Security and Integrity

On the Internet, effective security is the only way to control fraud and ensure privacy online. The risk of fraud in the traditional medium of transacting business is great. However, because computing has the ability to amplify the effect of a simple security intrusion into a large-scale phenomenon, the risk is of a far greater order of magnitude. A person who steals a credit card is only able to defraud a few people. On the other hand, thousands of credit card numbers and other relevant data may be compromised if a Web server is not secure.

Security is also necessary to prevent vandalism and sabotage on the Internet and also violations of data integrity. Security of information and communications systems involves the protection of the availability, confidentiality and integrity of computer systems and the data that is transmitted and stored therein. Security of an electronic commerce system must be ensured on four fronts - client security, server security, data transport security and operating system security.

[95] The Cayman Islands passed their Electronic Commerce Law and the Misuse of Computers Act in July 2000.

Internet security regarding the protection of the confidentiality of information in databases relies on encryption technology which until quite recently, was tightly controlled by the US and other OECD governments. In order to make encryption technology readily available and affordable to companies who develop Internet-based applications and systems in the Region, governments should lobby the developed country governments to reduce the controls on the export of such technology. There is also a regulatory aspect to the protection of security on networks.

Privacy

While issues such as privacy and consumer protection are not trade policy issues *per se*, they are critical to e-commerce because if they are not properly addressed, consumers will not embrace electronic transactions with enthusiasm. E-commerce will not develop rapidly unless consumers develop confidence and security about providing personal details (such as banking and credit information) on the Internet. At a minimum, consumers expect the same level of security that they enjoy under domestic laws for conventional transactions. The return of merchandise by dissatisfied customers is one issue.[96] From a policy perspective, governments need to create an enabling environment for e-commerce to take place; this includes consumer protection laws for the digital medium. The rest is up to the marketplace.

The 1998 OECD Ministerial Declaration on The Protection of Personal Privacy on Global Networks, released at the Ottawa conference on e-commerce, exhorted governments to ensure that the OECD Privacy Guidelines[97] are effectively implemented. The OECD guidelines are comprehensive and address most of the concerns raised in the context of e-commerce. If Caribbean governments adopt privacy guidelines similar to those adopted by OECD ministers, perhaps with some updated text to reflect the Internet medium, most consumers' fears will be addressed. [98]

The education of consumers regarding privacy issues and the development of contracts for online data flows are particularly important to e-commerce. In principle, the protection of privacy of personal data on networks is no different from protection of privacy in general, except for the technical difficulties in implementation due to the nature of the Internet. In order to ensure that privacy is protected in e-commerce, it may be necessary to make changes to domestic law to deal with the technological elements of this issue. At the same time, the technology itself is a basis for the solution as new ways are found to filter and block access to information, protect personal information in online databases, and facilitate authentication of information from buyers as well as sellers on the Internet.

The best approach is for the industry to find solutions to this problem. Indications are clear that various groups are addressing this issue through technological means.[99] Perhaps all that

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96 Under the European Commission's Distance Selling Directive (Directive 97/7/EC), shoppers buying goods or services online will be given an automatic right to cancel an order and claim a refund of any money paid, even after goods are dispatched. The directive applies to all contracts not conducted face-to-face. As such, this includes orders made by phone, fax or mail - not just those made over the Internet. However, there are exceptions, including business-to-business contracts, time-sensitive items such as airline tickets, and goods for everyday use such as food or drink. Financial service contracts, for example insurance, are also outside the scope of the directive.

97 Guidelines on the Protection of Privacy and Transborder Flows of Personal Data (Privacy Guidelines) were adopted on 23 September 1980 as a Recommendation of the OECD Council.

98 Countries such as Canada, the US and the European Union have developed privacy legislation or regulations.

99 In the same way that filters such as Net Nanny and Cyber Sitter have been developed to screen children from undesirable Internet content, a range of companies are working on software and architecture to improve privacy through fire walls. For example, the Open Profiling Standard (OPS) was developed by a group of software companies to specify what information they want to reveal to any particular Web site and have stored on their

governments need to do is to ensure that national regulations and legislation cover privacy protection on the Internet and all telecommunication networks, including through satellite or broadcast media. In effect, most reputable Web sites now contain information on their policy on privacy and indicate whether or not they are secure. In the long run, it may not be necessary for governments to legislate privacy standards. As consumers express consternation at the sale of information on their "surfing" habits or their addresses, purchasing patterns, etc., database companies have responded by curtailing practices that are considered inappropriate.

Although privacy is not of major concern to Caribbean consumers or users of the Internet if Caribbean firms sell online across the globe their customers may demand assurance that their personal data is kept confidential.

Fraudulent Practices

The right to redress in the event of dishonest or fraudulent claims by either buyers or sellers must be ensured in electronic transactions. Since e-commerce is conducted in an impersonal medium there is significant room for impersonation and all parties to a transaction would like to mitigate the risk and liability that may occur in e-commerce. Vendors and consumers also need to know that they are protected from the hazards of computer hackers and other dishonest people who may tamper with computer systems on the Internet. This can perhaps be addressed with some amendments to existing laws to facilitate the technicalities of a non-physical medium such as the Internet or any other network-based market. Nevertheless, since the regulations governing some industries were written with physical locations in mind, there are new challenges to be overcome. For instance, in securities trading or stock exchanges on the Internet, regulators may need to consider new interpretations, if not new rules.

By and large, the various industries that use the Internet will have to develop the necessary technical and administrative infrastructure themselves to guarantee consumers the same confidence in electronic commerce that they have in traditional transactions. In the meantime, the consumer is faced with the old dictum that the "buyer must beware." The level of risk on both ends of electronic transactions will rapidly decline as the market finds mechanisms to address concerns such as fraudulent practices or impersonation, by perfecting techniques dealing with digital signatures, among others. Similar to concerns about privacy, other areas of consumer protection relating to e-commerce are also being addressed through technological solutions or new services such as authentication.

Intellectual Property Protection

While most of the regulatory issues related to electronic commerce may be couched in terms of concerns about consumer protection, an equally important issue is piracy and the protection of intellectual property rights. Several international bodies and industry groups, particularly software manufacturers, have pointed out that this is a major impediment to electronic product distribution via the Internet. Intellectual property rights (IPR) are critical to providing security and trust with respect to investment and trade in ideas and new technologies by guaranteeing commercial returns. Caribbean societies pay scant courtesy to intellectual property issues and in some countries infringement of copyright has resulted in various cottage industries such as T-shirt printing and audio and video cassette sale and rental. However, the protection of IPR is very important to key Caribbean industries such as music and recreation services. And this has become more intense because of the ease of copyright and trademark infringement on the

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hard drive so that, for example, only an e-mail address is provided, but no other personal information. OPS is a reaction to the "cookies" that many Web sites now plant in users' computers without their knowledge. Similarly, an industry consortium called TRUSTe was formed to provide a certificate of approval to Web sites that maintain confidentiality of data. See Litan and Niskanen, *Going Digital!* 61.

Internet. Furthermore, Jamaica is the regional chair of the WIPO Committee that deals with intellectual property issues and the Internet.

The current WTO rules on Trade-Related Intellectual Property Rights (TRIPs) already provide adequate protection for intellectual property; the problem is that the technological means of digital delivery and copying make enforcement very difficult. What may be needed at the national level is the modification of domestic copyright laws to reflect electronic transmission and storage of digital software, music, books, and similar products or services. At the same time, new technologies such as digital watermarking and encryption can help protect against or prosecute rights violations. Various software developers and industry groups that have significant commercial stakes in the Internet are trying to find technical rather than legal solutions to this problem. Nevertheless, there are international initiatives that, together, can adequately address many of the piracy problems involved in e-commerce.

In addition to all the earlier copyright and trademarks and other agreements that the TRIPs agreement requires that WTO members uphold, the World Intellectual Property Organization (WIPO) adopted the Copyright Treaty and the Performances and Phonograms Treaty in December 1996.[100] All Caribbean governments should promptly ratify and implement these treaties and pay special attention to the challenges and opportunities of the digital environment. At the same time, governments should work together in WIPO to ensure that differences in national trademark laws and policies do not impede the ability of the owners of trademarks to take advantage of, and to protect, their trademarks on the Internet or in any electronic marketplace. Intellectual property rights are particularly important to Caribbean writers, musicians and performers who hope to expand their markets through e-commerce.

Furthermore, an international coalition of business organizations has made some useful suggestions for government action. They pointed out that governments should review how copyright infringement liability rules apply to all stakeholders in a digital, networked medium.[101] They identified the need for the establishment of a balanced and realistic framework of accountability that:

- ?? respects international norms;
- ?? provides incentives for increased inter-industry cooperation to deter and address infringements;
- ?? promotes responsible business practices;
- ?? does not impose economically unreasonable or technically infeasible/impractical burdens on intermediaries that neither generate, select nor control content; and
- ?? preserves an appropriate role for courts.

An intellectual property issue peculiar to electronic commerce on the Internet is the use by competitors, or even companies in totally different business activities, of famous trademarks or parts of them, for misleading purposes by capitalizing on the recognition factor of such names.[102] This is done by embedding popular names in meta-tags (or elements of headers) in Internet addresses or URLs so that when a consumer types a familiar name, the search engine takes the user to something else. This is a frustrating matter for potential electronic shoppers and a commercial issue for the holders of popular brand names and trademarks. It serves to dilute the

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[100] The Copyright Treaty specifically protects, by copyright, computer programmes, regardless of their form, and compilations of data or other material in any form, that by reason of the organization or selection of their contents, constitute intellectual creations. The Performances Treaty protects the rights of performers other than their rights in the audio-visual fixation of their performances and the provisions on the right of distribution.

[101] See *A Global Action Plan for Electronic Commerce prepared by Business with Recommendations for Governments* presented at the OECD Ministerial Conference "A Borderless World," Ottawa, October 7-9, 1998, 17.

[102] A notable non-commercial example is the fact that "*whitehouse.com*" is a pornographic Web site.

rights of the trademark or brand name holder and may be a breach of intellectual property rights.[103] It is practically impossible for governments to address this issue and commercial users of the Internet are best placed to tackle the problem. One mechanism is a code of conduct of self-regulatory principles and efforts at this are already underway. However, due to the highly diverse nature of the Internet, it is impossible to guarantee responsible behaviour by all parties. Nevertheless, as companies increasingly use the Internet for business transactions, it is highly likely that Internet stakeholders will find technological solutions to this problem.

Disputes regarding the alleged use of trade names in the domain names of online entities are now being arbitrated by the Internet Corporation for Assigned Names and Numbers (ICANN) under policies approved in September 1999.[104] There were 600 disputes in the first three months since the process started. In spite of some controversial decisions, the process seems to be sorting out the intellectual property issues relating to domain names.

Tax and Related Issues

International business has suggested that tax neutrality should be the guiding principle in government policy towards electronic commerce. Since 1998, WTO Ministers have agreed not impose customs duties on electronic transactions. In principle, if electronic sales are not taxed it could give this type of transaction a considerable advantage over taxed forms of commerce, raising issues of equity and fairness. Traditional domestic commerce within national markets and cross-border electronic trade involving physical goods that pass through customs will continue to face customs duties and value-added taxes but products delivered electronically will not. In general, the geographic fluidity of electronic commerce creates jurisdictional and other issues that are difficult to address.

A similar pattern may emerge internationally if electronic commerce is taxed in some countries but not in others. The same applies to corporate taxation. Firms operating on the Internet could relocate to tax havens and shield themselves from income tax. As electronic commerce increases in volume and popularity, there will be major implications for the ability of governments to raise revenues through traditional mechanisms like sales and corporate taxes, value-added taxes, and tariffs. It is highly likely that as governments obtain less revenue as tariffs decrease as a result of trade liberalization, they will be tempted to shift to sales taxes and various consumption taxes to make up for losses at the border.

There are essentially two types of taxation in the business world: (i) sales tax or value-added tax; and (ii) corporation tax. The former is paid by the buyer; the latter by the seller. The sales tax has no tax deduction offset possibility if the buyer is a person rather than a corporate entity. But corporation tax does have the deduction offset ability. This intersection of tax categories can be monitored and thus regulated in the traditional cross-border business models. However, e-business creates a complex set of issues which could result in conflicts among competing tax jurisdictions. Clearly, tax-neutral domiciles or corporate tax havens have a massive advantage in e-commerce. Indeed, an element of the OECD concerns about "harmful taxation" is driven by the fear that as e-commerce expands rapidly, the location of the taxpayer can just as easily be offshore as onshore. Hence, a country's tax base could dissipate quickly and perhaps permanently.

Taxation of electronic commerce involves complex issues that may not seem to have trade policy implications at first glance. But if taxation in different countries leads to inconsistency and unpredictability, it could frustrate and constrain commerce in the digital medium. As cross-

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[103] See WIPO, "Final Report of the WIPO Internet Domain Name Process," April 30, 1999.

[104] See Uniform Domain Name Dispute Resolution Policy. (www.icann.org/udrp/udrp-policy-29sept99.htm)

border e-commerce escalates, there may be a need for an internationally agreed tax code but the complexities and diversity of tax regimes are likely to prevent or inhibit negotiations. Caribbean governments should work internationally to address taxation issues as electronic trade increases but in the interim, the best policy is to continue the moratorium on customs duties and monitor the development of this medium of commerce until new mechanisms can be developed. Even if governments want to charge customs duties on electronically delivered products such as computer software or music recordings, the Harmonized System classification for goods is inadequate for the purpose of classifying tradable non-physical data over the Internet. At this stage, since the technology is not available to police the Internet for insignificant customs revenues, it seems prudent to let electronic commerce flourish and develop in order to take advantage of the direct and indirect economic benefits of the new trade horizon.

In the US and the European Union, there are now initiatives to collect consumption taxes on products sold through e-commerce. For the EU this is a significant issue because European goods and services taxes are high. Since the US does not have a federal sales tax, it is the US states that are concerned about loss of tax revenues to other states if taxes on e-commerce transactions are collected at point of sale. Some Caribbean officials have expressed concern about the possible loss of tax revenues as a result of e-commerce because products and services that are delivered electronically are not charged valued added or consumption taxes. In theory, this could be a major problem but in reality it may not be worth the administrative cost of trying to collect taxes on digital products (considering the fact that there are very limited means of monitoring online purchases).

Most studies of the tax implications of e-commerce in OECD countries suggest that the loss of revenue will be of little consequence. After, all, the range of products that can be delivered electronically is limited to music, computer software, books and videos and financial services. However, a recent study in Barbados concluded that online commerce could lead to significant loss of tax revenue.[105] It is necessary for Caribbean governments to study the possible impact of e-commerce on their tax base.

The Human Resource Infrastructure

Trained Personnel

Perhaps this is the most critical part of the e-commerce equation since all services are heavily dependent on people. Traditionally, the Caribbean has not been responsive to changes in technology and most training programs in the public system ? high schools, colleges and universities? are outdated and often bear little relationship to the skills demands of the market. In particular, it may be argued that there is too much focus on university training in terms of budget allocations and scant interest in technical and community colleges. Although each government makes hortatory statements about training for the information age, efforts to date to give real meaning to public statements are sadly lacking. There is very little public investment in training and some recent initiatives such as the Caribbean Institute of Technology in Montego Bay, Jamaica while noteworthy, are inadequate.[106]

Caribbean workers need training in areas such as Web design and development, TCP/IP, database management, multimedia applications, and in specific software applications such as

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[105] Jane Inniss-Brome, "E-commerce creating tax difficulties," *Barbados Advocate,* Business Monday, July 24, 2000.

[106] Note that Algonquin College in Ottawa, Canada, offers a multitude of short introductory courses and longer technical training courses on various aspects of the Internet, Web design, and e-commerce in its continuing education program. (See http://www.algonquincollege.com/ce/fall/index.html). This is apart from the full-time training courses in information technology. Most community colleges in North America do likewise.

