



Central Information Technology Office

NATIONAL ICT STRATEGY CONTEXT AND BACKGROUND

Supporting Document
to the
***E-Powering
Jamaica
2012***
NICT Strategy

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Acronyms and Abbreviations

ABIS	Agri-Business Information System
B2B	Business to Business
CAPE	Caribbean Advanced Proficiency Examinations
CARICOM	Caribbean Community
CITO	Central Information Technology Office
COTS	Commercial Off the Shelf
CPTC	Creative Production and Training Centre
CTU	Caribbean Telecommunications Union
CXC	Caribbean Examination Council
DOI	Digital Opportunity Index
DRM	Disaster Risk Management
EIU	Economic Intelligence Unit
ERMS	Electronic Records Management System
ESSJ	Economic and Social Survey of Jamaica
ETRC	Education Technology Resource Centre
ETT	Education Transformation Team
G2B	Government to Business
G2C	Government to Citizen
G2G	Government to Government
GDP	Gross Domestic Product
GIS	Geographic Information System
GISSEP	Geographic Information Systems in Schools Education Programme
GOJ	Government of Jamaica
GPS	Global Positioning System
GSS	Group Support Systems
HEART / NTA	Human Employment and Resource Training / National Training Agencies
ICD	Information and Communication for Development Survey
ICT	Information Communication Technology
ICT4D	Information Communication Technology for Development
IDB	Inter-American Development Bank
IMF	International Monetary Fund
IS	Information Systems
IT	Information Technology
ITU	International Telecommunications Union
JASPEV	Jamaica Social Policy Evaluation Project
JBTE	Joint Board of Teacher Education

JCF	Jamaica Constabulary Force
JFLL	Jamaica Foundation for Life-long Learning
JSDNP	Jamaica Sustainable Development Networking Programme
JTB	Jamaica Tourist Board
MDGs	Millennium Development Goals
LMIS	Labour Market Information System
MIS	Management Information Systems
MITEC	Ministry of Industry, Technology, Energy and Commerce
NGO	Non-Government Organisation
NHP	New Horizon for Primary Schools Project
NIR	Net International Reserves
NRI	Networked Readiness Index
NWA	National Works Agency
NYS	National Youth Service
ODPEM	Office of Disaster Preparedness and Emergency Management
OSS	Open Source Software
PESP	Primary Education Support Project
PIOJ	Planning Institute of Jamaica
PSRU	Public Sector Reform Unit, Cabinet Office
SESP	Social and Economic Support Programme
SIDS	Small Island Developing States
SMEs	Small and Medium Enterprises
SSEP	Secondary School Enhancement Programme
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECLAC	United Nations Economic Commission for Latin America and the Caribbean
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNPAN	United Nations Online Network in Public Administration and Finance
USAID	United States Agency for International Development
UTech	University of Technology
UWI	University of the West Indies
WSIS	World Summit on the Information Society
WTO	World Trade Organization

I. THE GLOBAL AND REGIONAL CONTEXT

1. Contextual Overview

The world's advances in ICTs over the past 20 years have been phenomenal. The use of ICTs has become so pervasive that teenagers cannot fathom a world without mobile phones and computers. A candid examination of our daily lives illustrates ICTs' impact on how we communicate, work, learn and shop. Today's information age necessitates "on-the-go" information which places emphasis on portable digital ICT devices in a wireless communication environment. As a result, the digital age has brought about remarkable transitions such as the World Wide Web, high-speed broadband internet and universal increase in use of small mobile devices to communicate and collect information ubiquitously. Undoubtedly, ICTs have facilitated global development through connecting people and will play a vital role in the future.

ICTs have gained increased importance especially with the advent of globalization and increased information-intensive economic activity (World Bank 2006). Consequently both Private and Public Sector acknowledge ICTs' pivotal role in national development as ICT use enhances Public Sector effectiveness, efficiency, and transparency as well as creates substantially higher profits for firms.

