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The Communications Industry in the Caribbean: Issues, Challenges and Opportunities

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This project convenes researchers and leaders within the private and public sectors to examine and provide substantive answers and policy prescription to current economic governance challenges facing the Caribbean region. The papers were initially presented at CIGI workshops, where their authors benefited from extensive comments and discussion on their work. Through this series, we hope to present and discuss policy issues pertaining to trade, investment, human capital, the fiscal outlook, and public sector management practices, among other issues relevant to the Caribbean region's economic future.



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Summary

Information and communication technologies (ICTs) can be a powerful enabler of growth and development. For the countries of CARIFORUM, beset by small internal markets, loss of preferential trade advantages, a downturn in demand for their traditional products and vulnerability to global economic pressures, the transformation to a knowledge-based, ICT-intensive society could assist in propelling the region toward desired levels of growth and development. However, access and affordability, lack of infrastructure, fragmented policy and regulatory frameworks and differential levels of educational attainment, among other issues, are hindering progress toward that goal.

In examining instances of effective and exemplary ICT policy applications in selected countries, this paper distills the critical qualities and interventions required for the Caribbean to benefit from global innovations in ICTs. The following developments are needed:

- The political will among regional governments to lead by example in providing the policy, legal and regulatory environments suitable for the ICT industry's growth.
- The creation of an investment-friendly environment that would attract foreign direct investment in ICT-intensive industries, while also encouraging local ICT-related entrepreneurship.
- Public and private sector investment in communications and general infrastructure to enable all social groups to have effective access to ICTs.
- Investment in ICT education and information literacy at all levels of the education system.
- The financing and promotion of research and development (R&D) at the tertiary level of the education system and among innovators in the private sector. This includes creating and managing the knowledge required for economic transformation.
- A proactive and innovative private sector willing to lead in the use and exploration of ICT and to take advantage of favourable policy and investment opportunities, where these exist.
- More integrated efforts among government departments and agencies in planning and implementing ICT strategies.

Acronyms and Abbreviations

ADSL	Asymmetric Digital Subscriber Line	OECD	Organisation for Economic Co-operation and Development
APUA/PCS	Antigua Public Utilities Authority/ Personal Communications Services	OECS	Organization of Eastern Caribbean States
BTC	Bahamas Telecommunications Company	OUR	Office of Utilities Regulation
BWA	Broadband Wireless Access	R&D	Research and Development
CARICOM	Caribbean Community and Common Market	RTBG	Rosheuvel and Partners Business Group (Suriname)
CARIFORUM	Caribbean Forum of ACP (Africa, Caribbean and Pacific) States	SMA	Spectrum Management Authority
CITO	Central Information Technology Office	T&T	Trinidad and Tobago
CONATEL	Conseil National des Telecommunications	TATT	Telecommunications Authority of Trinidad and Tobago
CSME	Caribbean Single Market and Economy	TELESUR	Telecommunications Company Suriname
CTU	Caribbean Telecommunications Union	TSTT	Telecommunications Services of Trinidad and Tobago
ECLAC	United Nations Economic Commission for Latin America and the Caribbean	TWTC	Trans World Telecom Caribbean Ltd.
ECTEL	Eastern Caribbean Telecommunications Authority	UNDP	United Nations Development Programme
EPA	European Partnership Agreement	WTO	World Trade Organization
EU	European Union		
FDI	Foreign direct investment		
GT&T	Guyana Telephone and Telegraph Company		
ICTs	Information and communication technologies		
ILO	International Labour Office		
ITU	International Telecommunications Union		
KPO	Knowledge-process outsourcing		
LIME	Landline, Internet, Mobile, Entertainment		
NGNs	Next-generation network services		

Introduction

The global information and communications industry has seen immense growth over the past two decades, with countries such as Ireland demonstrating the growth and developmental effects of increased investments in these technologies. The Caribbean to some extent has been part of this wave of modernization, regulatory reform and increased investments. The result has been expanded access and choice and the emergence of a competitive ethos in islands, including Jamaica and Trinidad and Tobago (T&T). However, investments have been mainly in mobile telephony and the region, as a whole, has yet to experience the subsequent levels of economic growth witnessed elsewhere. The cost of doing business remains high, a problem made even more profound by the reality of the region as a grouping of sovereign territories with individual policies and regulatory frameworks. Further, while limited regulatory reform has occurred, the Caribbean has yet to take greater advantage of the benefits of more open and liberal communications regimes. Indeed, the communications industry could play a greater role in regional development, particularly in facilitating economic diversification, reducing the cost of business, helping to forge greater links with its diaspora communities and in mitigating the ill effects of an expensive and inefficient inter-island and international transport network.

This study examines these and related issues, specifically identifying and assessing the challenges and potential for the communications industry to contribute to economic and

social development in the Caribbean. It also recommends ways to address some of the challenges to increasing the growth and developmental impact of Information and Communication Technologies (ICT). The paper focuses on the countries of CARIFORUM, which essentially consists of the mainly English-speaking member states of the Caribbean Community (CARICOM), as well as Haiti and the Dominican Republic. Section 2 presents an overview of the macroeconomic situation of the region, while Section 3 presents a brief review of some of the more pertinent literature on the link between ICT development and growth, along with case studies of select countries. Section 4 examines the state of the communications industry, as well as some of its major challenges, including convergence, technology, regulation and cyber crime. Section 5 identifies opportunities for economic development through a review of the innovations and overall experience in the global communications industry and an assessment of the Caribbean's potential in light of these international trends. In so doing, we identify the main implications for the Caribbean, and advance a number of recommendations on how the region can best position itself to take advantage of emerging technologies.

Overview of CARIFORUM: Key Issues and Challenges Facing the Region

The Caribbean region is a fragile and vulnerable grouping faced with low economic growth, declining competitiveness in traditional sectors and high unemployment, an

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important consideration in light of the proposed income-generating effect of ICTs. Unemployment continues to be a problem both economically and socially, leading to rising levels of crime and outward migration to more developed countries. Economically, the region is dependent on seasonal US and European tourism, remittances from its diaspora and a diminishing stock of agricultural crops.

Three distinct groupings of countries can be identified within the region. First, there are those with a high concentration of traditional agricultural crops such as sugar and bananas with very little value-added processing; this group includes the countries of the eastern Caribbean, Haiti and Belize. Over the years, dependence on preferential agreements has put these countries in a precarious position in the new dispensation of service-oriented economies. Second, there are countries, such as Suriname and Guyana that rely on natural resource extraction. Third, in a category of its own, is Barbados, which has invested in human capital and has topped the United Nations Human Development Index in its income band for many years.

Barbados, T&T and Jamaica had similar fortunes in the 1960s and early 1970s, but following the oil crisis of 1973 and other global financial instabilities, their economic trajectories began to diverge according to the different economic programs pursued by their respective governments.

The global economic crisis emerged as a major threat to immediate and future economic growth in the region, requiring a search for policies aimed at boosting the chance of economic survival in an increasingly competitive global economy. For example, in Jamaica, the crisis resulted in a severe slowdown in the bauxite and tourism sector resulting in the loss of jobs and incomes. This coupled with a decline in remittance funds saw the government seeking funding from the International Monetary Fund. In T&T, the sharp decline in oil prices in 2008 and 2009 resulted in an economic slowdown, which threatened social programs such as free tertiary education and health care. Regional policy makers concluded that the economic crisis has had negative effects “on the export of goods and services; on real income growth and on remittances” (Caribbean Development Bank, 2008). The possible decline in foreign direct investment (FDI), in turn, will affect the real income contributors in the economies of many small island states. Consistent with the patterns shown worldwide, this decline in real economic growth has been evident throughout the region (see Table 1).

Table 1: Real GDP Growth Rates, Selected Caribbean Countries and the World, 2006–2009

Country	2006	2007	2008	2009 (Projected)
	<i>(percentage change)</i>			
Bahamas	4.6	2.8	1.5	0.5
Barbados	3.3	3.2	1.5	0.5
Guyana	5.1	5.4	4.8	2.5
Jamaica	2.5	1.2	0.0	0.5
Trinidad and Tobago	12.0	5.5	3.5	2.0
Eastern Caribbean	6.3	5.3	3.1	1.5
The Caribbean	6.9	3.8	2.4	1.4
The World	4.0	3.3	2.5	1.0
Developed Countries	2.9	2.5	1.1	-0.5
Developing Countries	7.0	7.1	5.9	4.8

Source: ECLAC (2008: 4).