Javascript, Frontpage, among others. These are basic tools for the development of e-commerce and e-business. Since the high cost of specialized technical training courses makes them not feasible at the national level because demand is very limited, a regional training centre should be the obvious approach but regional initiatives are by their nature slow and careful. It is unlikely that any regional institution will be responsive to changes in market trends. In the meantime, scholarships for training in North American institutions may be the best option because the technology changes so quickly. The current system for application and granting of scholarships is highly skewed towards academic undergraduate and graduate university level training. This issue must be addressed and rectified to deal with the realities of the demands of the information technology sector and e-commerce in particular. While public investment in training in computer programming and other longer-term aspects of information technology is feasible at the college and university level, it may be advisable to provide scholarships for courses overseas in e-commerce-related applications.

In some countries (Trinidad and Tobago, Jamaica, Barbados) private training institutes are beginning to offer various computer training courses through affiliations with foreign institutions. For instance, it is now possible to be trained in Web design, HTML, etc., in Trinidad and Jamaica if one looks hard enough. But the high-end training in sophisticated aspects of networking, systems management and database design and development and related areas is too expensive and the market demand is too limited at this time for training to be profitable in individual countries. It would be advisable to provide scholarships for such training in overseas institutions. At the same time, governments should consider subsidizing the cost of IT and Internet-related training offered by the private institutes because the fees are relatively expensive and prohibitive for most young people. Furthermore, the public education system in most Caribbean countries may never be able to provide such training in a cost-effective or timely manner.

Other Internet-Related Policy Issues

Domain Names

One of the main areas of concern regarding competition and electronic commerce is the system for the allocation of top-level domain names (DNS) – suffixes that are part of every e-mail or Web site address. Domain names are organized as a hierarchy beginning with top-level names that are then divided into second-level domains and so on. There are more than 200 national or country codes that are administered by corresponding governments or national agencies allowed by them. For instance, the country code top level domain (ccTLD) typically associated with Barbados is ".bb". As e-commerce grows the allocation of domain names in each country can become a commercial issue. All Caribbean countries should ensure that their domain name registry is nationally owned and managed in a transparent manner. At the moment, the domain name registries for St Kitts and Nevis, St Lucia and Dominica are managed by the University of Puerto Rico.

The Internet Corporation for Assigned Names and Numbers (ICANN) was created in November 1998 in response to the call by the U.S. Government for a "new not-for-profit corporation formed by private sector Internet stakeholders to administer policy for the Internet name and address system." ICANN's role is "to coordinate the technical management of the Internet's domain name system, the allocation of IP address space, the assignment of protocol parameters, and the management of the root server system."[107] Representation on ICANN has reflected the dominance of the Internet by the US. Caribbean governments and economic stakeholders should

[107] See www.icann.org

monitor the ICANN process to ensure that the interests of small states and developing countries are not ignored.

Up to September 1998, the most common, generic, top-level top level domains (.com, .org, .net, and .edu)[108] that are not national identifiers but denote the intended function of that portion of domain space (e.g., *caribbean.com, pizzaboys.com, microsoft.com*) have been administered by Networks Solutions Inc. (NSI) under an agreement with the National Science Foundation. There are now several domain name registrars that have been licensed by ICANN and this has made registration easier.[109]

At the international level, there is now talk about establishing new TLDs.[110] This can be important for developing countries and Caribbean economies in particular. One potential problem for Caribbean companies in e-commerce is the crowding out of the economic space on the Internet in terms of *dot coms*. Most of the generic commercial domain names are already being used or are registered and held by foreigners. This will make it difficult for SMEs in the Caribbean to have a significant Internet presence, except within the confines of their company name. However, this may not be a serious handicap because most of the CARICOM companies that would sell products and services online, tend to cater to niche markets. A related issue is the registration of Web addresses (URLs) with Caribbean significance or relevance. In order to secure a presence for CARICOM countries on the Internet, it is critical for firms to go online as soon as possible or, register domain names with Caribbean significance and hold them.

All the above issues have implications for e-commerce. In order for e-business to fully develop into an active global force, the technical aspects of the Internet must be internationalized. This is especially true for domain names as the popular names or the ones that are easy to remember will enjoy greater consumer use and value. For instance, names such as ".sell" or ".store" or ".buy," among others, could become very important in the long run.

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[108] In current practice, ".com" denotes commercial users, ".org" is not-for-profit organizations, ".edu" refers to educational institutions, and ".net" is used by network providers.

[109] In August 2000 there were 61 accredited and operational domain name registrars and many more that were ICANN-approved but were yet to begin operating as registrars.

[110] ICANN received applications from 47 entities for new generic TLDs. For details on the proposals ranging from ".ads" to ".zone," see: http://www.icann.org/tlds/tld-applications-lodged-02oct00.htm.

III.2 E-Commerce Activities of Greatest Potential Benefit to the Caribbean

Sectors That May Benefit Most From E-Commerce[111]

Tourism

Since so much of economic activity in the Caribbean consists of services, perhaps most businesses can become e-businesses. In the services sector, e-commerce can lead to substantial gains in the entire tourism industry? from booking flights, hotels rooms, tours, excursions, cars, ordering special meals, purchasing concert tickets, registering in Carnival bands, etc. online.[112] In fact, most travellers in the OECD countries have become so accustomed to using the Internet for information and reservations that it might be argued that Caribbean destinations and tourism operators that are not online and easily accessible might lose out to other locations. An interactive Web page allows all economic agents active in tourism access to totally new potential clients from non-traditional markets. This can be critical in extending the clientele beyond North America and Europe. The practice by a rapidly increasing number of vacations seekers of looking for the best deals on the Internet dictates that all operators in the Region take their business online. This is critical for hotels and all the ancillary services that accompany them. A further consideration is that a Web presence can lead to repeat customers as people become familiar with a particular establishment and can easily check on availability, new developments and activities on the Internet. Brand name marketing is a major phenomenon in the tourism industry and a Web page can provide critical information, sell "ambiance", service or special attributes and make customers familiar with hotel staff and facilities; these can be essential ingredients to make branding effective.

A recent Caribbean Tourism Organization study[113] pointed out the following opportunities for the Region:

- Internet in tourism will grow, converge and extend with mobile telephones and video.
- Internet operating costs are likely to reduce and Internet telephony will cut long distance voice call costs, allowing savings in budgets. VoIP will allow low cost voice contact between customers and tourism staff in the Region.
- Within a few years, face to face video contact will also become economic as technological developments improve.
- The Internet will allow marketing budgets to reach worldwide, 24 hours a day, 365 days per year.
- There could be significant replacement of printed brochures by online "virtual" brochures that are interactive and customized to suit individual client needs.
- Online bookings can reduce the duplication of data entry and checking.
- The Region can focus on the promotion of a "Caribbean" brand image.
- Revenue could be generated from a number of Internet sources and advertising revenue from a Caribbean tourism portal could be significant.

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111 It should be pointed out that in a limited policy study such as this report, it is not possible to do rigorous analysis of the actual potential for e-commerce to increase economic opportunities or exports. It may be worthwhile in future work to examine major export sectors in CARICOM in detail to assess whether/how e-commerce-based technologies can be harnessed to improve production and marketing.

112 Note that while BWIA (www.bwee.com) has online reservation and ticket purchasing systems, Air Jamaica (www.airjamaica.com) does not. Instead, its Web site merely serves as an advertising medium and customers must call a toll free number for service. This is a serious limitation in the highly competitive business of airline travel today.

113 CTO, op cit.

The CTO has proposed a Caribbean tourism gateway that will provide services similar to portals in the US but with a focus on tourism operators and clients. This initiative needs support and could pay significant dividends.

The Music Industry

E-commerce is of direct potential benefit to musicians and artistes in developing countries for various reasons. First, music can be downloaded by using relatively narrow bandwidth compared to video.[114] Second, it is easily digitized and digital music can be stored, transmitted and consumed without deteriorating in any way. Third, the Internet exponentially increases the potential market for music of all kinds. Fourth, e-commerce can circumvent the traditional, tangible and intangible obstacles of distribution in North America and Europe where high retail costs and cartelized distribution channels make it practically impossible for non-mainstream artists to sell their products. To a large extent, e-commerce is rapidly democratizing the music industry. The popularity of sites such as MP3 and the rapid evolution of technologies for the downloading of music online have clear positive opportunities for Caribbean performers, musicians and recording companies.[115] In spite of the recent issues regarding infringement of copyright on the Internet, the ability to deliver Caribbean music legally to audiences around the globe in a timely and efficient manner through new technology is a tremendous opportunity for the Caribbean music industry to market on a global scale. Music industry analysts predict that within 10 years about 25 percent of total music sales will be online. Most young people purchase music online now and this trend will continue. There are tremendous opportunities for Caribbean performers and recording companies in e-commerce but they must rapidly position themselves to take advantage of this new market environment.

An UNCTAD study on the music industry in developing countries concluded that there was great potential for music companies in LDCs but they will have to gear up for digital transmission and distribution of music as soon as possible. The same comment applies to the Caribbean and novel marketing initiatives have to be developed to take advantage of this opportunity. A clearly identified market for Caribbean music is the immigrant population in metropolitan centres in Europe and North America. Electronic delivery of calypsos and reggae music[116] would make it feasible to provide music to West Indians overseas at minimal costs compared to the premiums that consumers have to pay for CDs of Caribbean artistes (because of their low volume) in mainstream distribution stores such HMV, CD Warehouse, etc. Reggae music enjoys the "crossover status" between ethnic and mainstream markets and it is well known all over the world but it is not necessarily easily accessible in every country. Calypso music is well known to tourists but only enjoys a seasonal and geographic status. Every tourist who visits the Region is a potential purchaser of Caribbean music, however defined, and possible repeat consumer of such music if online relationships between tourists and vendors of music can be developed. A Caribbean or Jamaican or national music portals can extend the reach and accessibility of all musicians in the Region.[117]

Other service sectors in which the Caribbean can potentially develop e-commerce are a range of back-office services ranging from data entry, processing of insurance and medical claims, to

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[114] However, video images are important for promoting artists online by showing music videos and celebrity events, etc. Many international music stars now focus their promotional efforts on the Internet.

[115] Although MP3 was recently found guilty of copyright infringement, the entire global music industry - recording artistes, producers and distributors - are very cognizant of the potential for efficient delivery of music products to customers all over the world at record speeds.

[116] And all other genres of music from the region (soca, chutney, zouk, etc.)

[117] Note that CaribbeanMusic.com, a company based in Maryland, promotes and markets Caribbean music, artists and merchandise from various Caribbean islands online. Their web site advertises that they will sell the music of artists online and there is a license agreement online that musicians can sign and enter into a contractual arrangement with the company.

electronic publishing, customer call centres and telemarketing, hotel reservations, remote secretarial services, mailing list management, programming, technical support lines, among others. More sophisticated areas of outsourcing to IT firms in the US (like Bangalore) is a theoretical possibility at this stage. Initiatives in Jamaica and Barbados to promote the IT sector is a step in the right direction. But the appropriate infrastructure must first be put into place and adequate training of workforce is necessary to facilitate this. With the right policy measures, CARICOM countries are well placed, thanks to location and English language skills, to service many major companies in the United States that are looking offshore to reduce the cost of some of their operations. Furthermore, there is a familiar business culture and a tradition of investment and partnerships with North American firms in other industry and service sectors.

Other retail segments

In the retail market, the greatest value-added opportunities lie in using e-commerce to support well-known brand names or specialty goods (i.e. location specific or with special attributes as a result of culture or tradition). E-commerce pays the highest dividends in markets in which the costs of entry are high. Thus it will not pay off in the areas in which the cost of entry is low, such as the sale of general consumer goods (books, CDs, clothing etc.) if the local productivity and economies of scale do not create competitive advantage. It is unlikely that Caribbean firms will be able to compete successfully within the global or local and regional markets selling mainstream. There will be regional or very local applications ? e.g. on-line supermarkets or locally written school books ? for only the regional market but this will not lead to major new economic activity.

The opportunities for the Region exist in the areas in which there are recognized brand names or well known clusters of industries. These are in tourism and related services, entertainment industries, and the energy sector. A major potential area of e-commerce lies in the Government to Business and Government to Consumer applications but this will require new thinking in terms of how government conducts it everyday activities. Further, the Region has suffered economically because of its fragmentation. In the final analysis, although many individuals and SMEs will have Web pages as a means of advertising and communicating, and with some attempt to sell diverse products or services online, the main thrust will have to be in support of the things in which a competitive advantage already exists. But there is a need to open other channels, and to improve the regional transaction management of businesses through networking. Where size is of no importance— the markets for electronic goods are local or regional because of taste or applicability— then e-commerce may flourish.

Others areas in which e-commerce holds promise are traditional crafts and unique goods with Caribbean mystique. The possibilities are theoretically limitless and depend on the level of creativity and marketing talents of entrepreneurs in the Region. Nevertheless, it is clear that marketing on the Internet is a specialized skill that most Caribbean businesses may not have.

At the level of CARICOM the feeble attempts at a Single Market for goods and particularly services, must be strengthened and expedited. There is currently too much fragmentation of the regional market which leads to inefficiency and maintains the handicap of small size. E-commerce will allow producers and suppliers in the Region the ability to implement efficient transaction management schemes that can reduce the effect of spatial separation.

Of growing importance is the implementation of e-commerce like activities to replace bricks and mortar approaches, not because they save money, but because of customer convenience. This gives a competitive edge based on customer service and it is the new way to do business in a liberal environment. But it is unlikely that this will lead to significant new economic activity in the Region.

New Opportunities for CARICOM Firms and Individuals

The Internet provides the opportunity to significantly lower transaction costs and to facilitate new types of commercial transactions. More importantly, it is an excellent advertising medium. Small businesses and individuals can deal directly with faraway buyers through the Web, eliminating transaction costs and other barriers that usually make it difficult for smaller businesses to engage in long-distance and international trade. The comments of Kama Maharaj, the CEO of Sacha Cosmetics, an indigenous company from Trinidad and Tobago is illustrative:

> … It has always been our vision to build a global brand. Presently, we distribute Sacha throughout the region via traditional channels. Expanding outside the region however, has been an exercise in frustration. The Latin countries, for instance, all have restrictive non-tariff barriers. In the USA it is extremely difficult for a local brand to get product placement in the major department stores. The Internet now provides us with the opportunity to market our products in these countries, unencumbered, without having to undertake the level of expenditure traditionally associated with international marketing.[118]

For small and medium enterprises in the Caribbean and for even individual entrepreneurs, an Internet presence can lead to tremendous market opportunities. The two case studies in Box 1 and 2 illustrate the diverse possibilities for producers in the Region. The first is a traditional craft product that was rescued from extinction and it was never before seen as a means of economic sustenance for a local Amerindian tribe in a remote part of Guyana. The second is an established company with a special product that can reach a much larger market with the help of sophisticated online marketing, branding and endorsement from a celebrity. Both are now possible through e-commerce.

[118] Address to Rotary conference at the Hilton Hotel, Port of Spain, Trinidad, May… 2000.

Case Study 1

RUPUNUNI WEAVERS SOCIETY
http://www.gol.net.gy/rweavers/

Wapishiana hammocks are made by the Rupununi Weavers Society, a group of Amerindian women and men living in villages spread across some 5,000 square miles of remote grassland and rainforest in south-western Guyana bordering Brazil and Suriname. In 1991, with the assistance of Volunteer Service Overseas (VSO), the ancient craft of hand woven cotton hammocks was revitalized and became a new economic opportunity for the Amerindian people. Each hammock is woven individually in the homes of the women in the Society from cotton sewn, reaped and spun by hand involving some 150 spinners in numerous villages across the savannahs. The cotton is softer and stronger than any machine manufactured cotton. The hammock body is 2.4 meters long by 2 meters wide with scalines and intricate fringes on the sides and takes 500 to 700 hours to produce. The hammock sells for US$1,000 inclusive of shipping by registered mail. The Society has sold 20 hammocks since going on-line. They do not produce a large volume as the hammocks are hand loomed of hand spun cotton? a very time-consuming and labour-intensive process. All of the sales revenues go to the Rupununi Weavers Society and after expenses are paid, they fund training seminars and efforts to develop other products that the weavers can make to access a wider market for their skills. The Wapishiana hammock is a work of art and is exhibited in the British Museum and Smithsonian Institute.