While there have been rapid advances in ICTs, the degree of advancement has not been evenly distributed across the globe. There exists a digital divide as the penetration of high-end technology is often restricted to more advanced countries. As such the global community, through the World Summit on the Information Society (WSIS), has sought to address the key issue of decreasing the digital divide while increasing pervasive communications and exploring the potential of ICTs in achieving the Goals of the United Nations Millennium Declaration. The World Summit which took place in December 2003 in Geneva and in Tunis in November 2005 resulted in a common vision and agenda of ICTs to achieve the national development strategies and more broadly the United Nations Millennium Development Goals (MDGs).

2. Global Imperatives

In updating the National ICT Strategy, certain global imperatives must be considered. The first is the World Summit on the Information Society Declaration of Principles (2003). In this document countries involved in the WSIS, including Jamaica, affirmed a commitment to building a:

“people-centred, inclusive and development oriented Information Society, where everyone can create, access, utilize and share information and knowledge, enabling individuals, communities and peoples to achieve their full potential in promoting their sustainable development and improving their quality of life.”

The main goal is inclusiveness and access to information and knowledge which, in turn will be the goal of this strategy. This goal will be attained through the leveraging of ICTs to promote

the Millennium Development Goals while recognizing that ICTs are tools towards human progress and not ends in themselves.

The United Nations Millennium Declaration (2000), another global imperative that must inform our National ICT Strategy, puts forward eight Millennium Development Goals (MDGs). The specific goals which will inform the strategy are:

- Achieve universal primary education, and
- Develop a global partnership for development.

Additionally, the strategy will speak to the overall commitment of the MDGs towards human and social development because it is felt that through the development of the ICT sector, through education and through access to ICTs there will be a significant improvement in the quality of life of Jamaicans.

As it relates to the region, UNECLAC has made one of its focuses the e-Readiness of Latin America and the Caribbean. In their publication, 'Evaluation of e-Readiness Indices in Latin America and the Caribbean', there is an in-depth analysis of each country in the region and their status in terms of e-Readiness according to the indicators. Jamaica's strong points are its ICT infrastructure, and its business and policy environment, however connectivity, incentives and innovation are considered its weakest area. These are areas for consideration in the Update and Revision of the National ICT Strategy.

3. Overview of Trends

One development has been the liberalization of the telecommunications market. Though the degrees of liberalization have not been uniform, the opening of the telecommunications markets have facilitated lower access costs, greater resilience as well as increased competitiveness in the countries which embarked in the road of liberalization. Another overwhelming trend is the growth of mobile phone telephone lines which now surpass fixed ones according to the World Bank's Information and Communication for Development (ICD) (2006). This trend is indicative of the substitution of fixed lines due to scarcity of fixed lines to some rural areas as well as the increased mobility achieved through mobile phone usage.

In examining the global trends the project team studied the ICT Plans of nine other countries which act as a benchmark for the Jamaican NICT Strategy. These countries are Barbados, Trinidad and Tobago, Canada, New Zealand, Ireland, Singapore, Malaysia, Chile and Ghana. These countries were chosen given their correlation with Jamaica in size, economic structure as well as the stage of development of their National ICT Strategy. The trends emanating from the country studies highlight the importance of the quality and availability of physical infrastructure as well as adequate human development to exploit the opportunities offered by pervasive ICT use. More specifically, trends emphasize a digitally literate and ICT savvy population as being one of the critical components of an ICT strategy. This is evident in the countries which are at the budding stages of development such as Barbados, Trinidad and Tobago and also with the more ICT-advanced Canada. This point is confirmed by the World Bank's ICD survey of policy makers who emphasized connecting schools to ICTs as the top

international priority, followed by connecting scientific and research centres.

Since ICTs are seen as tools to achieve the national goals rather than as outcomes in themselves, the national plans studied have highlighted methods through which ICTs can assist in increasing the productivity of both Public and Private Sectors. The areas to achieve the envisioned increase in productivity in the Private Sector *inter alia* are: building e-commerce; interlinking sectors and; developing and funding Small and Medium Enterprises (SMEs). Similarly the key areas in increasing Public Sector productivity include: facilitating interconnection of government entities, reducing bureaucracy through more efficient record-keeping and information dissemination.