Such existing and emerging challenges have forced developing countries, including the small island developing states of the Caribbean, to identify new drivers of sustainable economic development beyond traditional sectors such as bauxite and agriculture, and toward an increased emphasis on trade in services. In this regard, the CARIFORUM countries have been moving at varying speeds toward creating more service-oriented economies, mainly through tourism, banking, telecommunications and cultural industries. This is consistent with an increasing realization of the importance of economic diversification. It is within this context that many countries have begun to systematically explore the opportunities offered by ICTs.

ICT and Development: A Comparative Review

Since the 1990s, the link between ICTs and economic development has been increasingly debated.¹ Waverman, Meschi and Fuss observe that “a developing country that had an average of 10 more mobile phones per 100 population between 1996 and 2003 would have enjoyed per capita GDP growth that was 0.59 percent higher than an otherwise identical country” (2005: 2). Their analysis supports the current view that mobile telephony has a positive and significant impact on economic growth, especially in

¹ See, for example, Lau and Tokutsu (1992); Daveri (2000); Röller and Waverman (2001); Colecchia and Schreyer (2002); and Kuppusamy, Pahlavani and Seleh (2008).

developing countries. A recent World Bank econometric analysis of 120 countries shows that, for every 10 percentage point increase in the penetration of broadband services, there is an increase in economic growth of 1.3 percent (Khalil, Dongier and Qiang, 2009).

According to the Organisation for Economic Co-operation and Development (OECD, 2007), the telecommunications industry is being transformed, and voice services are the key driver in the telecommunication markets of OECD member states. Voice over Internet Protocol (VoIP) and expanding mobile telephony services are changing voice markets significantly, causing shifts in the structure of telecommunication revenues and market projections. Broadband is becoming the dominant technology for integrated voice, data and image transmission, and multi-play systems offer Internet, video, voice and data over a variety of platforms. The global communications industry continues to grow at an above-average rate, with the fastest rates occurring in the larger industrializing countries. For instance, between 2000 and 2005, Brazil, Russia, India and China increased their expenditure on ICTs from US\$114 billion to US\$277 billion. This has outstripped global growth significantly, which clocked just over 4.5 percent.

Yet studies show that, in countries such as the Philippines, Indonesia and Thailand, ICTs have made no significant positive contribution to economic growth, as a result of low rates of ICT

adoption and technology transfer and low levels of ICT literacy and rates of ICT-related investments. These characteristics are typical of many developing countries. Furthermore, the import-intensive nature of ICT investment and inputs may limit the macroeconomic contribution of ICTs in developing economies. In general, the exports of most developing countries are concentrated on low-end consumer goods and raw materials, while some depend greatly on service industries such as tourism. With the rise of the global knowledge society, however, it is evident that the required strategies for growth and development should incorporate investment in knowledge and human capital. It is therefore instructive to examine some of the factors that could lead to a positive link between ICTs and economic development. To this end, the experience of countries such as Australia, Ireland, Malaysia, Singapore and Costa Rica provide important examples to inform the path to more beneficial investments in competitive knowledge economies.

Box 1, for example, illustrates some significant features in ICT development in Ireland. The transformation of the Irish economy from an emphasis on agriculture and manufacturing to an economy based on information technology and knowledge contributed to a rapid increase in per capita income in that country. Irish efforts to attract foreign companies through a policy of “industrialization by invitation” bore fruit with the entry of firms into specific sectors, including computer electronics and software. Concurrently, Ireland increased investments in education, especially in technical subjects.

Box 1: ICT and Development: The Irish Experience

Telecommunications in Ireland during the 1980s was often cited as being the worst in Europe. However, by 1984 the sector had been made a state-owned enterprise with a businessman being placed in charge of the company.

The company avoided the practice of inflating international prices to subsidize local calls — a feature of Caribbean telecoms industry up to recently. Prices were reduced (28 percent 1985-1991, versus the 3 percent OECD average over the same period) while making then-emerging technologies affordable and accessible for businesses. Competitive international rates, in turn, made the country more attractive to international firms wishing to headquarter their European operations in the country, as the dominant service provider became more responsive to export-oriented businesses. Growth was also realized in the local software industry with significant investment in this area (also in telecoms) from the US. These changes were driven by some recognition at the policy and business level

that the sector as it existed in the late 1970s and 1980s “was an impediment to Irish economic growth and job creation” (Burnham, 2003: 544). The key was to engineer an overall organizational and cultural change in the sector towards more reliable and less costly communications.

The majority of jobs created in the 1990s were in areas that benefitted directly from cheaper, more reliable telecommunications services (for example, financial services). Other growth areas included processing and marketing operations as well as customer care. Improved telecoms and lower rates were welcomed by the diaspora in countries such as Australia.

Interestingly, the incumbent telecoms operator also actively lobbied international firms to establish offices in Ireland. Some of this was done with the help of the Industrial Development Authority (IDA), indicating the value of joined up planning and partnership among government agencies (including SOEs) in the planning and execution of any development/growth agenda.

Sources: Burnham (2003); Minto (2009b).

The suggestion here is not that ICT was singularly responsible for Ireland's development; rather, as Burnham notes, "fortune favours the well-prepared" (2003: 37). As such, the Irish progress (notwithstanding the effects of the global financial crisis) demonstrates the potential importance of planning and effective policy making, particularly at the government level, in facilitating the growth of an ICT-based economy. In so doing, it also offers an explanation for the distinction between findings in the developed OECD countries versus those in the developing world – that building an information society and realizing development gains from investment in ICT may have to go hand-in-hand with other improvements in the economy.

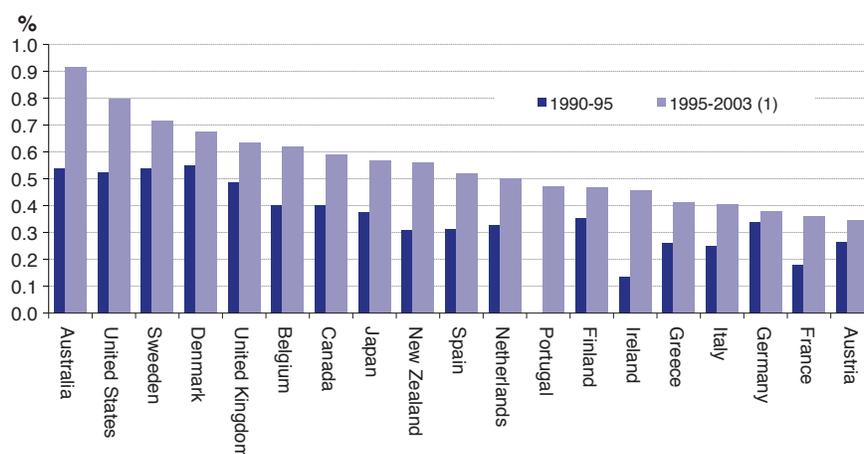
Thus, even as the role of ICT is acknowledged in Ireland's growth, it is important to note that ICT development is not an end in itself, nor can it account for growth in and of itself. Rather, commensurate improvements in education (particularly in science and technical subjects) and an investment-friendly environment, matched with more concerted action among government agencies to ensure wide support and consistency across organizational boundaries, are important in making good on investments in ICT. Further, the capacity to take advantage of the spill-over effects of advancements in ICT, coupled with other favourable macro policies (for example, fiscal restraint), allowed Ireland to witness the growth it enjoyed until the global economic crisis witnessed mainly between 2007 and 2009.