The Web site was launched in early 1999 and it is hosted locally on the telephone company's server, Guyana On Line. Guyana Telephone and Telegraph (GT&T) sponsors the Internet connection. As it stands, no one within the society or the community at large in the Rupununi, has the knowledge to design or update a Web site. This is a drawback for the Society as the site needs upgrading and further development. For instance, they still need to borrow a digital camera for more images on the Web site. (It was expensive for the Society to have the Web site built in the first place). The Society needs to be able to advertise other products on the site as they are all unique, and post them as they are sold or brought into the outlet. They also want to pursue opportunities in the eco-tourism market, and must develop the tourism part of their Web site to cater to that. They realized that the price for the large hammock is out of the average person's range, and they have just started producing a less intricate Wapishiana hammock. It is smaller than the regular hammock and all white, or white with brown tassels. The fringe work on the side is less intricate, but the overall hammock is of the best quality hand weaving and made from 100% hand spun, local grown cotton. This hammock will be priced at US$200 plus shipping and are ready for immediate shipping.

Currently, they receive payment by direct money wire transfer to Rupununi Weavers Society's bank account in Georgetown, Guyana. Upon receipt of the funds, the hammock is shipped to the client by registered mail or courier. There are no facilities in Guyana to accept electronic payment.

Case Study 2

SACHA COSMETICS
http://www.sachacosmetics.com

Sacha Cosmetics is a twenty-year old cosmetics company, based in Trinidad that is well known in the West Indies for its quality products. Its yellow-based foundation that is ideal for West Indian skin tones has been significant in propelling the company into fame. This appeals to women of yellow skin undertones. It is interesting to note that in addition to people of colour, 80% of white Americans, according to Sacha Cosmetics, have yellow skin undertones, so the company set off to capture a share of that market. In 1999, Sacha Cosmetics gained international recognition as the official cosmetic of the Miss Universe Pageant and in 2000, the Miss USA Pageant. Using this endorsement, Sacha Cosmetics went online in April 2000, aggressively marketing its products' benefits to women with exotic skin tones. The focus has been on promoting the foundations and using that to introduce the rest of the company's products. There is no other company in the region marketing a similar line. They are striving to promote brand image and customer loyalty on that basis.

The Web site was developed in-house by Sacha staff. They have concentrated on having their site ranked on the first page of all the major search engines. They have now built an online store and are selling their products throughout the USA—80 % of current sales are in the US. But they have also received orders from diverse places as Hong Kong, Ireland and Switzerland. This is the first online store of its kind in the region outside of North America.

Sacha Cosmetics formed a partnership with an American company and products are shipped to overseas clients from a warehouse in Texas. The intention is to meet the demands of orders from all over the world. The company estimates that in the next two years, 50% of all Sacha Cosmetics' sales will be online.

According to Sacha Cosmetics executives, problems continue to plague the company's online initiatives. There is no infrastructure to support e-commerce in T&T. There is no support from anyone, even for advice on maintaining the Web site so Sacha Cosmetics is in a real sense pioneering in this field. The local server (TSTT) is seen as a major obstacle because the Sacha Cosmetics Web site is sometimes not accessible and is slow at times. The company has complained to TSTT about this but the reliability issues continue. Credit card processing was another area of frustration for the company, hence the need for Yahoo. Sacha Cosmetics had a merchant account set up through Yahoo for authentication and credit card processing facilities because the local banks would not offer such a service. The company is highly optimistic, despite the teething problems and lack of support from the T&T Government. E-commerce is the future of Sacha Cosmetics.

III. 3 Critical Factors Affecting Growth of E-Commerce

Experience from around the world suggests the following policies for promoting growth of Internet use:

?? Facilitate the widest dissemination of personal computers
?? Support Internet development at the highest level of government
?? Improve public network infrastructure through liberalization of the communications sector
?? Open and promote Internet access points to the public, i.e. guarantee universal access
?? Encourage favourable local tariffs for Internet services (i.e. special dialling numbers)
?? Create a competitive market for Internet service provision
?? Promote the adoption of cost-based tariffs in leased lines
?? Establish an effective and independent regulator

It is important to note that e-commerce grew in the United States without the Government doing anything to promote it and that the official approach is still non-intervention and a reliance on market forces. Both Canada and the US believe in a competitive Internet service environment, a flexible regulatory structure that does not impose the rules of the traditional telecom sector, and the principle of universal access to the Internet. There are plans to connect all schools and libraries to the Internet by the end of 2000. Canada also planned to establish 10,000 community Internet access sites in rural and remote areas by March 2000. In the United States, more than a million classrooms and libraries have broadband connection.[119]

A truism that is usually overlooked is that a network increases in importance, the more people that are on it. Therefore, universal access is critical to the development of e-commerce. This is the primary reason why all governments should try to get their citizens online as soon as possible. Some countries have started ambitions plans along these lines. The President of Costa Rica has pledged to provide free email service to all its citizens by 2001 and is working towards that goal.

Anecdotal examples abound of communities and individuals in developing countries using the Internet to reap economic benefits all over the world.[120] The potential opportunities for Caribbean business on the Internet are tremendous, if the right infrastructure is in place. However, at the very basic level there are many factors in the Region that work against the development of an information technology society. These are discussed below.

Limited Internet Access
Before we consider the specific issues that affect e-commerce, it is necessary to first examine the status of Internet access in the Region. **Table 1** shows Internet Indicators in Selected Countries. It reveals the low level of Internet access in CARICOM countries. Internet users as a percentage of population vary from 0.1% in Haiti to 5.5% in Antigua and Barbuda. Even Barbados (2.2%) and Jamaica (2.4%) that already have or are developing national information technology strategies, have very low Internet use compared to Bermuda (39.1%) and Canada (36.3%). In addition to low Internet access, the low level of telephone lines per household in the population is a related issue. Since the prevalent access to the Web is still a telephone connection, (unless

119 US Government Working Group on Electronic Commerce, "Towards Digital eQuality," 1999, p. 14.

120 The average income of families in a certain Peruvian village increased from US$300 per month in 1995 to US$1,500 per month in 1998 once they started selling agricultural products over the Web to a supermarket in New York with the help of the government, an NGO and an Internet service provider. (ITU, 2000). More recently, the success of PEOPLink in marketing handicrafts from indigenous artisans in Latin America over the Internet has attracted IDB funding for further expansion. PEOPLink has developed a network that serves about 100,000 artisans and small business owners in 20 countries. (*IDB America*, March-April 2000, p. 20).

wireless/satellite facilities suddenly become widespread), before countries address Internet access issues they must tackle the distribution of telephone service. The incumbent monopolies have been very lax in supplying telephone lines to the rural population in particular, in the Caribbean.

Cost of Computers and Information Technology

There are very significant constraints to the diffusion of computers and information technology in general that hamper e-commerce. Furthermore, there is no clear tradition of information management for decision making in the public or private sector. This has resulted in a culture in the Region that is not accustomed to, nor adequately appreciates the use of computers in home and business applications, or the Internet, compared to North America and Europe. The low level of computer use in homes in CARICOM countries is alarming and most SMEs do not bother to deploy computers in their businesses.[121]

The biggest direct factor inhibiting the widespread dissemination of computers in CARICOM countries is the cost of a personal computer. In most countries a computer (US$1,200-$1,500) is the second or third most expensive consumer durable in the average household and in some it can be the equivalent of 20 percent of the average annual salary. In the United States, a computer costs only about one-twelfth of the average annual salary. Furthermore, the price of personal computers in the US fell from an average of US$1,933 in January 1996 to below $1,000 in 1999.[122]

In the Caribbean, the cost of computer technology is further aggravated by government policies that do not recognize the irony of taxing products that increase efficiency and labour productivity. In fact, although most CARICOM governments claim that they would like their economy to participate in the global digital economy, several maintain policies that work against this goal. **Table 2** shows the taxes and charges on computer equipment and software across CARICOM countries. The information is based on the Trade Regulations Database of Caribbean Export which is derived from the CARICOM Common External Tariff (CET) and information from customs agencies in the Region. Although there may be some percentage of error due to recent government decisions that might not be reflected in the database, it is clear that government taxes add significant cost to the purchase of computers. For instance, although there are no customs duties on computers imported by individuals in several states, the duties on computer parts, and internal taxes and other charges on software negatively affect the sale of computers. They also work against the development of cottage computer assembly firms that could provide cheaper alternatives to brand name PCs, as is the case in the United States, Canada and Europe.

In the case of business computers which require expensive business software (such as database programs, accounting packages, etc.), the taxes may make the final purchase costs prohibitive.

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[121] Interviews with representatives of Neal and Massy East Caribbean Group, a relatively large company by CARICOM standards, and Uniserv, a networking company in Barbados, revealed that most small businesses are not convinced that computerisation is worth the cost. Furthermore, most businessmen are also skeptical of the utility of a presence on the Internet.

[122] As reported to the WTO Seminar on Electronic Commerce and Development, 19 February, 1999 by William Burrington, Vice President, Global Public Policy, America Online Inc., USA.

Unless full tax rebates are offered on software for business purposes, there is no incentive for small firms to utilize software or upgrade existing software. Furthermore, households will be even less enthusiastic to purchase software. This may contribute indirectly to the problem of software piracy and infringement of intellectual property in the Caribbean.

TABLE 1

INTERNET INDICATORS IN SELECTED COUNTRIES

	INTERNET					
	Startup date	ISPs 1999	Total Hosts Jan 2000	Hosts per "000" Pop.	Users "000" 1999	Users as % of Po
Antigua and Barbuda	1995	2	225	3.10	*4*	5.5
Bahamas	Sep. 95		4	0.01	*12*	4.1
Barbados			68	0.25	*6*	2.2
Belize	Aug. 1995	1	276	1.20	*10*	4.3
Bermuda			**2,825**	**44.14**	***25***	**39.1**
Dominica			181	2.39	*2*	2.6
Grenada	Oct. 96		3	0.03	*2*	1.9
Guyana	Oct. 96	5	16	0.02	*3*	0.4
Haiti	Nov. 96		1	0.00	*6*	0.1
Jamaica	Aug. 94	20	367	0.14	*60*	2.4
St Kitts and Nevis			8	0.19	*2*	4.9
St Lucia	1996	1	13	0.09	*5*	3.4
St Vincent	1995	1	0		*2*	1.8
Suriname	Oct. 95	2				0.0
Trinidad and Tobago	Sep. 95	6	4,852	3.78	*25*	1.9
Canada		800	1,669,664	55.10	11,000	36.3
United States		4,300	52,207,402	193.09	110,000	40.7

Note: Figures in italics are estimates or refer to years other than those specified.
Source: ITU, *Americas Telecommunication Indicators 2000*

TABLE 2
CARICOM's Duties & Taxes on Computers, Parts & Software
January 2000

Country	Customs Duty	Internal taxes	Common Taxes
Antigua	5% computers & parts 25% software	30% CT 30% CT	5% Customs Service Tax
Barbados	5% computer & parts 0 % software	15% VAT 15% VAT	1 % environmental levy
Belize	Free computer & parts 25 % software	8% Sales tax 8% Sales tax	
Dominica	5% computer & parts 5% software	Free CT 25% CT	1 % customs service charge
Grenada	*5%* computer & parts 20% software	25% GCT 25% GCT	5 % customs service charge
Guyana	5% computer & parts 20% software	Free 30% CT	CT
Jamaica	Free computer & parts 20% software	15% 15% GCT	GCT
St Kitts	Free computer 5% parts 25% software	15% CT 15% CT 15% CT	3 % customs service tax
St Lucia	0% computer & parts 20% software	0% CT 10 % CT	4 % customs service 1 % environ'tal levy
St Vincent	Free computer 5% parts 20% software	Free CT 30% 40% CT	2.5% customs service CT
Trinidad	Free computer & parts 20% software	0% 15% VAT	VAT
Suriname	5% computer & parts 20% software	7% VAT 7% VAT	0.5 % statistics tax 1.5 % consent tax

CT- Consumption Tax GCT- General Consumption Tax

Source: *Caribbean Export Development Trade Regulations Database*

It is clear that in order to stimulate the use of computer technologies and promote Internet access all CARICOM governments could reduce the customs duties and taxes, including value-added or sales taxes on computers, servers, routers and other equipment and software essential to Internet activities. As a first step, governments in the Region should join the Information Technology Agreement (ITA) negotiated under the WTO auspices. The ITA, which became effective in July 1997, aimed to eliminate tariffs by January 2000 on a wide range of information technology products including: computers; telecommunication equipment; semiconductors; semiconductor manufacturing equipment; software and scientific instruments. As of March 2000, 52 countries were participants, including Mauritius, Costa Rica and El Salvador. No Caribbean country was represented. Since there are no producers of IT equipment in the Region, and since it is counterproductive to tax efficiency-enhancing products and services, Caribbean governments should actively implement the ITA. It would be the first step in demonstrating that regional policymakers are serious about preparing CARICOM economies for information technology and the digital economy.

Cost of Telecommunications and Internet Access Services

A consistent complaint from consumers and businesses in the Region is the high cost of telephone calls and Internet access. It is a significant impediment to online strategies for most companies and the main reason why there are relatively so few firms in the Region with Web pages or a presence on the Internet. And in most households which do have Internet access, it is largely used for email to communicate with relatives and friends overseas. Extensive online searches are too expensive. There are two related concerns: the monthly subscription cost of Internet access and the per unit cost of telephone charges. Internet access is priced according to various packages in terms of the number of hours of online access per month – 10, 20, 40 hours, etc, and although unlimited access is available, it is expensive and subscribers often find it difficult to dial in because of busy signals due to over-subscription. Also, in most countries in the Region, unlike in North America, there are no flat rates for domestic calls.[123] Telephone charges are billed by the minute so it is not feasible to stay connected to one's Internet server for long periods since there are two costs to consider? the telephone bill as well as the Internet access fees.

TABLE 3

Monthly Cost of Residential Dialup Internet Access *
June 2000 - US$ per month

	Bahamas	Bermuda	Barbados	Guyana	Jamaica	Trinidad & Tobago	Cayman Islands
20 hours to unlimited access	$20 to $250	$44 to ?	$23 to $38	$38 to ?	$34 to $60	$13 to $130	$27 to ?

* Information obtained from local ISPs. Installation costs are extra.

The average cost of residential dialup Internet access in the US is $10 per month. **Table 3** shows the typical cost of Internet access in some Caribbean countries for basic dialup service through telephone lines that operate at 33kps or 56.6 kps. Remember the limitations of telephone dialup mentioned above? slow speed and long download times. To appreciate how expensive are these

[123] Barbados is the notable exception where local call charges are zero.

rates for basic service in the Caribbean, compare them to the cost of high speed access in Canada. Since July 2000, a cable company called LOOK has been offering unlimited high speed modem access to the Internet via satellite to residential consumers for an installation fee of C$75.00 (including satellite dish, and cable modem) and a monthly fee of only C$35.00![124] This rate is for access through a cable modem operating at 1.5 Mbs (download). Even the incumbent provider, Bell Sympatico offers unlimited Internet access at 1 Mbs for $30 per month (with free installation and modem for a limited period). All indications point to the fact that high speed access in Canada will level off at around $20-$25 per month and may fall further as new technologies become readily available and competition increases.

The problem in the Caribbean is much more severe for business users. A typical business that does online sales normally uses a T1 line. In the United States a T1 connection costs between US$800 and $1,500 per month depending on location and service package. AT&T Canada is now offering high speed ADSL service (at 2.2 megabits per second) to business customers for about US$275 per month. In comparison, **Table 4** shows the cost of a T1 line in some Caribbean countries. The difference is startling and clearly demonstrates why SMEs in the Caribbean will not bother to develop e-businesses? they will never be able to afford it at current prices. In Guyana, the situation is even worse; T1 lines are not available and a 64kps connection costs ISPs US$14,500 per month!

[124] If one subscribes to both cable TV ($25) and Internet access, the rate for the latter falls to $30. This is what an average restaurant meal costs in most Caribbean islands.