Furthermore, the infrastructure trend arising out of the country studies places emphasis on a broadband strategy as there is a global appreciation for the notion of universal accessibility to a nation-wide network. The views echoed throughout the country studies also promote not only the implementation of broadband infrastructure but also speak to its affordability. A method which has achieved success from the country studies is the use of competitive bidding to award subsidies to ICT providers (World Bank, 2006). There also exist suggestions of mobilizing public resources to establish sustainable markets for the private provision of the desired services as well as the aggregation of demand for connectivity among public agencies, schools and hospitals to increase access to ICT services.

4. Insights Gained

Several important insights have been gleaned from the study of ICT development in the countries in our benchmarking sample. The most important underscores the many potential hurdles to the realization of the full potential of ICTs in both developed and developing countries (e.g., underdevelopment of the human capital, inadequate infrastructure, general and computer illiteracy, insufficient Internet access, and legislative and regulatory inactivity). In several of the studies, the development of effective ICT policies across a wide range of domains was seen as a critical success factor to promote capacity building of infrastructure, competencies, and knowledge to ensure diffusion and use. Another insight gained is that the achievement of strategic objectives vary according to the income level of the countries studied, therefore, attention must be paid to economic feasibility.

4.1. Best Practices

In the country studies, it was found that governments led the charge in creating a knowledge society. The governments in the countries studied have taken the lead role as the social benefits to be gained far outweigh the costs that will be incurred. Another best practice emanating from the country studies is the provision of universal access through development of ICT centres in communities to bridge the digital divide and to ensure penetration in rural areas. These areas are often excluded from such developments due to the unattractiveness of the returns to private investors. Those countries that have incorporated ICT diffusion plans in their national development plan have been successful in gaining greater buy-in from all sectors. Another useful practice is the forging of strategic alliances with countries which are technologically advanced.

4.2. Emerging Issues

Key emerging issues from the analysis of the country studies are:

- The use of content as a means of promoting the country's brand and national identity. Content is deemed important to ensure accessibility of national information.
- The need for revision of the policy and legislative framework to include provisions for the security of electronic transactions, to constrain other e-crimes and to protect intellectual property.
- The use of ICTs in disaster preparedness.
- The shortcomings in implementation and follow-through in national ICT plans. The ICD highlights weak policy and implementation capacity as well as lack of political will as major contributors to implementation failures. As a result, government should oversee plans for monitoring and evaluation of the strategy.

II. THE LOCAL CONTEXT

National Priorities

Among the objectives to be pursued in developing and implementing the National ICT Strategy are key national priorities identified from the consultations as crucial to the success of the strategy. These priorities, set out in Figure 1 below.

Figure 1: National Priorities	
❖ National Security and Cyber Crimes	❖ Transformations: Sunrise / Sunset Industries
❖ Relevant Education and Training	❖ Law and Policy as facilitators to ICT development
❖ Content Creation and Intellectual Property	❖ Vulnerabilities and Risk Management
❖ Diaspora Involvement	❖ Ongoing Monitoring and Evaluation
❖ Caribbean Single Market and Economy	❖ Archiving and Document Management
Source: NICT Stakeholder interviews and consultations	

These areas were identified as key caveats to enable the country to maximize the use of information and knowledge as a catalyst for growth and economic development. The areas include the establishment of digital repositories of archival data and information to increase its availability and accessibility and accommodate data sharing; the development of intellectual property rights protection, access to information and consumer protection in keeping with the global legislative activities which use law and policy as facilitators to ICT development.

The development of a reliable disaster recovery mechanism which would act as a national ICT Disaster Risk Management (DRM) to quantify the impact of vulnerabilities on the ICT diffusion process to inform national public policy and pre-disaster initiatives and planning was also identified as being critical.

Additionally, building infrastructural capacity was underscored as necessary to improve Jamaica's global competitiveness through transformation of sunset industries where applicable, as well as maximizing the opportunities emerging from sunrise industries. Also, the pervasiveness of ICTs in organizations and businesses especially Small and Medium Enterprises (SMEs) was highlighted as integral towards harnessing the competitiveness of domestic firms within the CSME as well as the global marketplace.