Similar accounts relate to the transformation of the Australian, Singaporean and Malaysian economies. In Australia, the creation of an investment-friendly

environment has made it conducive to businesses seeking to reap the benefits of ICT adoption. Since 2000, there has been a rapid increase in online business transactions, supported by a strong legal and regulatory environment and security infrastructure. The adoption of ICT by households has also been high, enabling many e-commerce activities such as retailing, thus fuelling economic growth. Figure 1 shows the rate of increase in the contribution of ICT to economic growth in various OECD countries. In Singapore and Malaysia, strategic ICT policies have been the foundation of the development of a knowledge economy (see Kuppusamy, Pahlavani and Seleh, 2008). Both countries also placed significant emphasis on R&D and reorienting the educational system to one with a strong ICT focus.

Costa Rica, like the CARIFORUM countries, had a history of dependence on a few agricultural products. However, in seeking to enhance competitiveness the government focused on technology, rather than seeking FDI for labour-intensive industries. With a policy aimed at using ICTs to push economic growth and a base of strong IT education among the population, Costa Rica has been successful in attracting major ICT companies focused on the manufacturing of computer chips and other products. This, in turn, has had a significant and positive impact on the economy. The programs implemented by the government include a reduction in computer taxes, the establishment of computer labs in schools, the introduction of computer technologies at the primary level, innovation and training at the tertiary level, e-government initiatives to offer service to citizens and significant investment in infrastructure.

Figure 1: Contributions of ICT Investment to GDP Growth, OECD Countries, 1990–1995 and 1995–2003



Note: The data for Australia, France, Japan, New Zealand and Spain are for the 1995–2002 period. Source: OECD (2005).

From such international experience, common variables can be identified as requirements for successful ICT intervention to achieve economic growth. These include:

- The political will among regional governments to lead by example in providing the policy, legal and regulatory environments suitable for the growth of the communications industry;
- The creation of an investment-friendly environment to attract FDI in ICT-intensive industries, while also encouraging local ICT-related entrepreneurship;
- Public and private sector investment in communications and general infrastructure to enable all social groups to have effective access to ICTs;
- Investment in ICT education and information literacy at all levels of the educational system;
- The financing and promotion of R&D, specifically at the tertiary level of the educational system and among innovators in the private sector, including creating and managing the knowledge required to transform the economy;
- A proactive and innovative private sector willing to take advantage of favourable policy and investment opportunities; and
- More collaborative effort among government departments and agencies in planning and implementing ICT strategies.

The Current State of Communications Development in the Caribbean Region

The CARIFORUM region has been identified as having one of the most robust ICT markets, with new mobile telecommunications subscriber growth estimated at 50 percent per year between 2003 and 2007 (see Buddecomm, 2008). In some instances, increasing access to mobile telephony has helped to fill gaps due to the inability or unwillingness of fixed-line providers to meet demand. Ironically, this has led to declining levels of teledensity — that is, the number of fixed telephone lines per 100 people — in islands such as Jamaica (Minto, 2009a).² This has been due mainly to the liberalization of the sector and the entrance of overseas foreign investors across the region. By 2005, 90 licensed operators were reported to exist across the region, with competition existing in most countries (see Table 2).

² However, within the past three or years or so, the incumbent, Cable and Wireless (LIME), has begun placing added emphasis and investments in its fixed-line business as its customers give up their fixed lines for its competitors’ mobile offerings.

Table 2: Main Telecommunications Companies, Selected Caribbean Countries

	Current Market Status	Main Players
Antigua and Barbuda	Competition in mobile and Internet	APUA/PCS, LIME, Cingular, Kelcom Int.
Bahamas	Duopoly in fixed voice, monopoly in mobile and CATV, Internet liberalized	BTC. Cable Bahamas, Indigo
Barbados	Fully liberalized, 2005	LIME, Digicel, TeleBarbados, Antilles Crossing, Kelcom Intl.
Belize	Fully liberalized, 2002	Belize Telecommunication Ltd., Speednet
Dominica	Fully liberalized, 2003	LIME, Digicel, Orange ¹
Dominican Republic	Fully liberalized, 1992	CLARO, Codetel Orange Dominicana
Grenada	Fully liberalized, 2003	LIME Global Network Providers, TWTC, Digicel
Guyana	Domestic Mobile liberalized (competition since 2001)	GT&T, Cel*Star, CTL, Digicel
Haiti	Mobile liberalized (1995)	Conatel Teleco, Haitel, Comcel, Digicel, Rectel
Jamaica	Fully liberalized, 2003	LIME, Digicel, CLARO, FLOW
St. Kitts and Nevis	Fully liberalized, 2003	LIME, Digicel, Caribbean Cable, St. Kitts Cable, Cariglobe
St. Lucia	Fully liberalized, 2003	LIME, Digicel, Antilles Crossing
St. Vincent/ Grenadines	Fully liberalized, 2003	LIME, Digicel, Kelcom Intl.
Suriname	Monopoly in fixed and broadband. Mobile liberalized, 2008	Telesur, RTBG, Digicel
Trinidad and Tobago	Fully liberalized, 2004	TSTT, Digicel, FLOW

Sources: Adapted from Stern (2006a); ECLAC (2009).

The dominant player in the mobile markets in Jamaica, T&T and Barbados is Digicel, an Irish-based firm. Digicel is also largely responsible for increasing mobile telecoms access in Haiti, a move that has facilitated greater interaction between the Haitian diaspora and their families in that country. To date, Digicel has invested more than US\$750 million in Jamaica and US\$260 million in Haiti, with

similar investments in T&T and the rest of the region.³ These investments have contributed significantly to the economies of the various countries through the creation of jobs both directly and indirectly. Cable and Wireless (the former monopoly provider) remains a strong competitor, while new entrants such as CLARO (owned and operated by América Móvil) also offer more choice to the public.

As Caribbean countries reach a saturation point with respect to mobile voice telephony, they are now moving toward other areas, including broadband Internet and “triple play” — the combination of voice, data and video delivered over one communication platform — given the relative low levels of access and connectivity. Consistent with global trends, Jamaican authorities have already revised universal access policy to place the focus on broadband access, while the Bahamas and the Organisation of Eastern Caribbean States (OECS) have also begun shifting attention to this area. However, while access to basic telephone service is significant, access to the Internet remains low. For example, in Jamaica, while mobile teledensity among the poor was at 97 percent in certain demographic groups, among other groups it exceeded 100 percent (that is, some people have more than one mobile phone) (Dunn, 2007a; 2008). In contrast, household broadband access in Jamaica was estimated to be 21 percent of households (see Dunn, 2007a). The level of penetration of computers in households across the region ranges between 1.03 per 100 persons in Haiti to 15.36 per 100 persons in Antigua and Barbuda. While this is almost on par with the average for the Americas as a whole, it is low compared with estimates for countries such as Canada, with 30.85 PCs per 100 persons, and the United States, with an estimated 23.56.⁴ In some Caribbean countries, however, there is little relationship between the extent of PC penetration and the number of Internet users. Unlike in North America, where access to PCs usually implies access to Internet, in the Caribbean the exorbitant cost of accessing the Internet is the usual prohibiting factor for individual access. Therefore, most persons access the Internet from public access points or businesses where there are multiple users per service.

In many of the smaller regional markets, there is still great dependence on dial-up services. In terms of Internet usage and broadband penetration, 2007 data from the ITU

indicate that Bermuda, an associate member of CARICOM, is the highest-ranked member state, followed by Barbados. Thereafter, the level of broadband penetration is quite low, demonstrating the varied levels of underdevelopment, which exist within the region. The low levels of penetration relate to the high cost of the service (Table 3) and its limited reach in rural and urban areas. Here, usage is mainly by businesses that can underwrite the expense and whose competitiveness depends on good connectivity. Stern (2006b) notes that, at the time of his study, access to broadband Internet services cost US\$15 per month in the United States and between US\$24.30 and US\$31.30 in Canada, depending on the technology used, while in the Caribbean the cost ranged from US\$54.70 in St. Lucia to as high as US\$265.00 per month in Belize (also see Table 4). Competition has reduced prices somewhat, but the cost of access remains high.