TABLE 4

TELECOMMUNICATIONS RATES IN SELECTED CARIBBEAN COUNTRIES

US$

Type of Service	**Barbados** [bc]	**minica**	**Grenada**	**Jamaica Rest of Jamaica**	**Jamaica Digiport**	**St. Kitts & Nevis** [d]
Leased circuits – T1 Half channel/month	16,647.00	18,100.00	18,100.00	21,980.00	18,100.00	18,100.00
RT-1 full Channel/month	n.a.	n.a.	n.a.	49,500.00	n.a.	n.a.
Installation charge	1,515.00	1,850.00	1,850.00	5,000.00	2,495.00	1,850.00
56kbps/month	2,080.00	1,995.00	1,995.00	*2,800.00	1,850.00	1,995.00
Installation charge	1,263.00	1,850.00	1,850.00	*1,500.00	1,995.00	1,850.00
X.25 @ 9.6 Kbps/kilopacket Charge				6.00-8.00		

Source: Report on Informatics in the Caribbean, World Bank

[a] Based on AT&T's Customnet Plan for large volume business users
[b] One hour minimum for international 800 services
[c] Special rates for informatics
[d] Residential charges between unlimited times
* ½ channel cost

Adapted from data compiled by the *Information Technology Unit*, Ministry of Industry, Commerce and Technology, Jam
Prepared September 1999 (updated March 2000)

The Slow Rate of Development of the Network

A related issue is the slow rate at which telecom companies in the Caribbean are constructing networks for the future. In fact, some critics argue that they are not building for the future but instead are waiting until the end of their monopoly. It is a chicken and egg dilemma. Incumbents sometimes argue that it is very expensive and risky to install new technology without the assurance that the market will bear the cost of upgrade. Indeed, in principle, the small size of Caribbean economies does not automatically provide a critical mass of players to support the required investment in comprehensive broadband networks. Individual users will not be willing to pay even the economic cost to establish the telecommunication networks upon which the success of e-commerce depends. But if these networks are built, in terms of the increase in efficiency of communications and transactions, the social and economic benefits will be large. On the other hand, without the network availability e-commerce will not develop. Perhaps there may be a role for governments in the financing of new telecom networks. It should be remembered that the US Government helped to establish the Internet through direct funding and once this was achieved it withdrew, leaving the development of the network to the market. It might be theoretically possible for Caribbean governments to fund part of the development of the infrastructure for the digital economy, but hardly politically feasible. As discussed below, competition might be the better alternative since new entrants generally introduce new technology.

Professor St Clair King, an IT consultant in Trinidad suggests that another approach is to "contract out the development of a wide band network to the private sector, creating a temporary monopoly, especially if the first customers are indeed the required government intranet, extranet and Internet access networks."[125]

In the meantime, there is inadequate bandwidth for the new types of applications that are emerging. Very few residences and only a small number of businesses are wired for high speed Internet access services. This is a serious constraint to successful e-commerce. In particular, North American consumers (the Caribbean's obvious market) react negatively to slow or basic Web pages. And if videos and graphics are necessary to sell products and services (e.g., photos of a hotel or beach property) online, bandwidth is clearly critical.

Most governments have recognized the critical importance of this sector to all other kinds of services and economic activity in general. It is commonly known that a clear solution to the whole issue of high telecommunications costs and lack of bandwidth in the Caribbean can be solved by the introduction of competition in this sector. According to their GATS schedules, competition is not expected to be introduced until well after 2000 in many Caribbean countries.[126] Many of the territories, such as Anguilla, Aruba and the Cayman Islands, have not yet set a date for the introduction of competition in their telecommunications markets. However, as mentioned above, Trinidad and Tobago, Jamaica, Barbados, and to a lesser extent, the OECS, are considering means to introduce competition for the provision of certain specific value-added services. In several jurisdictions there are confusing notions on whether the national monopoly has the rights to control satellite services as well. In Barbados, the general public is of the impression that the contract between the Government and Cable & Wireless is a "secret" contract and hence no one else can scrutinize it. Interestingly, in Grenada competition in Internet access services apparently has been (is being) introduced through wireless/satellite but there does not seem to be any clear policy on this matter.

Domestic Telecom Regulatory Issues

Apart from the direct cost of telecommunications services, there are also domestic regulatory issues concerning the operation of incumbent providers in the Region. For instance, it is not clear

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[125] Prof. St. Clair King, "E-Commerce: The Threats." Mimeo.

[126] The dates are as follows: Antigua and Barbuda (2012); Grenada (2006); Guyana (2010); Jamaica (2013); St. Kitts and Nevis (2015); Trinidad & Tobago (2010); and Barbados (2012).

that incumbents accept that they must allow interconnection to their grid. Governments must clarify that in each country. Secondly, the terms of access to Internet service providers (ISPs) is used to discriminate against competitors. An important related issue is cross-subsidization. ISPs in Jamaica argue that CWJ is using its monopoly position to subsidize its Internet access operations from its telephone operations.[127] A third issue is the complaint by some ISPs that certain telecom providers charge much higher fees for access to the backbone (T-1 lines) to resellers (ISPs) compared to direct clients. This is anti-competitive behaviour and governments should clearly proscribe it. There are also other ways in which the monopoly providers can frustrate ISPs such as not providing them with telephone lines to the Internet grid or allowing very lengthy delays in the supply of such lines. This seriously restricts the growth and expansion of the ISPs themselves and leads to frustrated customers because people are unable to get Internet access on time. (Guyana is a good example of this).

No Caribbean country listed Internet access services in its GATS schedule. It may be worthwhile for all governments to open that market segment to competition by including it in their GATS commitments. Although there may be concerns that large foreign ISPs may take over the market, that is not necessarily the case in reality. There are specific conditions (cultural and otherwise) that allow local ISPs to serve niche markets better than foreigners but indigenous ISPs are often limited by technological constraints due to lack of capital. In any event, if foreign firms invest in local ISP service in the Caribbean, they may create jobs and introduce newer technology as well as improve the skills level in this sector. The critical importance of Internet access to e-commerce and the general public interest concerns regarding access to resources on the World Wide Web are sufficiently compelling reasons to dictate that conservative or protectionist policies are not allowed to lead to the loss of economic opportunity.

Attitudes toward e-commerce

There is relatively low awareness by consumers and businesses in the CARICOM region of the potential of e-commerce. Since the countries are small, people are used to person-to-person interaction in business transactions and hence there is reluctance to embrace the more impersonal medium of Internet-based transactions. Furthermore, Caribbean consumers appear hesitant to embrace credit cards and are mistrustful of online credit transactions.[128] This is aggravated by the fact that Caribbean banks have a particularly skeptical or negative attitude towards credit card transactions.

Financial issues

The appreciation of international e-commerce stocks over the past two years remains a startling phenomenon, even after the stock market correction in the spring of 2000. But in spite of all the hype about the brave new market of e-commerce, it is sobering to consider the facts. In April 2000, the market capitalisation of Amazon.com Inc. was a mind boggling US$18.3 billion even though the company has a mere US$1.6 billion annual revenue and is yet to earn a profit, after five years in business. It is clear that in the capital scarce Caribbean, e-commerce startups will never be able to survive without making profits for several years. The venture capital market in the Region is almost non-existent and, as discussed below, banks are not willing to finance companies which they cannot value by conventional methods? physical assets such as land, buildings, stock; and price to earnings ratio of its shares. So the e-commerce strategy for small firms and individuals in the Region has to be lean and very carefully designed so that it is profitable in a short time.

The issues here can be summed up as the lack of capital for investment in e-business due to a negative attitude by banks and the unavailability or high cost of credit card transactions online.

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127 This practice was explicitly outlawed in Canada in a case involving Bell Canada.

128 This is not a unique problem. Europeans are less prepared than Americans to buy electronically and are less likely to have credit cards. In fact, in the UK and Japan, Amazon.com offers additional payment options such as cheques and postal orders because European and Japanese customers do not regularly use credit cards.

Business people in all CARICOM states report the same problems regarding the conservative nature of the banking system and the negative attitude by banks towards e-business. In most cases, because Internet firms are small, individually owned entities, banks are unwilling to finance loans to them.[129] This is a serious constraint to the development of real economic opportunities online and must be addressed rapidly. Otherwise, CARICOM citizens will lose out on business opportunities on the Internet. However, for the firms that already have an Internet presence, a further problem is the lack of credit card facilities or the high cost.

The problem is epitomized by the experience of Southex Trade Shows and Promotions, a ten-year old company in south Trinidad that will host a virtual on-line trade show in October 2000 with the theme "e-BUSINESS OR out OF BUSINESS." The company promotes music concerts and events. It also sells music CDs of Trinidadian performers by mail order. When asked whether there were plans to sell online they responded as follows:

> We are not currently accepting credit card transactions on the site because all the local commercial banks in Trinidad do not have a system in place to handle that type of business. They are afraid of credit card fraud. This has hampered us tremendously since for every inquiry that is made on the site with regards to a purchase, once the potential customer realises that we cannot accept a credit card, that's it. Our direct Internet sales have been nil because of this problem. We are addressing the problem, and we are currently going to register with a foreign bank to be able to accept credit cards.

At an OECS-sponsored meeting in St Lucia in July 2000, businessmen reported that the local banks demand security deposits of EC$ 250,00-500,000 for merchant accounts for online credit card purchases. In effect, it is impossible to set up merchant accounts for SMEs in the Region and they unable to take advantage of opportunities in e-commerce. There is apparently great apprehension by banks about credit card fraud. But there are means of addressing this concern and systems are in place in the US to deal with that problem. In the meantime, due to risk aversion, Caribbean banks are actually losing out to foreign application service providers (ASPs) like Yahoo and others. Although some consumers are hesitant to give credit card information online, with encoding using encrytion technology, the chances of someone accessing the credit card number is much less than in a physical place such as a store or restaurant. In a store, a credit card number can be copied when the card is given to someone for authentication during a transaction. In many cases in the Caribbean, the store employee goes out of sight to make a phone call or to swipe the card. The biggest threat in online sales is that of stolen cards in which dishonest people give someone else's credit card number to pay for goods that they order. This problem can be reduced by the sharing of information on addresses of customers by the banks and credit card companies.[130]

Structural Issues

Furthermore, the cluster of skills that accompany e-commerce is not developing rapidly in the Caribbean because of the problems faced by companies that find it difficult to do business

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[129] This is a problem all over the world but is particularly acute in the Region. Furthermore, in the Caribbean it is compounded by the fact that banks seem more eager to finance consumption loans to individuals (for cars, holidays, etc.) rather than business loans to individual entrepreneurs.

[130] According to Visa Canada, more than 50% of disputed transactions originate on the Internet, although only 1-2% of Visa transactions are processed online. In the US Mastercard and Visa offer online retailers a service called AVS (Address Verification Service) through which merchants can verify that the customer's shipping address matches the cardholder's billing address. This mitigates the possibility of online fraud. However, it is true that in many jurisdictions, the liability of consumers is much less than that of retailers. Some banks ask retailers to guarantee merchant accounts with special deposits or they delay payments for a specified time. They also charge merchants higher fees for online transactions. Furthermore, many banks reserve the right to rule that the liability rests with the vendor.

online. Many companies are forced to go overseas for Web hosting services, authentication, shipping/express delivery, among others. Generally, services are non-existent, inadequate, unreliable or generally too costly locally. This is a major problem – how to encourage rapid development of Web designers and developers, programmers, e-marketers with Web advertising skills, technical competence in Javascript, Frontpage, database design and management, Web authoring, among others. Policymakers and the private sector should be concerned that the more Caribbean Internet-based firms use foreign ASPs for specific services (e.g., authentication and hosting) necessary to doing business online, the less is the chance that any of the other related services will be procured in the Region. For instance, once a firm hosts its site on a foreign Internet host and uses a foreign ISP or bank to process transactions, it is highly likely that Web design, graphic art, advertising and most multimedia services necessary to conduct their business will also be sourced overseas unless those services are available locally at lower cost.

The major challenge is for the Region, as a whole, to put more emphasis on developing home-grown Internet technology infrastructure and other Internet services.

III. 4 Regional Co-operation Possibilities

The Internet and e-commerce are by their nature open, competitive areas of activity and firms that operate online must be flexible and competitive. It is therefore not wise for governments to try to intervene in this environment to assist firms in any significant way. Nevertheless, in light of the infrastructural problems and the issue of small size in the Region, there may be some mechanisms for regional approaches to facilitating e-commerce in terms of providing the appropriate environment.

The CARICOM services market

The first area that governments in the region should tackle is the rapid liberalization of trade in services in CARICOM. This is necessary for bricks and mortar service suppliers **and** e-businesses to expand and develop economies of scale that can then be applied on a wider basis, even globally. The longer it takes for national governments to truly liberalize sectors such as insurance, banking, telecommunication, professional services, computer consulting services and a range of other service activities, the less incentive is there for service companies in CARICOM to move to the Internet to conduct business. At the moment the small size of national markets makes networking or the use of information technology and e-commerce unattractive for the majority of businesses in the CARICOM region.

A related area in which governments can act regionally is online procurement of goods and services. It would be a tremendous boost to e-commerce in CARICOM if governments were to establish a regional online procurement group (OPG) or auction site similar to online buying initiatives among private companies in the global market. This would facilitate significant savings and at the same time make Caribbean businesses shift to online activities with more enthusiasm than exhibited up to now.

Staging facilities in major export markets

One of the major hindrances to small firms wishing to engage in B2C e-commerce for small ticket items (handicrafts, processed foods, collectibles, etc.) would be the high delivery cost. Whilst the SMEs in any single territory may not be able to support such a venture, a regional undertaking may be feasible. Note that most of the few firms that currently sell goods through e-commerce have to partner with a foreign firm for warehousing and shipping services. Most of these undertakings are currently in the US. There is significant room for governments and chambers of commerce in the Caribbean to collaborate and jointly develop facilities in the US and Europe for handling the delivery aspects of sales made by small Caribbean firms.

A Caribbean portal

In the same manner that there are tourism information gateways online such as Bahamas Online, Caribbean Online, etc., it would be worthwhile to establish a Caribbean Portal. This would create a single gateway or "face" for goods, services and information offered by the private and public sectors in the region. The attempt by Caribbean Export to set up a portal for SMEs that wish to sell their goods online, should be broadened and expanded to include all types of industries and sectors. Over time, it could become the premier online site for any individual or firm interested in purchasing Caribbean products or services. It can also serve as a means for promoting a Caribbean brand in the international market.

Regional e-business training facility

By their nature, regional institutions are slow and bureaucratic. Decision making at the University of the West Indies is a classic example. However, a regional e-business skills development and exchange facility in which consultants and technical experts with Internet and e-commerce-related skills can market their services across the region can be a useful mechanism to address the localized short-term labour shortages that are constraining e-business development at the moment. Many of the companies that are in the process of developing e-businesses or already have e-commerce sites point out that it is often difficult to get people with the requisite technical skills to develop and maintain Web sites. This is particularly true for any firm that wants to establish interactive online sites with sophisticated search engines and databases. CARICOM governments should work towards the establishment of such a facility. It does not have to be a physical creation but a virtual office and Web site with support from trade ministries, CARICOM Secretariat, Caribbean Export and national chambers of commerce and the Caribbean Association of Industry and Commerce (CAIC).

CyberCrime

In order to develop secure computer facilities and develop confidence in e-business and e-commerce in the Region it will be necessary for governments to have a common approach to dealing with computer crimes and online fraud. This is an area for possible useful cooperation among national crime-prevention agencies. It could also address issues such as computer viruses and the destructive activities of computer hackers.

The initiatives suggested above can work towards the promotion of the enabling environment for e-commerce at the regional level and stimulate interest in e-business by the private sector. In addition, it is important for CARICOM governments to collaborate regionally so that the policy initiatives at the national level in terms of legislation and regulations regarding digital signatures, privacy, intellectual property and other areas are compatible.