Table 3: Cost of Broadband Access 2005/2006

Country	Technology	Down (Speed Kbps)	Up	US\$/Month
US	ADSL	768	128	15.00
Canada	Cable	600	128	24.30
Canada	ADSL	1,000	–	31.30
Antigua and Barbuda	BWA	128	64	181.39
Bahamas	Cable	1,000	256	10.70
Barbados	ADSL	768	128	86.30
Belize	ADSL	1025	256	265.00
Cayman Islands	BWA	512	256	72.30
Dominican Republic	ADSL	768	512	49.80
Grenada	ADSL	512	128	73.00
Jamaica	ADSL	256	128	55.00
St. Lucia	ADSL	512	128	54.70
Trinidad and Tobago	ADSL	256	64	72.55

Source: Stern (2006b).

³ Reuters (2008). Digicel’s investment in the Caribbean and Central America is estimated to have exceeded US\$2.0 billion by 2008 (see www.digicelgroup.com).

⁴ Data from the ITU World Telecommunications/ICT Indicators Database.

Table 4: ICT Price Basket Index, 2008⁵

	ICT Price Basket	Fixed (% of GNI/capita)	Mobile (% of GNI/capita)	Broadband Internet (% of GNI/capita)
Singapore	0.4	0.3	0.2	0.8
USA	04	0.5	0.4	0.4
Sweden	0.5	0.6	0.2	0.8
Ireland	0.8	1.1	0.5	1.0
Australia	0.9	0.9	0.9	0.9
Trinidad & Tobago	1.1	1.7	0.7	1.1
Costa Rica	1.9	1.0	1.0	3.7
Malaysia	1.9	0.9	1.1	3.8
Barbados	3.9	2.7	1.6	7.3
Grenada	4.1	3.0	1.9	7.5
Jamaica	5.1	3.5	2.3	9.7
St. Lucia	5.7	2.5	2.6	12.0
Dominican Republic	5.8	4.9	3.1	9.5
Dominica	6.6	3.1	3.1	13.5
St. Vincent and Grenada	7.4	3.1	3.4	15.7
Guyana	18.3	2.4	6.9	45.7
Cuba	45.6	13.5	23.3	1671.8

Source: ITU, 2009

Table 5: Statistics on Fixed, Mobile Teledensity, Internet and Broadband Access, Selected Caribbean Countries, 2008

	Total Tel	Per 100 inhabitants	Mobile Subs/100	Mobile as a % of total tel.	Internet Subs/100	Internet Users/100	Broadband Users/100
Antigua and Barbuda	174.6	210.90	164.99	78.2	16.08	78.52	15.19
Bahamas	506.9	153.00	106.79	73.8	10.59	42.35	10.15
Barbados	486.0	165.37	114.33	69.1	–	63.97	20.45
Belize	191.2	65.08	54.49	83.7	2.66	11.12	2.62
Bermuda	117.8	182.85	93.32	51.0	58.82	74.42	36.71
Cuba	1,435.3	12.74	2.94	23.1	0.30	12.87	0.02
Dominica	106.4	149.72	125.18	83.6	7.67	37.22	9.14
Dominican Republic	8,196.2	82.75	72.80	88.0	3.44	25.87	2.28
Grenada	88.6	83.94	56.86	67.7	10.30	21.77	9.60
Guyana	391.5	52.12	37.45	71.9	6.39	25.75	0.27
Haiti	2,608.3	27.18	32.82	95.8	1.04	10.42	–
Jamaica	3,039.3	111.43	99.82	89.6	3.81	56.45	3.58
St. Kitts and Nevis	94.4	218.63	171.30	80.6	–	34.72	22.22
St. Lucia	210.5	126.23	101.69	80.6	9.28	59.96	8.39
St. Vincent	152.9	126.23	107.51	85.1	8.06	54.54	7.74
Suriname	401.5	88.83	70.80	79.7	1.83	9.61	0.59
Trinidad and Tobago	1,817.1	136.29	113.24	83.1	6.13	15.96	2.66

Source: ITU's World Telecommunication/ICT Indicators Database, 2008

5 Chapter six of the ICT Development Index presents a detailed explanation on how the index is calculated.

Other challenges, relating generally to accessing public goods, also affect the spread and use of communications technology across the region. For instance, much of the rural population of Guyana and Haiti lack not only phone lines but also access to electricity. The remoteness of some of these areas from the network bases in the national capital, as well as the cost of computer equipment, renders connectivity uneconomical, and communications access continues to be served by traditional means such as community radio.

Fixed telephone penetration, an index often used to measure the state of development of telecommunications infrastructure, varies from a high of about 50 percent in Barbados, Antigua and Barbuda, and St. Kitts and Nevis, to a low of 1.7 percent in Haiti. Similarly, there is a wide disparity in the penetration rates of cellular mobile, Internet access and usage. Table 5 shows the connectivity status of some Caribbean countries as of 2008.

One measure of the state of ICT development is the International Telecommunication Union's (ITU's) ICT Development Index (IDI), which looks at three primary factors: ICT readiness, infrastructure and access; ICT use (adoption and intensity) and ICT skills (the capacity to use ICTs effectively). Table 6 compares some of the 158 countries for which data have been calculated for the index. Most geographic regions measured significant improvement in ICT development between 2002 and 2007, with the Caribbean region registering an improvement of 34.9 percent, compared with 48.5 percent for North Africa, 48.2 percent for Eastern Europe, 42.0 percent for Central America and 20.8 percent for already well-connected North America.

Table 6: IDI Indicators, Selected Countries, 2002 and 2007

Economy	Rank in 2007	IDI, 2007	IDI, 2002
Sweden	1	7.50	6.05
Australia	14	6.58	5.02
Singapore	15	6.57	4.83
United States	17	6.44	5.25
Ireland	18	6.37	4.36
Malaysia	52	3.79	2.50
Jamaica	53	3.78	2.79
Trinidad and Tobago	56	3.61	2.50
Costa Rica	66	3.41	2.54
Dominican Republic	90	2.65	1.97
Cuba	95	2.53	1.94
Haiti	136	1.27	1.05

Source: ITU (2009).

Cable Television, Broadcasting and New Media

Although traditional radio remains the most widespread mass medium in the region, with growth in privately owned, niche and community-based stations, for other forms of communication the most significant development has been the breaking of government monopolies on television with the emergence and growth of independent television content providers. In Jamaica, for example, some 15 cable channels now transmit local content. There has also been some growth of so-called new media⁶, however, smaller operators have not been able to incorporate converged services in their operations, due inter-alia, to the capital costs involved, as well as the absence of workers with the relevant skills. Generally, developments in the region reflect the broader shift from traditional media to new media that is happening globally, but the change is slow due to challenges presented by low levels of Internet and broadband penetration.

ICT Infrastructure, Institutions, Policy and Regulations

Many countries are well advanced in terms of having fully digitized networks. Also, with the region's close proximity to North America and the increasing emphasis on services and exports across the region, many countries have sought to modernize their communications systems so as to compete more effectively. To this end, there has been much development in the provision of fibre optic rings connecting the region to the mainland United States and providing high-speed access to converged services. In 2005, there were about 20 fibre optic submarine cable systems (with more under construction), of which 14 served the region primarily. There were also 34 geostationary systems with footprints across the region. However, despite the existing infrastructure with enough bandwidth capacity to serve the region, not all countries have adequate access, which results in high bandwidth prices. Thus, while there is relatively good telecommunications infrastructure in the Caribbean, its distribution is uneven and expensive (Stern, 2006a).

The institutions responsible for managing, promoting and regulating ICTs are as important to the sector's development as the connectivity and access issues raised here. In several countries, the responsibility for ICTs lies with ministries responsible for communications. In others,

6 "New media" refers to anything that is related to the Internet and covers a wide array of content carriers, including Internet news, entertainment and electronic mailing, electronic/mobile billboards, mobile and digital cameras, gaming devices, global positioning systems, digital high-definition television and satellite radio.

the responsibility lies with ministries responsible for business and commerce. In a few cases, the responsibility is fragmented and spread across a number of agencies, which hinders the coherent development of the sector. In Barbados, for example, government agencies involved in managing the sector include the Attorney General's Office (responsible for broadcasting), the Prime Minister's Office (responsible for government data and information systems), the Ministry of Public Utilities (responsible for telecommunications) and the Ministry of Commerce, which recently was mandated to undertake the development of the country's ICT strategy. The many tiers of responsibility remain a barrier to progress despite the achievements Barbados has made in connectivity and competition in services and products.

In Haiti, the Ministry of Public Transportation and Communication is responsible for telecommunications while the Ministry of Education is responsible for content development. Haiti is a unique case in that political instability has prevented regulatory structures from functioning transparently. As a result, despite significant private sector interest, investments have been constrained by the ill-defined role of the regulator, lack of transparency, shifting standards, high licensing fees and rates and an absence of consultative processes to facilitate information sharing. As of the first half of 2009, no board had been constituted to oversee the operations of the state regulator, le Conseil national des telecommunications (CONATEL), which is also in the unusual position of developing national ICT projects while regulating the overall telecommunications industry.

In some countries (for example, Jamaica and T&T), the policy making and regulatory institutions that have been established are in line with global standards. In Jamaica, the Office of Utilities Regulation (OUR), the Broadcasting Commission and the Spectrum Management Authority (SMA) are effectively functioning institutions, even if somewhat splintered in their effect on the country's ICT regulatory environment. Similarly, the Telecommunications Authority of Trinidad and Tobago (TATT) is an established institution. Within the smaller territories of the eastern Caribbean, there has also been considerable progress in adapting regulatory structures to the needs of multiple microstates operating at common levels of development. The Eastern Caribbean Telecommunications Authority (ECTEL), which brings together the ICT regulation of five countries (Dominica, Grenada, St. Kitts and Nevis, Saint Vincent and the Grenadines and St. Lucia), actively promotes market liberalization and competition in the telecommunications sectors of the contracting states.

The Caribbean Telecommunications Union (CTU) was established by the heads of government of CARICOM in 1989 (CTU, 2008). The CTU's objectives relate to coordination, collaboration, harmonization and information sharing in the telecommunications sector among member countries. Its mandate also extends to capacity building and the establishment and maintenance of linkages with relevant international agencies such as the ITU. The CTU enjoys the legal right to contract, acquire and dispose of property and to initiate or be part of legal proceedings. It is also accorded immunities and privileges similar to those extended to diplomatic and international organizations of similar standing.

There is considerable awareness of the importance of developing ICT policies among the countries of the region. In an effort to create an enabling environment, most countries have developed or are developing comprehensive ICT policies. e-government and, to a lesser extent, e-commerce seem to have garnered the most commitment from governments of the region, no doubt because of the positive and immediate impact on efficiency of service delivery and revenue collection (see Table 7).

In Jamaica, a five-year Strategic Plan was developed as far back as 1998 (Ministry of Commerce and Technology, 1998). It drew on the National Development Plan, which identified the importance of technology as a tool for growth. In 2007, a revised national ICT strategic plan was developed under the leadership of the Mona School of Business on behalf of the Central Informational Technology Office (CITO) of the Government of Jamaica (Dunn and Duggan, 2007). The contents of this Strategic Plan have largely been adopted by the Planning Institute of Jamaica as the ICT component of a larger national Vision 2030 Plan for overall national development. A significant feature of this strategy is a call for a dominant emphasis on education, including media literacy. It also calls for substantially improved investments in R&D, integration of ICTs with Jamaica's cultural industries and wide sector consultations about governance issues. It also advocates dovetailing the plan with the government's Public Sector Modernization Programme's vision and strategy, with emphasis on benchmarking and monitoring progress.

At the regional level, the OECS has developed an ICT Policy and Strategic Plan and CARICOM has prepared an Agenda for Connectivity for its member states (see Table 7 for details on other countries). It must be noted, however, that the pace of policy making and limited implementation capacity have negatively impacted the rate of ICT development at both the national and regional

Table 7: Status of Enabling Environment for ICTs, Selected Caribbean Countries

Country	ICT Strategies and Policy	Institutional responsibility for ICT	Extent of Telecoms Liberalization	Telecomm Act
Barbados	August 2005: Draft of first integrated ICT Strategic Plan; Draft National Information Communication Technology Plan to be developed	Not centralized	Advanced	2001
Guyana	April 2006: ICT4D Guyana National Strategy Final Draft	Not centralized	Competition in mobile and Internet	1992
Haiti	Action Plan developed 2002 – to be adopted by government	Not centralized	Competition in mobile and Internet	2002
Jamaica	Five-Year Strategic Information Technology Plan; ICT also part of National Strategic Plan 2030	Not centralized	Full	2000
Bahamas	2003: Policy Statement on Electronic Commerce and the Bahamian Digital Agenda	Not centralized	Duopoly and monopoly	2009
Trinidad and Tobago	2003: National ICT Strategy fast forward	Centralized	Full	2003
OECS	Country guidelines developed	Centralized ECTEL, but with national regulators	Full	N/A
CARICOM	Connectivity agenda developed	N/A	N/A	N/A

Source: Adapted from Wilson (2008).

levels. Successes and constraints differ from country to country and vary both by industry and by initiative, depending on factors such as the quality of leadership, levels of education, availability of financial resources and level of political commitment.

Civil society and the private sector, however, provide a useful counterbalance to government-led policy regimes in the Caribbean. An increasing range of trade associations, intergovernmental institutions, professional groupings, regional units of multilateral organizations, university departments and other non-governmental organizations (NGOs) operate within the ICT policy domain. While many of these are themselves in need of on-going training and renewal, it is often these NGOs that help to achieve diversity, grass-roots legitimacy and sometimes consensus in ICT policy making and implementation within the region. This is particularly driven by the fact that one of the most potent uses for ICTs in the region is the development of cultural industries, in which the leading sector is not government but popular organizations or small, private enterprises. Businesses are expected to play a crucial role in ensuring the adoption of ICTs to ensure faster, cost-effective business processes and increased production levels, though the level of adoption of ICTs by businesses across the Caribbean remains low.

Key Issues and Challenges

The Caribbean communications industry is rapidly evolving, with increasing inward investment, growth of indigenous capital and entrepreneurship, and improvements in regulatory and policy institutions. Many challenges remain, some of which have increased and evolved to include issues relating to technology, regulation and cybercrime. Further, regulation remains fragmented. Challenges also relate to problems in the wider economy, demonstrating the systemic effect of sectoral issues. Thus, as ICT helped to drive growth and increase efficiencies in other sectors in Ireland, in many Caribbean states inefficiencies and lack of growth in the wider economy are having an adverse impact on the development and use of ICT.⁷

⁷ In 2006, Faltronic Company Limited was created in Jamaica to address concerns about computer security and protection and to offer cost-effective electronic security and control devices for buildings and vehicles, through both landlines and mobile phones. The company also is finding ways to expand its services beyond the security sector and into the tourism industry to offer pre-programmed tour information at specific attractions. The entrepreneur, conscious of the challenges facing present and future graduates of the University of the West Indies in an increasingly "tech-savvy" world, also aims to give students the opportunity to obtain business and technical experience at his company. Regulatory and other government-related inefficiencies have, however, hampered business start-up preventing the entrepreneur from committing fully to growing the business and have led to costly and time-consuming delays in securing inputs from overseas and clearing customs.

Technology

Communications media are now defined in terms of their technological forms, rather than by their content, with the Internet having the most influence on the character of the communications industry in the twenty-first century. The challenge to the region with respect to technology at both the infrastructure level and the end-user product is twofold: the slow rate of adoption of available technology and the high consumer cost of accessing the technology. While, as noted, the region has been quite successful in adopting mobile voice technologies, the adoption of more advanced business-oriented or educational technologies that are increasingly required to operate in the competitive global economy is advancing at a slower pace (Dunn, 2008).

A key challenge to the region is to increase the rate of adoption through the implementation of regional policies that facilitate the move from basic telecommunications services to more advanced Web 2.0 applications and other cutting-edge ICT technologies. Attendant to this development is the creation of an environment that enhances the access and affordability of these services. Not only does the high cost of broadband Internet access and international phone calls act as a deterrent to the adoption of new technologies, it also represents additional challenges to the region's businesses, with implications for their ability to connect with clients within the region, and more broadly, in the global marketplace. The Caribbean, therefore, has some way to go before terms such as the "death of distance" can be applied convincingly to it (see Cairncross, 1997; Burnham, 2003: 553–554).