SECTION IV NEGOTIATION ISSUES REGARDING E-COMMERCE

IV. 1 Summary Evaluation of WTO Issues

Approaches to the treatment of e-commerce

Two basic attitudes to e-commerce characterize discussions at the WTO and elsewhere. The first takes a benign view, asserting that, at least for the time being, it is best to let markets and self-regulation determine how electronic commerce will evolve and keep government intervention to a minimum. This approach is favoured by the United States and the White House has played a major role in promoting the Internet and information technology in all aspects of government and in the wider economy.[131] The second approach is more pro-active, moving quickly to solve or even anticipate problem areas and providing government regulatory solutions. It is well-illustrated by the EU *Directive on Data Protection*, which significantly restricts the capacity of non-EU members to offer Internet-based products to EU consumers.[132] More generally, such an approach posits the need for governments to act collectively using the vehicle of trade negotiations to meet a wide range of non-economic societal objectives.

The US approach is not difficult to appreciate. It is consistent with a general US suspicion of government intervention and a confidence in markets and private sector solutions. It also reflects the extensive lead the United States enjoys in the provision of the infrastructural basis for electronic commerce as well as in its application. Caribbean governments are not yet in a position to have a definite approach to e-commerce and most likely will proceed very carefully. Several countries have formed multi-stakeholder task forces on e-commerce to advise Government and make recommendations on facilitating e-business or are drafting e-commerce legislation.

International business strongly supports market-based approaches to e-commerce and commitment to self-regulation. In a submission to OECD ministers in 1998, a coalition of international business organizations set out ten fundamental principles that should shape the policies governing global e-commerce.[133] These principles build on the assumption that "the development of electronic commerce should be led primarily by the private sector in response to market forces" (see Annex 2).

This report leans toward a liberal approach. It is written from the perspective that e-commerce in general, and the Internet in particular, offers exciting market opportunities for CARICOM producers and vendors. As well, it offers consumers greater choice, improved efficiency, and enhanced competition. Governments should only intervene in its evolution to support or facilitate it and address major problems but only when necessary. A liberal approach should both stimulate growth and development of the enabling infrastructure and facilitate the production and consumption of a wide array of products (goods and services) that can benefit either in whole or in part from electronic data transmission in its production, distribution, or consumption. There are at least four dimensions of e-commerce that can benefit from liberal market access conditions:

?? Infrastructure – the computers, software, and telecommunications networks needed to deliver e-commerce.

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131 United States, Executive Office of the President. *A Framework for Global Electronic Commerce. July 1, 1997 (www.iitf.nist.gov/eleccomm/ecomm.htm)*. The same ideas and attitude are repeated in the US submission to the work of the WTO. See WTO document S/C/7. Both the EU and Japan also presented papers to the WTO setting out their views: S/C/W/ 87 and 98 respectively.

132 See *www.ecommerce.gov/eudir.htm*.

133 *A Global Action Plan for Electronic Commerce prepared by Business with Recommendations for Governments*, presented at the OECD Ministerial Conference, "A Borderless World," Ottawa, 7-9 October 1998.

- ?? The economy generally – the impact of efficiency enhancing technology represented by the use of e-commerce, such as data transmission, browsing and searching, and delivery.
- ?? Complementary services – postal, courier, transportation, communication – which can be either affected or enhanced by use of e-commerce.
- ?? Electronically deliverable products – a small but growing segment including software, music, films, some books and reports, mail, advice, ideas, data, education, and medical diagnostics.

The clear choice for governments is to continue on a path of reducing and eliminating regulatory and other barriers to international commerce and strengthening the basis in rules and procedures for a liberal approach, including for e-commerce.

WTO Rules and E-Commerce

The most comprehensive intergovernmental work program on e-commerce to date was mandated by the World Trade Organization. Its Councils for Trade in Goods, for Trade in Services, and for Trade-Related Intellectual Property Rights have each considered the extent to which e-commerce is already covered by existing disciplines in order to determine whether there is a need to address any problems or gaps in the WTO's provisions.(See Annex 3 for a summary of its preliminary findings). Each of the Councils reported its findings to the General Council in preparation for the WTO's third ministerial meeting held in Seattle in December 1999.[134] Since the Ministerial failed, there are outstanding issues regarding e-commerce that may need to be tackled at the multilateral level.

GATT or GATS?

The current GATT rules reflect fifty years of careful negotiation and evolution; the GATS rules reflect a first approximation of what governments were prepared to accept in 1993 to govern their regulation of trade in services. The GATT rules are more complete and definitive. The GATS rules are still, to a large extent, under construction. For example, under the GATT, national treatment is a broad requirement that applies to all goods and is qualified by a number of narrow and specific exceptions. Under the GATS, national treatment is a negotiated commitment that may be qualified and limited for those specific services that are covered by the commitment. The GATT includes very specific and detailed disciplines related to customs duties, valuation, subsidies, safeguard measures, and trade remedies (antidumping and countervailing duties). The GATS is either silent on these matters or anticipates the possibility of future negotiations to establish disciplines. On the other hand, the GATS does include rules on domestic regulation and related matters that could involve significant disciplines affecting domestic laws and policies relevant to e-commerce.

The majority of economic activities that are handled fully on the Internet, such as the capacity to browse, search, order, and pay for selected goods and services, constitute a combination of information, knowledge, and ideas that can be digitized and used in a variety of formats. It is generally accepted that the electronic impulses involved in delivering these digitized products constitute the physical basis of a service transaction and that the transaction is what counts from a trade policy perspective. Based on this distinction, the only remaining ambiguity involves products that can be delivered either electronically or physically. Only certain types of goods can be fully digitized and thus there exists a limited universe of digital products that can be substituted for goods; most involve the electronic delivery of a service. For instance, software purchased and delivered electronically is only made possible through the telecommunications services covered by the GATS and may involve advertising, credit verification, payment, and distribution, all service transactions covered by the GATS.

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[134] See WTO, Council for Trade in Services—Revised draft— *Work Programme on Electronic Commerce- Progress Report to the Services Council,*S/C/W/115/Rev.1, 20 July 1999.

The issue of close substitutability raises the question of whether the trade rules applying to the electronic and physical forms should be the same. A related question is whether physical goods and electronic versions of the same are "like products" as defined under GATT Article III.[135] A further question is how do "like product" rules affect e-commerce services in the application of the most-favoured-nation (MFN) principle? All previous GATT and WTO jurisprudence assumed that goods have physical characteristics and these generally defined whether two goods were "like" products. Competition from foreign products was clear-cut because both the domestic and foreign product were physically similar. This is obviously not the case with closely substitutable physical and electronic products, such as audio CDs and digital audio downloads such as MP3s.

This question has some ramifications for tax and customs procedures, especially in light of the 1998 WTO Ministerial Declaration to apply a one-year moratorium (which has since continued) on the collection of customs duties on products purchased through e-commerce. The moratorium has created an element of discrimination to the extent that a product such as a book or magazine or computer program delivered electronically is not charged customs duties or taxes while charges may be levied on a directly substitutable or competing product delivered as a physical good. In the case of the latter, the extra charges make the product more expensive and may render it less appealing to consumers. If the two suppliers are in different countries, then there may be some concerns regarding contravention of the most-favoured-nation (MFN) principle.

Issues such as these are inevitable in light of the evolving nature of e-commerce and the relative novelty of the WTO rules on services. Policy prescriptions are unclear at the moment and since instances of such discrimination, while plausible, are not common, they should not be given significant attention. It is in the interest of global commerce to address these minor complications in the specific instances where they arise, rather than try to negotiate rules to cater to all the possible scenarios that may be created by rapidly evolving technologies.

The provisions of the GATT thus seem to be of limited relevance to e-commerce. Its most important role lies in continued efforts to negotiate reductions in market access barriers to trade in information technology products, i.e., to the goods that provide the critical physical infrastructure for e-commerce. Much was achieved as a result of the Information Technology Agreement (ITA) signed in March 1997, to which some 52 WTO Member governments now adhere, accounting for more than 90 percent of world trade in information technology products. Plans for a new round of negotiations to broaden the product coverage of the agreement and expand its membership are likely to form part of the next round of multilateral negotiations.

The GATS and E-Commerce

To a large extent, the global development of e-commerce will depend on the realization of a global information infrastructure which in turn will involve complex changes in technology, industrial structures, and business practices. A truly global information infrastructure will be driven by the continued convergence of industries in telephone, cable, wireless systems, computers, software, and the video, text, and image providers that supply value-added content. Liberalization efforts through multilateral and regional trade agreements should facilitate this process of convergence by building on the past fifty years of trade negotiations. A close examination of the GATS and its related annexes and schedules on telecommunications reveals that it already addresses many of the market opening, regulatory, and consumer protection concerns raised about e-commerce. Nevertheless, the architecture of the GATS does not make it easy to identify the extent to which its provisions already apply to e-commerce. It contains

[135] See GATT *Analytical Index*. In 1970, a GATT Working Party suggested a number of criteria to determine likeness on a case-by-case basis in the context of Article III: the product's end uses in a given market, the products properties, nature and quality, consumers' tastes and habits, among others. GATT, "Working Party on Border Tax Adjustments," BISD 18S/97, par. 18.

relatively few general obligations. Rather, most of its rules only become operational once a Member has made specific commitments as set out in a rather elaborate system of national schedules and sectoral annexes attached to the GATS.

Scope of the GATS

Article I.1 of the GATS states that the Agreement applies to measures affecting trade in services. In trying to conceptualize a way to categorize services into negotiable parts, negotiators came up with a way of dividing the universe of services into four "modes" of supply, allowing governments to make access and national treatment commitments for any specific service category on one, two, three, or all four modes. The four modes are defined on the basis of what level of cross-border activity is required to deliver a service on an international basis. It is important to keep in mind, however, that this categorization of services was devised to facilitate negotiations and the scheduling of commitments. While this categorization was not conceived as a way of classifying whether a specific e-commerce transaction falls under a particular mode of delivery, it is now an important part of the architecture of the GATS and has a significant bearing on determining its application.[136]

Article I:2 outlines the four modes of supply as (1) cross border supply, (2) consumption abroad, (3) commercial presence, and (4) presence of natural persons. Article I:3(b) indicates that "services" includes any service in any sector except services supplied "in the exercise of governmental authority." Since the GATS does not make any distinction between the different technological means through which a service may be delivered (e.g., in person, by mail, courier, or Internet), the supply of services by electronic means is, therefore, covered by the GATS in the same way as all other means of delivery.[137] The extent to which e-commerce is covered is determined by whether a specific service transaction delivered electronically is scheduled and whether any limitations or exemptions apply. Additionally, because e-commerce transactions usually depend on a range of other services (such as courier, distribution, and credit cards), it is also important to determine whether a Member has included such services in its schedule. In effect, therefore, the extent to which the disciplines of the GATS apply to a specific international e-commerce transaction can only be determined by examining the scheduled commitments of the Member states affected by the transaction, and by classifying what "mode" of delivery is involved in the specific transaction.

Members' schedules list commitments based on a services industry classification scheme that is unique to the GATS. It builds on the Central Products Classification (CPC) scheme developed by the United Nations but is not identical to it, nor does it necessarily correspond to national standard industrial classification schemes. The now universally applied Harmonized System administered by the World Customs Organization greatly facilitated the negotiation and implementation of trade agreement commitments in the realm of goods. Development of a similar scheme for trade in services would seem desirable. It would certainly facilitate the task of identifying the extent to which GATS applies to specific e-commerce transactions.

General Obligations

Part II of the GATS (Articles II-XV) sets out a number of general obligations and disciplines that apply to all services, regardless of whether a Member has included them in its schedule, as well as some obligations that apply only to sectors for which Members have taken commitments. Many of these are not particularly germane to e-commerce. A number of articles, however, have important implications for e-commerce, including:

?? Article II (Most Favoured Nation Treatment) sets out the basic WTO obligation to extend the same treatment to suppliers from any and all Members of the WTO.

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[136] The note by the WTO Secretariat prepared for the Council for Trade in Services (WTO document W/S/W/68 of 16 November 1998, paras. 2-8) provides a useful discussion of the issue of scope.

[137] The technology-neutral approach to scheduling commitments was developed in the negotiations on basic telecommunications conducted after the Uruguay Round was completed.

- ?? Article III (Transparency) establishes the fundamental requirement to publish and make all laws, regulations, policies, and measures relating to the operation of the GATS available to all Members and their suppliers.
- ?? Article VI (Domestic Regulation) requires that for those sectors for which a Member has taken commitments, it applies regulations affecting such sectors with a view to ensuring that they are transparent, non-discriminatory, and no more burdensome than necessary.
- ?? Article VII (Recognition) provides the framework of obligations within which Members can negotiate mutual recognition agreements related to qualifications and similar regulatory requirements and standards.
- ?? Article VIII (Monopolies and Exclusive Suppliers) sets out a number of disciplines that apply to monopoly or exclusive service providers, particularly where such suppliers compete with foreign suppliers who have accessed a market pursuant to a scheduled commitment.
- ?? Article IX (Business Practices) sets out a weak consultative obligation to address problems arising as a result of restrictive business practices.

We will return to some of these obligations in the discussion on Regulatory Issues.

Market Access

The core of the GATS can be found in Parts III and IV which provide for the negotiation of specific commitments to extend market access and national treatment, in whole or in part, to scheduled services. These commitments are set out in Members' individual schedules. Article XVI requires that specific commitments on market access must be extended on an MFN basis. It also specifies six types of restrictions that cannot be imposed once a country schedules a commitment, unless it expressly reserves its right to impose them in its schedule. They are limitations on:

- ?? the number of service suppliers allowed
- ?? the total value of transactions or assets
- ?? the total output of services
- ?? the number of natural persons employed
- ?? the type of legal entry through which the service is supplied (e.g., branch or subsidiary)
- ?? foreign equity participation or investments.

These disciplines apply in the case of e-commerce or Internet access services and suggest there is significant scope for the further development of electronic business. Of course, they only apply if a country makes a commitment in a specific sector. Additionally, since e-commerce transactions may not require any of the conventional service supply structures envisaged in the GATS, most of the above limitations are impractical. Of the six limitations, the first three are the most relevant to e-commerce, but if credit cards are the means of payment and there are no physical products to pass through a border, it will prove almost impossible to track and monitor the second and third anyway.

Article XVII provides that Members must extend national treatment to foreign service suppliers of scheduled services, but allows this obligation to be circumscribed by conditions included in the schedule. Thus, the extent to which this critical dimension of market access and non-discrimination applies to specific e-commerce transactions can only be determined by examining a Member's schedule.

Annex on Telecommunications

The specific obligations listed in the Annex on Telecommunications strengthen the obligations undertaken pursuant to scheduled commitments. As a result, it is clear that the WTO rules address the infrastructure on which e-commerce is dependent. The Annex applies to "… all measures of a Member that affect access to and use of public telecommunications transport

networks and services." Furthermore, the Annex includes a commitment to allow access to and use of telecommunications infrastructure to supply various other services:

> Each Member shall ensure that any service supplier of any other Member is accorded access to and use of public telecommunications transport networks and services on reasonable and non-discriminatory terms and conditions, for the supply of a service included in its Schedule. (par. 5 (a))

This is also directly relevant to e-commerce and the range of network services such as Internet access and switching services, among others, that make up the fast developing global information infrastructure.

In keeping with the technological neutrality of the GATS and its various annexes and schedules, this commitment applies regardless of the technology on which the public telecommunications transport network is based. That is, it is irrelevant whether the network is based on copper telephone wires, fibre-optic cables, cellular towers, satellites, broadcast, or any other technology that may be devised. The operative words are "access to and use of *public* telecommunications transport networks" and "for the supply of a service included in its Schedule." Here again, definition and classification of an electronically delivered service is critical to determining its treatment by any Member.

It is also important to remember that e-commerce is not a "sector" of the economy, but a means for the delivery of a wide range of goods and services. Only some aspects of the infrastructure for the delivery of e-commerce thus need to be specifically scheduled. Market access for most e-commerce will be determined by the access granted for the specific service transaction involved. The most important gap appears to be lack of explicit coverage of Internet service providers (ISPs).