With respect to infrastructure, which is a critical factor in the development of access to telecommunications services, the need is for investment to provide adequate bandwidth, with access to the international information superhighway at an affordable cost. Cost has also been identified as a major deterrent to the faster development and deployment of telecommunications infrastructure. Many of the major investments, however, have been by foreign firms such as Digicel, Claro, Orange and Verizon, while the cost of capital for indigenous firms to compete in providing telecommunications services at affordable prices continues to be prohibitive.⁸

⁸ In addition, indigenous firms often lack technical and management capability. Economies of scale are important given the small size of the market; therefore, those able to provide services in more than one market are those more likely to succeed.

Regulation and Competition

Newer technologies have also motivated governments to loosen controls over the communications industries. A major component of the successful development of a telecommunications sector is the existence of a legal and regulatory framework that provides certainty for investors, operators and other stakeholders.

It is widely recognized by policy makers and regulators that, in several countries, policy, legislative and regulatory frameworks suffer from fragmentation and inadequate flexibility. While there has been some progress, generally the enabling legislation and regulations within the region are not comprehensive and inadequate, and even where they exist they are often outdated. Where new regulations have been introduced, they sometimes have not been outlined in the context of integrated national ICT plans.⁹ Some countries have also adopted legislation in relation to e-commerce and e-government activities. This is a commendable start, but the ultimate goal remains a regional, harmonized approach to this issue, which, in turn, would guide the design of a regional policy and planning regime for e-government services.¹⁰

Perhaps one of the most important challenges facing the communications industry is the development of appropriate business plans — which tends to be costly, time consuming and thus a particular constraint on small businesses (even where they have the expertise to accomplish this task). The regulatory environment to address issues of management of intellectual property and business registration is also necessary.¹¹ Policy development has tended to be top-down with little input from the business community. At the same time, the region's businesses and entrepreneurs themselves have not always been willing to engage with governments, do not function as efficiently as their partners in other countries, sometimes lack the capital, capacity or desire to play a more proactive role in the economy and are not quick to adopt and use new technologies. This may require more interest and awareness of ICT and its

⁹ Jamaica and T&T are among the countries that have outlined comprehensive national ICT plans within the framework of broader national plans.

¹⁰ It is important to note that a harmonized approach does not necessarily equate to a "one-size fit all" strategy, particularly given the varying degrees of ICT development across the region. Indeed, such collaboration is in keeping with a stated desire to develop regional and complimentary approaches to national and regional problems.

¹¹ See footnote 8.

use as a business facilitation tool, and the provision of incentives toward this end. Private enterprise will need to better coordinate their inputs and response to ICTs and e-services and contribute to more innovative partnerships that extend to government and the voluntary sector in finding creative solutions to address these problems.

With liberalization across the region, competition issues have also come to the fore. As with other aspects of policy and legislation, however, there is fragmentation in this area. Competition legislation exists in Jamaica and Barbados, but the regulatory framework is deficient, as the telecommunications regulators have limited control over competition issues. In Jamaica, for example, there is often confusion concerning the powers of the Office of Utilities Regulation (OUR) and those of the Fair Trading Commission. Similarly, in Barbados, the Fair Trading Commission has limited regulatory powers in all areas of the industry. Thus, in the face of convergence of technologies and markets, competition issues will become one of the foremost concerns in ICT regulation, particularly in fledgling markets.

The cost of services such as high-speed Internet access also suggests insufficient levels of competition among players in the region, due in part to the persistence of monopolies and duopolies across the region. There is, therefore, a need for a specific brand of regulation or regulatory rationale that is informed by the segment of the market that is concerned. Thus, where competition is active, as in the mobile phone market, the goal may be regulation of competition, whereas, in underserved markets characterized by monopolies or duopolies, the aim may be regulation for competition.

Convergence

With technological convergence comes a myriad of other needs, including the convergence of institutions. There is also the need to develop the skills to operate within a technology-enabled environment. A key challenge to policy makers and regulators is that the pace of technological development and convergence far outpaces their capacity to respond. This is not peculiar to the Caribbean region, it affects regulators and policy makers in other settings as well. Nonetheless, this often leads to uncertainty — which has significant negative implications for the region's ability to attract investments in telecommunications. The challenge is to harmonize policy, legal and regulatory frameworks based on appropriate global best practices at both the national and regional level, as has occurred in the European

Union, and in Africa in the Economic Commission of West African States. Closer to home, the OECS, despite its many challenges, has made the effort to promote harmonization among its members through the formation of ECTEL. This institution, while underpinned by lower-level national regulatory structures, is the leading example of co-planning and harmonization of policies in the region's telecommunications ecology. Indeed, continuing discussions on the feasibility of an economic union between the OECS and T&T offer an opportunity for this form of collaboration to be extended to other Caribbean territories.

In addition to harmonization, the challenges of convergence will require trained human resources at all levels of the educational system, as well as investment in R&D. The development of the communications industry in the region requires a strong base of persons versed in the technical, policy, legal and regulatory domains of developing countries and capable of delivering quality communications services (see Dunn, 2007b). Several initiatives at the University of the West Indies and other regional institutions have started to address this important need.

Cybercrime

The growth of the Internet economy brings not only new opportunities, but also challenges in the form of the conduct of illicit activities, or "cybercrime," particularly for countries with an already limited law enforcement capacity. The task now is to encourage more positive use of the Internet as a business tool, and for regulators and law enforcement agencies in the region to track and reduce cybercrime.¹² Ultimately, the transnationality of the Internet and cybercrime will require Caribbean countries to seek inter- and intra-regional solutions (Minto, 2009b: 15).

Communications for Development: Grasping the Opportunities

The opportunities arising from the dynamic and rapidly growing ICT industry require the development of strategies, policies and institutions to manage the impact of the industry. These could be leveraged to enhance the

¹² The difficulties, however, are immense and have already been noted in countries outside the region. See, for example, Lemley and Lessig (2004); Benkler (2006); Hofmann (2007); Dutton and Peltu (2009); and Feick and Werle (2010).

Caribbean's competitiveness by moving toward high-level value-added products and services, an approach that would go some way toward levelling the playing field with the rest of the world. Among these steps should be to reduce red tape and increase support for young people wishing to start their own businesses in ICT and value-added services. This section outlines other areas that offer potential for the region, and highlights strategies for addressing some of the problems the paper has addressed.

Addressing Cost and Access

Three key factors have been identified as necessary to ensure successful transformation through the use of ICTs:

- *Access*: the capability of the region to use ICTs effectively;
- *Ability*: the capacity of the individuals and businesses to use ICTs in terms of the level of education and affordability; and
- *Benefit*: the value added from using ICTs, as well as the level of sustainable productivity, by identifying areas of differentiation and innovation through investments in R&D and the impact of ICTs on the quality of life (InfoDev, 2005).

These issues have emerged as important considerations throughout this paper, but addressing them may require the use of novel solutions and business models. Indeed, this may mean activating the potential of cross-sector arrangements involving government, business and NGOs to extend access to rural communities and to increase access points in urban areas. A model already exists for obtaining universal service in telecommunications, which offers the potential for extending access to other segments of the industry.

Broadband take-up has already been identified as an area poised for growth across the region; again, however, access to computers remains an issue. Realizing this potential may mean finding more diverse ways of accessing the Internet, perhaps via mobile phones, particularly given the high degree of mobile penetration rates across the region. Additional solutions are also possible: in the Dominican Republic, broadband access is being offered in rural communities via television sets, thereby reducing the need for computers (Business Monitor, 2009).

Increasing access to ICT, however, is not solely a matter of cost and accessing hardware. There remains the need for

more education, not only as it relates to the use and benefits of ICT and competition,¹³ but also to increases in basic literacy skills. While literacy rates remain comparatively high across the region, the quality of education in some cases is diminishing as more and more students graduate from school without the capacity to read or with underdeveloped cognitive skills. As such, the ability of the region's peoples to take advantage of ICT (even if access and cost were not problematic) requires equal attention to increasing literacy and the quality of education, with greater emphasis on science and technology (see Dunn and Duggan, 2007).