A complication, of course, arises from the fact that e-commerce makes it possible for some services to be delivered without the appropriate authorities being aware that a transaction has taken place, giving the impression that they are not governed by the GATS. Thus e-commerce may facilitate market access because of the ease with which some requirements can be either avoided or evaded.

The application of some of the GATS disciplines affecting the quality and extent of market access can thus be more complicated than for more conventional transactions. While it is clear that GATS disciplines and commitments apply in each instance, regardless of the means by which the product is delivered, the capacity to apply these disciplines may be more difficult in the case of the electronic version. In many instances, therefore, the use of e-commerce would seem to make it easier to access a market. Whether governments would want to address this technological liberalization of markets remains an open question. From a broad consumer welfare perspective, of course, the solution would seem to lie in liberalizing the more conventional form of delivery rather than in restricting the electronic version. In the Caribbean context, e-commerce will also put pressure on governments to reconsider their restrictive services regimes.

The Agreement on Basic Telecommunications

The WTO Agreement on Basic Telecommunications (BTA)[138] marked a major step in liberalizing the development of the infrastructure needed to facilitate global e-commerce. When

[138] There is no single document that embodies the Agreement on Basic Telecommunication which has 69 signatories. Rather, the agreement comprises the following documents:

The Fourth Protocol to the GATS; Fifty-five supplementary schedules of commitments (including the EU as one); Nine lists of most-favoured-nation (MFN) exemptions; A Reference Paper on pro-competitive

its various elements are fully implemented, the market access provisions in the agreement will ensure that telecommunications companies can provide local, long distance, and international service through any network technology (either using their own facilities or reselling the capacity of incumbent carriers). During the negotiations on basic telecommunications in 1997, most national representatives at the WTO were focused on basic services such as voice and data transmission, paging, and mobile data services. Arriving at an agreement on basic telecommunications was difficult enough, as governments sought to protect their national telecommunications monopolies. E-commerce was still a conceptual leap for many governments.[139]

In addition to the liberalization initiatives in the telecommunications sector, the anticipated reductions in tariffs on products needed for information networks will also facilitate e-commerce. It is important to ensure that the reductions in tariffs agreed under the Information Technology Agreement take place as soon as possible and that more products are added to the list in order to benefit the rapid development of the global telecommunications and information network.

The original GATS telecommunication services list did not include Internet services. It is expected that they will be included in the new round of negotiations on services. It is important to distinguish between the commercial provision of access *to* the Internet from the supply of other services *via* the Internet. The commitments under the GATS on trade liberalization in basic telecommunication services will ensure better access to the essential infrastructure for e-commerce. However, in many countries in which telecommunication services are provided by a monopoly, that dominant provider is likely to be the only supplier of access to the Internet. It may be worthwhile to clarify the treatment of Internet access services in GATS schedules. In spite of the various market opening provisions (MFN, national treatment, and transparency) and other obligations in the GATS and its Telecommunications Annex, if a country does not list Internet access in its schedule, there is no obligation to grant access to foreign ISPs.

Only ten countries made specific commitments on the supply of Internet access services in the context of the negotiations on basic telecommunication services. This does not mean, however, that the remaining countries do not or will not grant access to foreign Internet access providers. It is expected that most countries will schedule Internet services in the new GATS negotiations as many businesses and governments are rapidly recognizing the commercial potential of the Internet. The use of Intranets and Wide Area Networks (WANs) means that foreign ISPs are already widespread except at the consumer level. Nevertheless, due to the crucial importance of adequate Internet providers to e-commerce, it would be useful to have Internet access specifically listed in the GATS services schedules as well as in the UN's Central Products Classification scheme.

Regulatory issues regarding e-commerce

Relevance of mode of supply

Since electronic commerce largely involves trade in services, the key issues involve the classification of those services in order to determine the extent of commitments that WTO Member governments have accepted and the obligations that result from these commitments. As noted earlier, GATS commitments are based on Members taking obligations based on one or more of the "modes" of delivery of a service. Discussion in the WTO and elsewhere suggests that there is, as yet, no consensus on whether certain electronic commerce transactions constitute

regulatory principles; and Two notes on scheduling methodology from the Chairman of the WTO Group on Basic Telecommunications (GBT).

[139] Most telecommunications schedules list only voice services, packet-switched and circuit-switched data transmission services, telex, telegraph, fax and private leased circuit services, and mobile services such as analogue/digital cellular, PCS, paging, and mobile data services.

mode one or mode two transactions. Some countries argue that electronic commerce transactions should be governed by the laws of the country where the provider of the service resides; others insist that they be governed by the laws of the country where the consumer resides. Resolution of this issue is critical to such domestic regulatory regimes as consumer protection and law enforcement. For instance, must an ISP block transmissions from pornographic sites to comply with the laws of the country of consumption or is it the responsibility of the country of residence of the Web site? What if the provider is resident in one country, connected to a server in a second, and providing pornographic videos to a consumer in a third country?

The issue has become even more salient by a lack of consensus on who has jurisdiction over mode two transactions. Generally, governments are prepared to assert jurisdiction over the delivery in their territory of mode one and mode three transactions. Less clear is whether governments retain jurisdiction over their citizens when they consume services delivered in a third country. The EU *Directive on Data Protection* in effect seizes some element of jurisdiction at both ends of modes one, two, and three, severely constraining both EU-resident consumers and non-EU resident suppliers. The United States has long been very aggressive in asserting extra-territorial jurisdiction over a wide range of commercial transactions. The EU Directive promises to create even more potential conflict.

GATS Article VI requires that WTO Members ensure that "in sectors where specific commitments are undertaken, … all measures of general application affecting trade in services [be] administered in a reasonable, objective and impartial manner." Unfortunately, there are no criteria to guide governments in the application of such measures to ensure that they "are not more burdensome than necessary." Specifically in relation to e-commerce, governments will need to find a basis for agreeing on what constitutes a "reasonable, objective and impartial manner" and what constitutes "an unnecessary burden."

If consensus emerges favouring a more proactive approach to international rules governing e-commerce, governments will have to take a different approach. They could set out certain criteria which would provide a basis for determining whether national regulations with respect to the enforcement of criminal and other laws, the protection of consumers, or the promotion of cultural diversity and national identity meet the two tests set out in GATS Article VI. Such rules, however, are more likely to emerge as part of generic negotiations than aimed specifically at e-commerce. Rules governing competition offer a good example of the benefits, and likelihood, of a generic approach.

Competition Issues

To a large extent, the Internet succeeds because it is a decentralized system that encourages innovation and maximizes individual freedoms. However, as a result of the original structure of the global network, rapid technological changes, and the economies of scale enjoyed by early entrants and monopoly suppliers, there are now concerns regarding the future of competition in this electronic medium.

GATS Articles VIII and IX address competition issues. Members must ensure that monopolies and exclusive suppliers do not abuse their positions in domestic markets and frustrate Members' MFN obligations. They are also expected to proscribe business practices that restrain competition and restrict trade in services. However, in an industry that depends so much on new technologies and constant repositioning through strategic partnerships and mergers, it is very difficult to address anti-competitive behaviour on the basis of such vague undertakings. The Reference Paper, annexed to the telecommunications schedules of those Members that participated in the basic telecommunications negotiations, also seeks to ensure competition and

reduce regulatory burdens on telecommunications service providers. It applies to all telecommunications services, irrespective of their categorization.[140]

The Reference Paper lists a series of principles related to competitive safeguards, inter-connection, universal service, transparency of licensing criteria, independent regulators, and objective, timely, transparent, and non-discriminatory use of scarce resources. Little detail, however, adds flesh to these bare-boned principles. The Reference Paper's ambiguity facilitated the conclusion of negotiations, but its implementation will require more explicit guidelines regarding the products and services that fall under its ambit and the changes in domestic regulation required to support its pro-competitive regulatory principles.[141] In effect, the Reference Paper provides little more than a framework for future negotiations. Without clear definitions and remedies, it is difficult to see how it could be enforced in all but the most blatant circumstances of anti-competitive behaviour.

For example, a dominant national supplier of telecommunications services and facilities, may also offer ISP services; it must also allow independent ISPs access to its facilities; nevertheless, it can use cross-subsidization to make it very difficult for independent providers to match its prices.[142] This issue is not addressed by the Reference Paper; indeed, as noted, there are no specific provisions in the GATS/Basic Telecommunications/Fourth Protocol/Reference Paper framework requiring governments to take commitments on access to facilities by ISPs.

IV. 2 Assessment of the Interests of the Major Players

OECD Countries

At the WTO the OECD countries, particularly the US, are particularly interested in maintaining the moratorium on customs duties on electronically transmitted goods and services. They are also interested in expanding the lists of products under the Information Technology Agreement (ITA). Another important issue for the Americans is the right to inter-connection with telecom networks to supply services relating to e-commerce. In keeping with its tradition of seeking the most liberal trade regime, the US also argues that there may be an advantage to a GATT versus GATS approach to e-commerce since the former will provide for a greater trade liberalization outcome.[143] In this way, if the GATT applied to digitized products, the numerous GATS MFN exemptions applying to content would not apply to electronically transmitted products. This is a troublesome issue for the EU because they excluded audiovisual services from their GATS commitments under a cultural reservation and excluded broadcasting from their telecom commitments.[144] At the same time, audio-visual services covers a wide range of entertainment products and services in which the US is highly competitive. To deal with this position, the US would like the EU to further open all its services sectors, and in particular, those that are relevant to e-commerce. It is interesting that there was no agreement at the WTO to declare that all products delivered electronically are services or that the GATS applies to all electronically delivered products under the Work Programme on Electronic Commerce.[145] Canada's position is

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140 For example, for e-commerce in particular, it is not useful that under the Agreement on Basic Telecommunications, the Internet may be regarded as an enhanced communications service, a basic telecommunications service, or even a broadcast medium. Furthermore, as technological changes and convergence in telecommunications and information technology continue, they will further complicate implementation of the agreement.

141 WTO (1998), S/C/W/74, p. 18.

142 This is a consistent complaint by ISPs in the Caribbean about Cable & Wireless and/or national monopolies.

143 See "Submission by the United States for the General Council, the Services Council and the Goods Council, Work Programme on Electronic Commerce," February 9, 1999.

144 The EU's schedule also states that their commitments exclude "content provision which requires telecommunications services for its transport."

145 See Progress Report to the General Council by the WTO Council for Trade in Services, 27 July 1999. (S/L/74)

similar to the US in many respects but suggested that the WTO should study the classification of electronic transactions with a physical equivalent.

Although the WTO's work on e-commerce seems to have informally ended, the US would like the WTO Members to eventually extend to trade in e-commerce the same general principles already applied to trade in goods: national treatment and most-favoured nation treatment. Furthermore, WTO rules should not discriminate against products like software delivered in digital form in favour of identical products delivered as physical goods.[146]

The services industry in the US suggested that in the GATS negotiations all countries should adopt an approach in which a critical mass of countries allow unrestricted commitments for all services that use e-commerce. In addition restrictions on the movement of natural persons should be eliminated. They also proposed that in order to promote e-commerce, there should be liberalization in a cluster of industries such as advertising, business, computer-related, telecom, distribution, financial and express delivery services.

The "cluster" approach presents its own difficulties and risks. For example, it may be difficult to identify and reach international consensus on all of the services that should be included in an e-commerce cluster. This could frustrate the negotiating process and jeopardize the results in all of the sectors involved. In order for CARICOM to respond to this type of proposal or to consider alternative negotiating formulas, it is important to properly identify the various layers of services upon which e-commerce depends. Equally important to CARICOM is to identify the services that will allow Caribbean firms to take advantage of e-commerce in overseas markets. What might the Region want to include in a cluster of core e-commerce services? What ancillary services might it be desirable to see included? Are there some services that Caribbean stakeholders might want to treat separately?

The GATS negotiations (particularly telecom) may prove critical to e-commerce in the long run. The EU wants Internet access classified as a basic telecom service and hence not subject to market opening but most other developed countries consider Internet access a value-added service.[147] It is still very premature to make any assumptions on the possible results of the GATS negotiations and their impact on e-commerce.

Developing Countries and the Caribbean

Various organizations such as UNCTAD, the World Bank and the Commonwealth Secretariat have studied the implications of the Internet and e-commerce for developing countries. In any services negotiation, whether regional or multilateral, and particularly in the current GATS negotiations, developing countries must negotiate access in developed country markets in sectors in which they can export services by electronic means. Although most LDCs are net importers of services, the Caribbean is a bit unique in that tourism and related services are strong sectors of competitive advantage. To date, although the OECD countries granted significant market access in some services sectors, the potential for export of services by LDCs through electronic means is limited.

The participation of developing countries in e-commerce should be enhanced by the implementation of Article IV[148] of the GATS, through the liberalization of market access in

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[146] In a speech to the Federal Communications Bar Association on October 23, 2000, the US Trade Representative stated that the US goals "include ensuring that our trading partners avoid measures that unduly restrict development of electronic commerce; ensuring that WTO rules do not discriminate against new technologies and methods of trade; according proper application of WTO rules to trade in digital products; and ensuring full protection of intellectual property rights on the Net."

[147] In most countries GATS schedule there are much weaker commitments on basic telecom services than value-added services because governments sought to protect domestic monopolies.

[148] This deals with the participation of developing countries and greater access for them in developed country markets.

OECD countries in areas of export interest to them. Furthermore, to develop e-commerce, LDCs need better access to technology, including technology relating to encryption and security of transactions and to efficient telecommunication services. It is in the clear negotiating interest of LDCs to reduce the existing restrictions on export of state-of-the-art encryption technology by some WTO Members.

Developing countries would also like WTO Members to take account of the revenue and other fiscal implications of e-commerce for them. The results of the work done in UNCTAD and the Committee on Trade and Development concerning developing country interests is important in this regard.

Furthermore, as a group LDCs would want to ensure that efforts to stimulate the development of e-commerce and Internet infrastructure should also be addressed in development assistance programmes. The importance of developing human resources and physical infrastructure in services and e-commerce is critical to LDCs.

To a large extent, efforts in most negotiations should also focus on the transfer of resources from the developed countries to LDCs to address the digital divide. In this regard, some of the areas for possible attention are:

?? Technical assistance for continued reform efforts in the telecommunications and regulatory field, and to help developing countries participate in forums where the global regulatory environment for the Internet and telecommunications is being discussed (e.g., ITU, WTO, WIPO, ICANN).
?? Research programs for better understanding the information and access needs of developing countries, and the most appropriate measures to address them in an Internet-centered environment.
?? Improving connectivity in LDCs by linking sparse and poor populations to government services and educational opportunities, giving access to the Internet, and making available to the rural poor specialized resources to make their economic activities more productive.
?? Supporting education programs that promote digital literacy through technical education and skills-building programs. This is necessary to reduce shortages that are a major constraint in many developing markets.
?? Stimulating Internet-based applications through incubators for application service providers (ASPs) and other small, niche ventures with low capital needs, to stimulate the growth of healthy small and medium-size Internet-related business.
?? Promoting the use of information and communication technology in government services. Such programs for supporting service reform with an IT component can include priority areas such as taxation, education and health.

The Caribbean's interests are largely synonymous with the interests of all LDCs and although incomes in this Region are higher than other areas like Africa and Asia, the cost of preparing for the digital economy can be staggering.

IV. 3 FTAA Discussions

In the FTAA discussions on e-commerce the Joint Government-Private Sector Committee of Experts on Electronic Commerce considered many of the issues that the WTO, OECD and other players also examined. However, the mandate of the Joint Committee was only to study the issues and gather information on the status of e-commerce and Internet readiness in FTAA countries. The Joint Committee has done a commendable job in proposing a series of useful recommendations to FTAA Ministers to facilitate e-commerce. The task is now up to

governments to get action on those recommendations. Some of the recommendations that are particularly relevant to CARICOM governments are:

Network Access/Competition

?? To promote the deployment of the bandwidth necessary to guarantee access to basic telecommunication services, FTAA Governments should update their regulatory frameworks to provide for greater private sector competition in telecommunication services. Policies that encourage competition, facilitate interconnection under reasonable conditions and allow private investment will help to reduce the cost of Internet access and use and promote telecommunications infrastructure development.