E-Commerce

The Internet has become commercialized as its value as a platform for conducting commercial activities and exchange (e-commerce) become increasingly apparent. There is, however, a need to normalize the idea of ICTs as tools for business, government and communities and not simply as means of entertainment. However, this also means finding ways of commercializing the entertainment aspect of the Internet, so that the Caribbean becomes a supplier rather than simply a consumer of such services.

Importantly, e-commerce offers an opportunity to overcome some of the barriers to small size and underdevelopment by increasing the scope to expand markets and trade relationships in ways that defy geography, small markets and the limited national jurisdictions and influence of such small developing island economies. Important here is the marketing of the islands and their products and services — not just tourism, but also regional cultural festivals and small businesses — to capture the young, web-savvy international audience looking for experiences beyond the ordinary sea and sand. Further, e-commerce has the capacity to reduce transactions costs for local, international and intraregional business operations, a plus in light of the high cost and difficulties of intraregional transportation. Thanks to the Internet, contact between customers and clients and service providers can be more frequent and less costly. Services such as real estate and groups such as the small business sector stand to benefit from a greater focus on e-commerce. Already, some of

13 This is an important consideration in a region that has not always experienced the benefits of competition and openness. A telling sign of this came in some of the smaller islands where public demonstrations were organized in 2001 against government plans to liberalize telecoms. These demonstrations hinted at the paternal role that Cable and Wireless (LIME) has played in the region, a role that has seen such large multinational institutions taking on significance and meaning (for example, a wider economic, political and social role) beyond the narrow mandate of their business obligations (see Minto, 2009a).

the region's economies have benefited from opportunities such as Internet gambling, with positive implications for employment and foreign exchange earnings.¹⁴

Importantly, the use of e-commerce in the conduct of modern-day governance in the region is all the more crucial as people seek better services and accountability from their governments. Thus, e-commerce as presented here is not analogous to government and its search for improved governance, but involves electronic transactions that assist in reducing bureaucracy, corruption and red tape. Governments throughout the region have begun to recognize such potential with increased customer satisfaction, improvements in service delivery and more diverse means of revenue collection,¹⁵ although the interface for such activities remains underdeveloped.

Beyond the gains to citizens at home are the benefits that should accrue to the diaspora population. This group, in some instances almost as large as that living in individual island territories, offers a large, accessible customer base for Caribbean businesses that are properly organized to take advantage of the opportunity to service it (Minto, 2009b). The Internet and, more relevant here, e-commerce on a governmental level may assist the diaspora to connect with and care for families at home more efficiently and at less cost. Services such as health care and medical supplies can be procured for elderly relatives, tuition and school supplies can be secured for children, customs fees can be paid online and even food supplies and other weekly household needs can be purchased directly online for families at home. Already, the move toward e-government has benefited members of the diaspora, who can now purchase government services online (for example, to obtain birth certificates or pay taxes) without travelling to the region, as is the case in Jamaica.

Mobile Banking

As an area for future consideration, mobile banking has the potential to aid and support the creation of new markets and business opportunities in the region as well as reduce the digital divide. Thus, according to Eric Duprat, general manager of Paypal's mobile business, while the "pain level to move money in developed countries is low...the pain level to move money in emerging countries is high,"

and this is also the case for small developing countries (Reuters, 2009). Additionally, this service could allow both recipients and the diaspora to lower costs associated with sending and collecting remittances that are the mainstay of many island economies (Minto, 2009b). Other risks associated with such transactions (for example, moving around large sums of money) could be mitigated or at least reduced, especially in settings where personal safety is an issue.

A number of challenges remain, however, before the full potential of mobile banking can be realized. The drive for new ways of doing business may not be strong enough across the region's banking institutions and businesses to encourage support for this industry. Additionally, while mobile services have been liberalized, constraints could emerge were individual banking institutions required to sign up to services from specific mobile providers, thereby limiting freedom and choice among consumers. This, of course, would require closer regulation to prevent unfair competition in both the banking and telecoms industries, which, in turn, may tax the existing regulatory capacity of individual islands. A high level of trust is also required between the banks and phone operators. There may also be unwillingness by each to cede control and ownership over their respective consumer bases. Finally, the profitability of this emerging area of the banking/mobile industry remains largely untested and requires further research.

Nonetheless, to the extent that access to and use of new technology is indicative of the region's level of connectedness to the information age and to the global economy, assessing the usefulness of such technology is important for the Caribbean. Further, where lack of access to such services may exacerbate the technology divide and widen levels of digital exclusion, even accepting that this is a result of and a contributor to other forms of divides (see, Tongia, Subrahmanian and Arunachalam, 2005: 29), then the development of this segment of the ICT and banking industries could prove beneficial for Caribbean territories in the long run. As the Irish model shows, preparedness cannot be underrated, and the region has to come to grips with new and emerging global trends in order to maximize its ability to anticipate and take advantage of such trends. This is important if Caribbean countries are to avoid being overrun by global challenges or caught playing catch-up a decade after an opportunity has come along.

14 See Cooper (2008) for a discussion of the Antigua case.

15 As an example of e-commerce and e-government initiatives in the region, Jamaica has implemented such programs in its Customs Department, the Inland Revenue Department and the Administrator General's Department of the Government.

Next-Generation Networks and Caribbean Global Marketing

The links among telecommunications, cultural expression and the Internet have created an increasingly attractive opportunity in the region's quest to reach global markets and allow its peoples to earn more. The move from the use of older analog technologies to state-of-the-art digital applications is being further enhanced by what are now being described as next-generation network services (NGNs). Technology-enabled services once delivered in vertical compartments or silos are now being delivered through horizontally linked and technology-enhanced applications.

The ability of these NGNs to better provide end users with integrated services combining voice, data, image and text is of great advantage to innovating societies seeking to market digitally products and services emanating from their creative imaginations. The traditional perception of telecommunications as simply communication lines, having a single functionality for enabling connections in other industries, has long given way to the wider notion of telecommunications as a value-laden industry, operating within newer, mainly service-based economies driven by information and cultural content. This suggests some prospect for the region to create an economy around its rich culture and history. The traditional constraints of global reach have been significantly bridged for many players, opening up the potential of expanded marketing in cultural products from around the world to connected consumers anywhere. This is a framework for intensified global competition in services, where product origin confers little special claim on global product marketing. Regional designations implied in such expressions "Made in Jamaica," "the steel pan," "reggae music" or "Blue Mountain coffee" can easily be attached to sub-standard or even equivalent items or expressions from a different origin and marketed globally, requiring greater investments in protecting intellectual and cultural property.

In an increasingly competitive global environment, the growing number of regional content providers and telecommunications operators and other ICT-related enterprises requires both support and certainty in their varying levels of investment. Coordinated policy making and joint negotiations with external players are essential if the desired transition to a new Caribbean service economy is to be successful. In the context of the putative Caribbean Single Market and Economy (CSME), such common policy approaches must be seen as important in seeking to integrate disparate strategies into common goals and shared

objectives. Freedom of movement of regional professionals as envisaged in the CSME is not enough (and even here, the extent of this "freedom" remains debatable). Caribbean telecoms and ICT policy makers must devise a regional strategic plan and policy framework covering issues such as online marketing, teleworking,¹⁶ network interconnection, spectrum management, numbering systems and common timelines for the pending switchover from analog to high-definition digital television. Coordinated numbering systems could be used to increase intra-regional trade and network access through simplified methods of dialling, as well as, more efficient use of time spent in placing calls to other countries.

Economics

Over the years CARIFORUM member countries have been involved in many of global, interregional, hemispheric and bilateral trade negotiations, some of which have provided the impetus for internal reform of the communications market. At the multilateral level, there has been the World Trade Organization (WTO) and the Doha Agenda.¹⁷ In terms of a regional approach, the CARICOM Connectivity Agenda and the CSME offer the opportunity for the region to take advantage of economies of scale in the expansion of the role of ICTs as a vehicle for economic development.¹⁸ However, taking advantage of the expansion and cooperation, implicit in agreements such as the CSME, again will require attention to the development of policies aimed at promoting competition and preventing market abuse.

At the interregional level, the CARIFORUM-European Union Economic Partnership Agreement (EPA) presents several prospects. Historically, Europe has not allowed access to some of its creative markets. Given the collapse of regimes for traditional commodities and financial markets, however, the support of locally produced music, fashion, design, film, television and other aspects of the region's cultural sectors can provide new avenues for sustainable growth and employment under the EPA

16 Teleworking refers to the use information technology and to replace work-related travel.

17 The WTO General Agreement on Trade in Services, as well as policies and practices in countries such as the United States and the United Kingdom have also played a significant role in the liberalization and growth of competition in telecommunications and the development of ICTs in many Caribbean countries (see Lodge and Stirton, 2002; Minto, 2009a).

18 The CARICOM Connectivity Agenda, adopted in 2003, sets out approaches to ICT development in the region based on infrastructure, utilization and content; see CARICOM (2009).

(see Nurse et al., 2007). The Caribbean Association of Industry and Commerce notes: “There is a significant range of service products on offer from the region and of export opportunities available, now heightened by provisions within the [EPA] with the Caribbean region. Unfortunately, the region’s service exports are not keeping pace with global growth. In many cases, significant export opportunities are still to be developed and in other areas, the region has only tapped into small niche markets” (CAIC, 2007: 3).

The EPA, however, can be considered a double-edged sword, as the level of e-readiness in the Caribbean (compared with Europe) limits their ability to take full advantage of the opportunities. As such, a number of issues need to be addressed, including the lack of local content, financing and incentives. A level of strategic planning with emphasis on improving institutional support and entrepreneurship and addressing the lack of knowledge and skills in the marketing of services is required in order to extract the potential benefits of the EPA.

Value-Added Outputs

Outsourcing and offshore businesses in the ICT sector is an area of vast growth and potential. Many countries in the region have already established a presence in this sector, serving the US market with call centres and with companies serving national and regional markets. Some countries, such as the Dominican Republic, have been more successful due to competitive wage rates and a fairly stable economic and political climate. However, opportunities still exist for the region as a whole to participate in knowledge-process outsourcing (KPO), particularly in the financial services industry and for some countries in software development. It may also be possible to attract FDI through joint ventures between established financial services companies and international call centres. As the Irish case illustrates, this may also mean concerted action between national planning bodies and local businesses (for example, providers of ICT services) in marketing and public relations campaigns aimed at exposing the region’s capabilities locally and internationally. Collaboration is again important in dispensing with destructive competition, which, rather than heightening competitiveness, can result in a regulatory race to the bottom among countries in the region.

Offshore data processing is already taking place in countries such as Jamaica, Barbados, the Dominican Republic and Grenada, but lower costs and more abundant supply of labour in countries such as China and

India mean that the region’s comparative advantages — in terms of being English-speaking, close to the United States and having a cheap, educated labour supply — are dwindling.¹⁹ The imperative, therefore, is to shift emphasis to high-end skills and services in ICT, a path that requires even more focus on the quality of ICT education and training in the region.

Some areas of value-added ICT activities that have been identified for the region include:

- Key data entry for magazine subscriptions, coupons and other simple tasks;
- Manuscript conversion from paper or voice to electronic files;
- Corrections and repairs in highly automated systems such as airline ticket revenue accounting;
- Information entry and judgement for health care claims processing;
- Conversion of databases from old file formats to newer, easier-to-use systems;
- Providing voice-oriented and computer-supported call centre operations for technical help desks or customer services;
- Telemarketing, both inbound and outbound, for efficient sales and order entry processes;
- Processing and analysis of market research data;
- Computer-aided design services for engineering operations;
- Geographic information services for mapping;
- Document storage and management;
- Co-location, networking, web development, web hosting, computer graphics and animation;
- Software program conversion for changes in large system computer platforms and software development for a wide range of applications, some in support of the local informatics industry and others for use by unrelated customers (Caribbean Regional Negotiating Machinery, 2007);
- Innovative ICT-based security solutions; and
- The use of ICTs in disaster preparedness and response strategies.

¹⁹ For an assessment of some of the threats to the region’s ability to compete in value-added services, see Erikson and Lawrence (2008).

Conclusion

The CARIFORUM region must position itself to take advantage of the unique characteristics inherent in ICT to transform their economies into knowledge-based societies capable of competing globally. To this end, a strategic focus on issues such as policy, infrastructure, enterprise/entrepreneurship, human capacity, content and applications is required. Moreover, the region must seek to address key developmental issues quickly. To this end, we offer the following recommendations:

- 1) Further liberalization of the ICT sector and comprehensive efforts to provide ubiquitous infrastructure access to key economic sectors.
- 2) Macroeconomic policies to promote investment in ICT-intensive sectors, including fiscal, monetary and trade policies to ease access to financing and to reduce the tax burden on suppliers and consumers.
- 3) The creation of a cadre of knowledge workers and entrepreneurs through improvements in basic literacy and ICT literacy. This would necessitate a revision of regional educational curricula to make learning more attuned to the global demands of an intensifying information society while retaining indigenous cultural values.
- 4) A strengthening of institutional and corporate capacity for R&D in ICT and related value-added activities.
- 5) More effort to capture the region's competitive advantages through providing sustainable linkages between ICTs and creative industries. This would also involve reform of the policy and regulatory framework with respect, for example, to e-commerce, intellectual property and cyber security.
- 6) The promotion of facilities for access to credit and financing through the development of a more vibrant venture capital sector. This may not necessarily mean the creation of new institutions, but simply offering more support to existing institutions.
- 7) The creation of regional support institutions and systems for business start-ups in ICT. These would provide sustained and focused assistance to small entrepreneurs to build and sustain their enterprises. Such institutions should identify and provide targeted support to overcome impediments to businesses generally. Such a scheme would be significant given the present reality in which locally owned ICT services providers tend to be small, have little capacity to conduct (or commission) R&D and have little room or support to compete vis-à-vis large, foreign-owned companies that currently dominate the regional market.
- 8) The need for governments to lead by example as major consumers of ICT products and services and through the implementation of appropriate best practices using ICTs.
- 9) The creation of partnerships among civil society, the private sector and government to foster common strategic visions and collaborative actions. Effective partnerships, already underway, need to be scaled up to become the norm, rather than exceptions.
- 10) The development of more collaboration among government departments (that is, intra-sectoral) to obtain improved consistency in the design and implementation process, to achieve more harmony across departmental agendas and to make the best use of limited capacity and resources.

While the Caribbean seeks to address these challenges and to learn from others in the quest to build knowledge-based societies, it should be noted that strategies for the use of ICT are not universal. Even within the region itself, countries face different circumstances, priorities and financial means, and will adopt different strategies based on their perceived priorities. Nevertheless, if economies of scale are to be achieved for the small island developing states of CARIFORUM, a framework for action built on consensus and a process for addressing barriers in the different areas through advocacy, consultation and incentives will be necessary.

As illustrated in cases such as Ireland, Costa Rica and Australia, ICT policies and initiatives that are properly conceived and implemented can have far-reaching impacts. These models and lessons can be scaled nationally and regionally, thereby contributing to real change and fuelling the drive for development. This is not a one-off process. The future of the communications industry will continue to be shaped by newly emerging technological innovations, requisite adjustments in regulatory policy and the continued growth in demand for information goods and services. While the structural characteristics of the industry may change, it is clear that its importance to economic and social development will continue to grow.

In the end, the focus should not be on ICT in and of itself, but on understanding and accepting the industry as a tool for helping the region to improve the delivery of services, increase wealth, reduce distance and costs and advance governance and democracy. The goal is for such gains to have a direct impact on the economic and social well-being of people and businesses in the region, and ultimately on its economic and development prospects. Reaching such goals will require

strategic thinking on the part of governments, businesses and the wider society that surpasses the opportunism that had accompanied the growth in ICT in the late 1990s to that is more focused, engineered and mindful of the “on-the-ground” needs and strategic directions of the countries of the region.

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