?? To provide Internet users in FTAA countries with the broadest range of information and services, FTAA Governments should promote access to public telecommunications networks on a non-discriminatory basis.

?? To promote the creation of local Network Access Providers (NAPs), which are local interconnection systems for transmitting data among different Internet Service Providers (ISPs).

?? To provide for the widest participation of their citizens and to increase their electronic commerce awareness and skills, FTAA Governments should promote Internet access points open to the public, such as in schools, libraries, community centers or public phone centers.

?? The topic of public statistics on electronic commerce and traffic could be considered for future work of the Committee.

Governments as Model Users

?? FTAA Member countries should promote and use electronic commerce in government-to-government, government-to-business and government-to-individual transactions, thus performing faster transactions at lower costs and with wider coverage. For example:

- the tender and procurement of goods and services;
- the delivery of governmental services;
- making available government information;
- the presentment of bills, taxes and benefits electronically;
- online completion of governmental forms;
- access to national intellectual property offices; and
- linking all governmental organizations and personnel electronically.

Smaller Economies

?? FTAA Governments, especially smaller economies, should encourage greater participation in electronic commerce in order to realize the benefits and avoid possible disadvantages.

?? FTAA Governments should continue to share information and experience on best practices with respect to policies that will encourage development, attract investment and promote the widest use of electronic commerce.

?? FTAA Governments, jointly with the private-sector, should consider the development and implementation of national strategies for electronic commerce.

Engaging Small/Medium Enterprises(SMEs) in Electronic Commerce

?? FTAA Governments should actively promote awareness among SMEs of the opportunities and benefits of electronic commerce and encourage its use as an efficient way for accessing international markets.

?? FTAA Governments and the private-sector should seek to undertake SME education and information campaigns, and make use of resources offered by local business organizations and local chambers of commerce.

?? To increase the participation of SMEs in international trade, FTAA Governments should explore ways to tailor their existing trade promotion programs to better support SMEs' penetration of foreign markets through the use of electronic commerce, such as virtual trade shows.

Another issue is the fact that there is a distinct lack of information in the Caribbean on the use of computers, access to the Internet and information technology in general. It would be a very

useful exercise for all CARICOM governments to take stock of national "Internet-readiness indicators" and complete the questionnaire circulated by the Joint Committee quite some time ago. To date, only one CARICOM government has submitted the necessary information to the Tripartite Committee that is providing support to the FTAA discussions. This exercise would provide valuable data for governments in the Region to target their limited resources and make decisions on future strategies, including requesting technical assistance from international donors.

It is unlikely that the FTAA Joint Government-Private Sector Committee will ever become a negotiating group because the issues are still unsettled and e-commerce is still a very dynamic area. E-commerce is not a sector *per se* and hence cannot fit into traditional negotiating structures. Furthermore, many of the Latin countries are skeptical about the direct benefits to them, given the clear interest and advantage of the United States in e-commerce.[149] What is more likely is that in the FTAA negotiations on services, there might be attempts to liberalize the services that are essential to e-commerce such as telecommunications, express delivery, computer consulting, certain financial services, among others. It is in the interest of CARICOM economies to support such liberalization.

The work of the FTAA Joint Committee has since been streamlined to four areas relevant to e-commerce transactions: (i) access to infrastructure; (ii) electronic payment systems; (iii) SMEs; and (iv) certification and authentication systems. In the Committee's work there was also a lot of exchange in terms of sharing of ideas on best practices and national experiences. The information and background materials developed through this process should be carefully studied by all CARICOM governments with the aim of adopting relevant practices and policies.

Two areas that need greater effort to optimize the benefits from the participation of the Region in the FTAA discussions are:

Greater participation by the private sector? although government represents the widest societal interest, private sector agents are best qualified to express the needs and concerns of entities that engage in e-commerce. To date, the Caribbean private sector has been absent.

Submission of papers to the Committee? there have been 70 submissions to date but no written submission from CARICOM. In order to properly represent its interests, the Region should table papers for discussion.

Furthermore, as a group, CARICOM should carefully identify which specific areas of e-commerce are in their strategic interest and pursue them in a focused way in the FTAA and all forums.

149 Similar concerns exist at the multilateral level.

SECTION V CONCLUSIONS AND RECOMMENDATIONS

CARICOM governments should see e-commerce as part of a broader process of economic, social and cultural change, characterized by the globalization of markets and the shift toward a global economy based on knowledge and information. Given the appropriate policy environment, e-commerce has the potential to act as a significant source of jobs and growth and increases in consumer choice. It also brings new challenges but the opportunities for increased efficiency and opportunity for governments, the private sector and individual citizens outweigh the costs. The governments that accept this potential need to act collectively with others to clarify and update the framework of national and international rules to ensure that they apply effectively to e-commerce.

Facing uncertain markets for their traditional commodity exports, and with increasing pressure on their financial services sectors, small Caribbean countries are looking for new economic opportunities. E-business and related Internet services might be means of supporting their narrow economies. With the appropriate telecom infrastructure, the Region could be ripe for hosting businesses from telemarketing and customer service call centres to Internet services of all kinds. However, more sophisticated types of e-businesses are not yet feasible. It is clear from the discussion above that the Region needs to do a significant amount of work in the infrastructure, financial, regulatory and human resource areas in order to really take advantage of e-commerce.

The prospect of new negotiations on services offers the opportunity to ensure that services critical to the development of e-commerce are liberalized. To succeed, CARICOM governments will need to develop consensus on some difficult issues, some of which may challenge traditional concepts of sovereignty. Nevertheless, they are the issues governments need to address if they are to come to grips with the full implications of a more integrated global economy, an integration that will accelerate as e-commerce becomes more widely accepted and available.

CARICOM's ability to influence the outcome of multilateral negotiations is very much conditioned by its ability to project a single voice and a credible capacity to implement the results. Thus, national governments and private-sector bodies need to develop strong, credible consultation and consensus-developing procedures that fully reflect stakeholder interests as broadly as possible. Indeed, the telecommunications situation in each CARICOM country is far from optimal and perhaps the biggest negotiation relating to Internet access and e-commerce will be **within** national borders.

In light of all the issues discussed above, the following recommendations should serve as an agenda for action:

Creation of an Information Society

1. All CARICOM governments should put in the necessary administrative infrastructure to ensure that data on key indicators of the digital economy are collectable and collected. In particular, they should attempt to compile national statistics on computer literacy and use, Internet access by households and businesses and number of ISPs, Internet hosts, Web servers, among others. As a first step, all governments should attempt to complete the questionnaire on Internet "readiness" indicators circulated by the FTAA Joint Committee on e-commerce as this will give a clear indication of the current state of information in this area and the work to be done.

2. All CARICOM governments should encourage the widespread purchase and use of personal computers and information technology among their general population by removing all import duties, taxes and other charges on computer hardware and software. As much as possible, incentives should also be given to stimulate the purchase of computers through

innovative programs such as soft loans and income tax deductions for the purchase of personal computers. The private sector should also be encouraged to do likewise.

3. All CARICOM governments should sign and implement the Information Technology Agreement (ITA) with the aim of reducing the cost and dissemination of information technology products.

4. All countries in the region must put more emphasis on developing home-grown Internet technology infrastructure and other Internet services. In this regard, they should try to implement policies that stimulate interest in and access to the Internet.

5. Governments should act as educators by increasing access to education programmes at all levels, in the areas of computer literacy, Internet usage, e-business, and associated technologies. They should also consider subsidizing training programs in information technology provided by private institutes where the public system cannot respond rapidly enough.

Universal Access

6. Governments should develop programs to ensure the provision of at least one computer laboratory in each high school and primary school.

7. Concerted efforts should be made to provide affordable access to the Internet for all Caribbean citizens. This can be done through community Internet kiosks or Internet cafes or other innovative means.

8. Regional leaders should pursue opportunities for technical assistance to address the growing digital divide between developed and developing countries. In this regard, the recent statement by G-8 leaders to support initiatives to address the "digital divide" should be seen as an opportunity to secure funding for providing greater access to and use of the Internet by Caribbean citizens.

9. All governments should ensure that the ownership and management of each country code top level domain (ccTLD) system is transparent and well-established. In principle, each ccTLD should be managed by a national independent authority, perhaps in the university system, not incumbent telecommunications monopolies, or foreign entities.

Telecommunications Infrastructure

10. The process to allow competition in the telecommunications industry in each country should be expedited since the lack of competition is the main reason for the high cost of services and a serious constraint to the rapid dissemination of new technologies that allow widespread high speed Internet access.

11. Governments should ensure that incumbent telecom operators allow interconnection and greater access to the public network. Furthermore, they should ensure that there are no restrictions on the introduction of new telecom technologies.

12. Pressure should be exerted on the main telecom carriers in the region that directly affect the pricing of Internet services to introduce flat rates for Internet access. The current regime in which customers must pay for subscribing to the service up a to certain number of hours plus extra charges per hour, as well as telephone charges for the time that they are online should be discontinued. The more people join each national telecom network, the more important it becomes.

13. The status of Voice Over Internet Protocol (VoIP) needs to be clarified by all CARICOM governments. For all intents and purposes, it should be classified as a value-added service and be opened to competition.

Facilitating Environment for E-Commerce

14. Each government should create a task force or committee consisting of officials and private sector representatives to develop strategies for facilitating and promoting e-business.

15. Governments should introduce legislation to provide the regulatory framework to facilitate e-commerce based on the UNCITRAL model covering issues such as the legal recognition of electronic documents and signatures, protection of personal privacy and other key elements critical to e-commerce.

16. Governments should ensure the protection of intellectual property in digital media. In this regard, CARICOM states should implement the Copyright Treaty and the Performances and Phonograms Treaty under the umbrella of WIPO.

Assistance to SMEs

17. Governments should also collaborate with the private sector to utilize the technical assistance and support provided by the International Telecommunications Union (ITU) to facilitate the establishment of e-commerce operations in developing countries to open markets abroad for local products.

18. It is advisable to provide funds for e-commerce incubators so that individuals and SMEs can start e-businesses. There is a definite and urgent need for special funding by governments to facilitate e-business startups by SMEs in the region.

19. Governments and chambers of commerce in the CARICOM should collaborate and, if feasible, jointly develop staging facilities in the US and Europe for handling the delivery aspects of e-commerce sales made by small Caribbean firms.

20. Governments should explore the establishment of a Caribbean Portal to create a single gateway or "face" for goods, services and information offered by the private and public sectors in the region.

21. A regional e-business skills development and exchange facility should be established in which consultants and technical experts with information technology, Internet and e-commerce-related skills can market their services without impediments across the region. In other words, there should be totally free movement of natural persons in this category in CARICOM.

E-government

22. CARICOM governments should introduce some e-business elements in their operations as soon as possible, particularly in procurement activities. This will promote efficiency and transparency in public sector operations and stimulate businesses to engage in online activities themselves. They should also examine how to better provide information to citizens on government policies and programs through the Internet.

23. A study on the use of the Internet and e-commerce in the context of the Single Market should be commissioned. It should identify how the Internet can be used in the CARICOM market by the public and private sector to overcome the challenges of spatial separation.

Negotiation Issues

24. The recommendations of the FTAA Joint Government-Private Sector Committee of Experts on Electronic Commerce should be implemented by CARICOM governments.

25. The Region should examine the e-commerce value chain and the cluster of related services that are important to CARICOM. It is also necessary to identify the services that will allow Caribbean firms to take advantage of e-commerce in overseas markets and concentrate on those in international negotiations, particularly the GATS negotiations.

26. CARICOM states should ensure that WTO Members take account of the revenue and other fiscal implications of e-commerce for them. The results of the work done in UNCTAD and the Committee on Trade and Development in regard to developing country interests are important in this regard. Perhaps it may also be worthwhile to ensure that the WTO work programme on e-commerce be re-activated and include issues of concern to CARICOM.

27. In all international negotiations, CARICOM should seek to reduce the existing restrictions on export of state-of-the-art encryption technology by developed countries. This is important because technology relating to encryption and security of transactions is critical to the development of e-commerce.

Annex 1

VALUE CHAIN IN THE INTERNET ECONOMY *

Internet Infrastructure Layer
This includes companies that supply products and services that help create an Internet protocol (IP) based network infrastructure, a pre-requisite for e-commerce. Some types are:
?? Internet backbone providers
?? Internet service providers
?? Networking hardware and software companies
?? Personal computers and server manufacturers
?? Security vendors
?? Fibre optics manufacturers
?? Line acceleration hardware manufacturers

The Internet Applications Layer
The products and services in this category build upon the IP network infrastructure and make it technologically feasible to perform business activities online. They include:
?? Internet consultants
?? Internet commerce applications
?? Multimedia applications
?? Web development software
?? Search engine software
?? Online training
?? Web-enabled databases (Oracle, IBM, SQL Server, etc.)

The Internet Intermediary Layer
Internet intermediaries increase the efficiency of electronic markets by facilitating the interaction of buyers and sellers on the Internet. They act as catalysts through which investments in the infrastructure and applications layers are transformed into business transactions and include:
?? Market makers in vertical industries
?? Online travel agents
?? Online brokerage firms
?? Content aggregators
?? Portals/Content providers (Yahoo, Excite, Geocities)
?? Internet as brokers
?? Online advertising (and the creative skills needed for multimedia)

The Internet Commerce Layer
E-commerce or e-business involves the sale of products and services to consumers or businesses over the Internet. A range of intermediary firms are now filling niches in this chain by supplying services that interface between supplier and user.
?? E-tailers (Amazon.com, etc.)
?? Manufacturers selling online (Cisco, Dell)
?? Fee/subscription based companies (WSJ.com)
?? Airlines selling online tickets
?? Online entertainment and professional services.

Note that many companies operate in multiple layers involving infrastructure as well as applications and commerce.

* "Measuring the Internet Economy" June 1999.

Annex 2

Fundamental Principles: the View from International Business[150]

Business believes that a number of fundamental principles should shape the policies that govern electronic commerce, if the promises of electronic commerce are to be fulfilled. In this context, we provide the following Policy Principles for Global Electronic Commerce. We expect that these Principles may be extended as additional knowledge and insights are gained.

1. The development of electronic commerce should be led primarily by the private sector in response to market forces.
2. Government intervention, when required, should promote a stable, international legal environment, allow a rational allocation of scarce resources and protect general interest. Such intervention should be no more than is essential and should be clear, transparent, objective, non-discriminatory, proportional, flexible, and technologically neutral.
3. Mechanisms for private sector input and involvement in policy making should be promoted and widely used in all countries and international fora.
4. In recognition of the global nature of electronic commerce, government policies which affect it should be internationally co-ordinated and compatible and those policies should facilitate interoperability within an international, voluntary and consensus-based environment for standards-setting. .
5. Transactions conducted using electronic commerce should receive neutral tax treatment in comparison to transactions using non-electronic means. Taxation of electronic commerce should be consistent with established, internationally accepted practices, and administered in the least burdensome manner.
6. Regulation of the underlying telecommunications infrastructure, when necessary, should reduce impediments to competition, enabling new services and new entrants to compete, globally, in an open and fair market.
7. Participation in electronic commerce should be pursued through an open and competitive market.
8. The protection of users, in particular with regard to privacy, confidentiality, anonymity and content control should be pursued through policies driven by choice, individual empowerment, industry-led solutions, and should be in accordance with law where applicable
9. Business should make available to users the means to exercise choice with respect to privacy, confidentiality, content control and, under appropriate circumstances, anonymity.
10. A high level of trust in the Global Information Infrastructure-Global Information Society (GII-GIS) should be pursued by mutual agreement, education, further technological innovations to enhance security and reliability, adoption of adequate dispute resolution mechanism, and private sector self-regulation.

[150] These principles were presented to Ministers at the Ottawa OECD Ministerial Conference on Electronic Commerce, Ottawa, 7-9 October 1998, and represent the collective effort of the Business and Industry Advisory Committee of the OECD (BIAC), the Global Information Infrastructure Commission (GIIC), the International Chamber of Commerce (ICC), the International Telecommunications Users Group (INTUG), and the World Information Technology and Services Alliance (WITSA).

Annex 3

WTO Findings and Conclusions[151]

In their detailed and very positive study, *Electronic Commerce and the Role of the WTO,* the WTO Secretariat officials responsible for the analysis reached some preliminary conclusions relating to the trade policy challenges raised by e-commerce. They provide a second important point of departure in considering the issues raised in this paper. They can be summarized as follows:

?? Greater availability of and access to infrastructure is a *sine qua non* of participation in e-commerce via the Internet.

?? Commitments under GATS on the liberalization of trade in basic telecommunications services ensure better access to the essential infrastructure for e-commerce; the coverage of supply of Internet access services in commitments under GATS may require clarification.

?? The WTO Annex on Telecommunications guarantees access to and use of public telecommunications transport networks and services.

?? GATS Articles VIII and IX and the reference Paper on Regulatory Principles guard against the impairment of market opportunities through the denial of access to networks.

?? The content of only certain digitalized information flows on the Internet may be seen as resembling trade in goods.

?? A range of transactions carried out through e-commerce is already covered under the structure and trade liberalization commitments of the GATS. Commitments under GATS create security of market access.

?? The most relevant modes of delivery for e-commerce are cross-border supply and consumption abroad.

?? Liberalizing services complementary to e-commerce can contribute to its development.

?? Trade facilitation via e-commerce can improve market access opportunities.

?? A large share of Internet-based e-commerce involves products protected by intellectual property rights, and intellectual property rights play an important role in the development of infrastructure and access-related equipment.

?? E-commerce and the Internet will affect the way intellectual property rights are administered.

?? A timely and effective implementation of the TRIPs Agreement is important for the future development of e-commerce, with key challenges arising from the borderless nature of the Internet.

?? The TRIPs Agreement and the new WIPO copyright treaties protect copyrights also for electronic transactions.

?? The TRIPs Agreement protects trademarks and other distinctive signs, which allows consumers to make more informed choices.

?? The use of trademarks poses a number of challenges, especially in relation to Internet domain names.

?? The need for regulation in some circumstances is beyond dispute – it is the design and administration off regulations that matter.

?? The GATS approach to regulation, modelled on GATT, emphasizes non-discrimination and "least-restrictive" interventions.

?? The nature of e-commerce may influence the manner in which governments seek to make their regulatory objectives, if not the objectives themselves.

?? E-commerce raises some jurisdictional questions regarding regulation that will influence the nature and content of inter-governmental cooperation.

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[151] These points are extracted from some of the sub-headings set out in chapter VI of *Electronic Commerce and the Role of the WTO,* 45-68.

GLOSSARY OF TECHNICAL TERMS

Application Service Providers (ASP)
Application Service Providers are third-party entities that manage and distribute software-based services and solutions to customers across a wide area network from a central data center. In essence, ASPs are a means for companies to outsource some or almost all aspects of their information technology needs. In e-commerce, they usually handle authentication and credit card processing and payments for companies selling online.

Asynchronous Transfer Mode (ATM)
ATM is a network technology based on transferring data in cells or packets of a fixed size. The cell used with ATM is relatively small compared to units used with older technologies. The small, constant cell size allows ATM equipment to transmit video, audio, and computer data over the same network, and assure that no single type of data monopolizes the line. Current implementations of ATM support data transfer rates of from 25 to 622 Mbps (megabits per second). This compares to a maximum of 100 Mbps for Ethernet, the current technology used for most local area networks (LANs). Some people believe that ATM holds the answer to the Internet bandwidth problem, but others are skeptical. ATM creates a fixed channel, or route, between two points whenever data transfer begins. This differs from TCP/IP, (the current Internet standard) in which messages are divided into packets and each packet can take a different route from source to destination. This difference makes it easier to track and bill data usage across an ATM network, but it makes it less adaptable to sudden surges in network traffic.

Analog(ue)
The transmission of sound and visual information in the form of waves in the frequency spectrum. For example, in an analog telephone transmission the human voice is transmitted as sound waves that can be detected by the ear. "Analog" transmission is now being superseded by "digital" forms of transmission in many instances.

Bandwidth
The capacity of a telecommunications network measured in terms of the amount of information it can carry in analog "hertz" or digital "bits" per second. For example, voice telephone calls can be handled effectively over a "narrowband" network using twisted pairs of copper wire, while video services require "broadband" networks using coaxial cables or fiber optic wires.

Originally, "bandwidth" referred to the capacity of a transmission system, expressed as the amount of digital data that could be moved through it per unit time. Prefixed with "high-" or "low-," bandwidth now also describes an Internet-based resource in terms of the demand its content or functionality places on the transmission system: "high-bandwidth" applications like real-time video conferencing are data-intensive. Low-bandwidth" content like plain text puts less strain on the transmission capacity of a network connection.

Baud
Older term being replaced by bps (bits per second). In an average data stream, one baud is roughly equivalent to one bit per second on a digital transmission circuit, a unit of digital transmission signaling speed of information transmission that is, the rate of information flow. Given in bits per second (bps) the rate is the highest number of single information elements (bits) transferred between two devices (such as modems or fax machines) in one second.

Bit
Bit is short for "binary digit," the smallest unit of measurement having values of 0 or 1. Bits are used to record the size of a data file on a computer, the capacity per second of a network, and so on. One character is typically eight bits of data, which is expressed in a related unit of measurement, the byte. An electronic string of bits represents letters and symbols. A kilobit is a thousand bits, a megabit is a million bits and a gigabit is a billion bits. Eight bits equal a byte.

Bits per second (bps)

The speed of a modem or network. A measure of the number of times per second information transmits over a telephone line or network. "kbs" denotes kilobits per second and "Mbs" denotes mega bits per second or million bits per second. 1 Mbs equals one million bits per second, or approximately 125,000 characters per second (assuming 8 bits per character).

Broadband network
A high-capacity telecommunications network capable of handling bandwidth-intensive services and large volumes of traffic. Measured in analog terms, a network designated as broadband would be at least 6 mega hertz. Measured in digital terms, it would be at least 1.5 megabits of data per second. Broadband lines are commonly used in the long-haul backbones of telecommunications networks, in specialized computer networks like local area or wide area networks, in cable television distribution, and so on.

Browser software
The multimedia software employed by users to access the World Wide Web, the aspect of the Internet that transmits pictures, sound, etc. At present, the most popular "browsers" include Netscape and Microsoft Explorer. Users can download these "browsers" from computer "servers" that are connected to the Internet.

Cable modem
A modem supplied by a cable television operator that allows users to access the Internet or other
information services over cable television networks. These networks consist of broadband coaxial cables and are capable of much greater speed than conventional twisted pair copper telephone lines.

Chat
Synchronous (real-time) communication over a computer network, involving at least two users. Text-based chat means that the users "talk" to each other by typing messages on their respective keyboards and monitor the flow of discussion as a scrolling dialog on the computer screen; to participate in such communication

Cyber-cash
On the Internet, customers often purchase products or services by giving their credit card information to a supplier, who then submits a debit to the customer's account with a credit card agency. Cyber-cash provides a new alternative, for which no one standard approach is dominant. In one configuration, a customer makes purchases recorded by a financial institution, which are then periodically aggregated for lump-sum billing to a credit card account.

In another configuration, a customer pays into an account set up by a company, which could be a traditional financial institution, or some alternative entity, and then makes purchases for which that special account is automatically debited. Some observers believe that cyber-cash will become an important source of competition with traditional financial institutions and will raise new policy challenges for governments.

Digital
The representation of information in the language used by computers, as a series of 0s and 1s, or binary digits. Digital technology is key to development of advanced information infrastructures and services.

Domain
A group of nodes on a network that form an administrative entity. It could also be a number of servers grouped together and named to simplify network administration and security. Every computer on the LAN belongs to at least one domain. Being logged in on one domain, however, does not limit resources in other domains to which the user has access permissions.

Domain Name
The unique name that identifies an Internet site. Domain names always have 2 or more parts, separated by dots. The part on the left is the most specific, and the part on the right is the most general. A given machine may have more than one domain name but a given domain name points to only one machine. Usually, all of the machines on a given network will have the same thing as the right-hand portion of their domain names, (e.g. mdns11.mdcc.edu/, email.mdcc.edu, and www.mdcc.edu) and so on. It is also possible for a domain name to exist but not be connected

to an actual machine. This is often done so that a group or business can have an Internet e-mail address without having to establish a real Internet site. In these cases, some real Internet machine must handle the mail on behalf of the listed domain name.

Fibre optic cable
A type of wire-line transmission media that converts information into light pulses that travel down hollow glass tubes the diameter of a human hair. Fibre optic cables are used in broadband networks, and are capable of carrying an enormous amount of information in all its forms --sound, graphics, data, and video, or a multimedia combination thereof -- with much greater speed, accuracy, and security than conventional copper wires and coaxial cables.

Firewall
A system for preventing unauthorized users from gaining access to a local network. Firewalls may use hardware, software, or a combination of both. There are three common firewall strategies: gateways restrict access to physical sections of the system or to particular software applications; proxy servers work by concealing the true network addresses of component machines; and packet filtering systems inspect every data packet entering or leaving the network, accepting or rejecting each on the basis of rules defined by the system administrator.

Frame relay
A packet-switching protocol for connecting devices on a Wide Area Network (WAN). Frame relay networks in the U.S. support data transfer rates at T-1 (1.544 Mbps) and T-3 (45 Mbps) speeds. In fact, you can think of frame relay as a way of utilizing existing T-1 and T-3 lines owned by a service provider. Most telephone companies now provide frame relay service for customers who want connections at 56 Kbps to T-1 speeds. (In Europe, frame relay speeds vary from 64 Kbps to 2 Mbps). In the U.S., frame relay is quite popular because it is relatively inexpensive. However, it is being replaced in some areas by faster technologies, such as ATM.

File Transfer Protocol (FTP)
A method of transferring one or more files from one computer to another on a network or phone line (e.g., the most commonly used dial-up protocols are xmodem, ymodem, zmodem and Kermit). The Internet has its own file-transfer protocol, called FTP, to transfer both binary and ASCII files, among computers on the Internet. Anonymous FTP, also known as 'anon FTP' is a service provided to make files available to the general Internet community (i.e., software and information files are stored on "anonymous" FTP servers to which there is public access and the login is anonymous).

Hypertext
A system of writing and displaying text that enables the text to contain links to related documents. Hypertext is able to handle graphics and sounds as well as text, and hypermedia documents can thus contain links to other forms of media - sounds, images and movies, as well as to other pieces of text. (In hypertext, selected words in the document are "expanded" -- i.e., linked to other text, file or picture documents.) Hypertext is used in the WWW.

Internet
The largest international computer network. It is a network of computer networks linking computers from colleges and universities, government agencies, institutions, and commercial organizations worldwide. These networks are able to communicate with each other because they all use the same protocol for sending data (i.e., TCP/IP). Some computers act as gateways connecting the various networks together. Owned by the U.S. government, until recently it was used primarily for research and educational purposes.

Internet Service Provider (ISP)
A company that provides access to the Internet. For a monthly fee, the service provider gives you a software package, username, password and access phone number. Equipped with a modem, you can then log on to the Internet and browse the World Wide Web and newsgroups (USENET), and send and receive e-mail and depending on your ISP, even develop your own Web site. In addition to serving individuals, ISPs also serve large companies, providing a direct connection from company's networks to the Internet. ISPs themselves are connected to one another through Network Access Points (NAPs). ISPs are also called IAPs (Internet Access Providers).

Internet telephony (VOIP)
Voice Over Internet Protocol - A category of hardware and software that enables people to use the Internet as the transmission medium for telephone calls. For users who have free, or fixed-price Internet access, Internet telephony software essentially provides free telephone calls anywhere in the world. To date, however, Internet telephony does not offer the same quality of telephone service as direct telephone connections.

Local Area Networks (LANs)
Ddata communication networks that are fairly limited in their reach - e.g., the premises of a building or a campus. They are private networks that facilitate the sharing of information and computer resources by the members of a group.

MHz
Megahertz. Refers to a frequency equal to one million Hertz, or cycles per second

Modem
A device that connects a computer to the telephone network. The word "modem" comes from the phrase "MOdulate-DEModulate" and refers to the way the device manipulates an electrical signal in order to encode information for transmission via the telephone network.

Multiplexing
Combining several signals for transmission on some shared medium (e.g. a telephone wire). The signals are combined at the transmitter by a multiplexor (a "mux") and split up at the receiver by a demultiplexor.

Portal
A Web site or service that offers a broad array of resources and services such as e-mail, forums, search engines, and on-line shopping malls. The first Web portals were online services, such as America Online (AOL), that provided access to the Web, but by now most of the traditional search engines have transformed themselves into Web portals to attract and keep a larger audience.

Search Engine
A search engine is a Web-based software tool that enables the user to locate sites and pages on the Web based on the information they contain. Hierarchical search engines organize known sites in "trees" that the user browses in order to find a site that deals with a particular topic. Yahoo (http://yahoo.com) is an example of hierarchical search engine. Free-form search engines typically present a form in which the user types words that specify the information sought. The search engine returns a hot list of pages containing those words. AltaVista (http://altavista.digital.com) and Excite! (http://excite.com) are examples of free-form search engines.

T-1 and T-3 lines

A T-1 is a dedicated digital telephone line connection supporting data transmission rates of 1.544 megabits per second. This is made up of 24 digital channels each of which supports 64 kbs. (The standardized 64 Kbps channel is based on the bandwidth required for a voice conversation.) The system uses four wires and provides full-duplex capability (two wires for receiving and two for sending at the same time). The four wires were originally a pair of twisted-pair copper wires, but can now also include coaxial cable, optical fiber, digital microwave, and other media. A number of variations on the number and use of channels are possible. Most small Internet providers have a T-1 (or a fractional T-1) line as their connection to the Internet. A fractional T-1 line refers to the rental of some portion of the 24 channels in a T-1 line. A full T-1 should accommodate from one to over 200 users and other services from an Internet provider. A T-3 line transmits data at 44.746 megabits per second. Larger sites have multiple T-1's or T-3's. To provide multiple T-1's or T-3's is more expensive, this requires more users or other services that will pay for the connection.

URL
This is the acronym for Universal Resource Locator, the Internet address of a specific resource. All URLs have at least two components: one part identifies the host computer on which the resource resides, and another part

identifies the destination that is the resource itself. An e-mail address is an example of a URL that includes only those two parts. But most URLs also include a third component? namely, the path of directories and subdirectories that must be traversed on the host computer to locate a destination file. Web Page addresses are almost always URLs of this more complex variety.

USENET
A worldwide bulletin board system that can be accessed through the Internet or through many online services. The USENET contains more than 14,000 forums, called newsgroups, that cover every imaginable subject of interest. It is used daily by millions of people around the world.

World Wide Web or Web
Short for "World Wide Web." The Web is a global, networked system of dedicated host computers that serve documents (files) formatted in hypertext markup language (HTML). These documents (or "Web Pages") can contain text, images and multimedia components, can include hyperlinks to other such documents on different servers, and can also act as interfaces, linking users with underlying special-function applications. The Web debuted in 1993, and its inception is commonly credited to Tim Berners-Lee of CERN in Switzerland. It was originally conceived as a platform-independent tool that scientists could use to exchange documents about their work. The Web can serve and display virtually any sort of digitized data including images, motion video, music and speech. Other recent advances in Web-based programming allow users to manipulate their own data using either remote computing resources or applications that reside online and download to the user's computer when needed. . Many people incorrectly equate the Web with the Internet. The Web utilizes the Internet as its transmission medium; they are not the same thing.

Web Page
A Web page is a document, the basic data storage and display unit of the World Wide Web. Stored as plain ASCII text, a Web page embeds "tags" or function and formatting codes which govern its transmission and display on the end-user's computer screen. These tags are standardized as HTML, the hypertext markup language.

Web Site
An electronic venue consisting of a collection of thematically related and hyperlinked documents (called "Web pages") and their component images, multimedia objects, etc. Web sites are identified by their addresses, called URLs.

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