Moreover, while all identified priorities are considered areas which need to be addressed to ensure fruitful integration of ICTs in the Jamaican economy, most correspondence reiterated the importance of the provision and availability of relevant education and training.

Another acknowledged priority is that the strategy should also include input from and assistance by members of the Jamaican Diaspora in implementing priority initiatives under the NICT Strategy through mutually beneficial partnerships.

1. Contextual Overview

Jamaica has been a culturally dynamic island of the Caribbean from the colonial era. With a population of 2,650,900 people (PIOJ 2006), it has a rich cultural heritage and is a world renowned brand name. The Jamaican society is ranked 98th on the Human Development Index 2003 which is indicative of medium levels of human development (UNDP 2005). The Economist Intelligence Unit's World-Wide Quality of Life Index (2005) places Jamaica in the 64th position which is an improvement by 20 places upon Jamaica's previous ranking. Over the past decade there has been a notable improvement of some socio-economic indicators, including a sharp reduction of poverty which is paradoxical with the existing low economic growth. Though the IMF recognizes the possibility of the underestimation of official growth rates due to the increase in size of the informal economy, the reduction of poverty can also be attributed to Jamaica's labour force consisting of the "working poor". King (2005) attributes the reduction in poverty levels as a result of the consistently low and falling inflation rates of the late 1990s which have resulted in an increase in the real wages of the poor which constitute the majority of the labour force. In essence, while there was no significant increase in nominal wages, real wages rose causing a redistribution effect which is reflected in the reduction of poverty. The Jamaican society has undergone a number of adverse economic situations and experienced a few economic shocks over the past decade and a half.

Economy

The Jamaican economy is faced with the ills of a burdensome debt overhang which limits the effect and flexibility of both fiscal and monetary policy. Additionally, in recent years Jamaica has demonstrated susceptibility to shocks which have adversely affected its economic performance and exposed vulnerabilities within the economy. Growth in the last decade has been virtually negligible and described as "a decade of virtual stagnation" (IMF, 2004). In contrast, the level of unemployment has been reduced from 16.5% in 1997 to 11.7% in 2004. With a relatively stable exchange rate and an increasing level of Net International Reserves (NIR), Jamaica seems poised to return to increased economic growth and single digit inflation barring further adverse shocks; however, it is worth noting that the political cycles also pose risks to the economic outlook given imminent elections (IMF 2006).

The major sectors which contributed to Jamaica's GDP over the last decade are the distributive trade sector, the manufacturing sector and the transport, storage and communication sector with an average contribution of approximately 22.33%, 14.53% and 11.96% respectively. Major employment in Jamaica is concentrated in the manufacturing sector with the sectors of trade, hotels and restaurants and the financial sector being the second and third major areas of employment respectively. As at July 2005 Jamaica's labour force stood at 1,197,500 persons

which represented 45.1 percent of the population. Males held a labour participation rate of 72.9 percent in 2005 while the corresponding female rate was 55.4 percent (PIOJ 2005).

Ultimately, to stimulate economic growth, Jamaica must use its limited resources efficiently. The implementation of ICT in the general policy framework will be a prudent step toward achieving this objective. Given Jamaica's traditional dependence on sunset industries, such as sugar, ICT development may not only provide a sunrise industry but may also improve existing infrastructure to increase productivity in some sunset industries. Furthermore, in order to fulfil the envisaged growth especially through ICT there needs to be "a systematic and sustained programme of training to lift the 'quality' of the labour force in Jamaica"¹.

Communications

With the liberalization of the telecommunications market in 2001 Jamaica has developed a world class digital telecommunication system. The granting of licences to Digicel and Oceanic Digital have allowed for a more competitive market with lower call charges and more advanced mobile technology. More recent developments include the introduction of a new broadband network, Flow Jamaica's fibre optic cable network, and Digicel's acquisition of a licence to offer WiMAX services.

According to the World Telecommunication Indicators (ITU 2005), Jamaica has 18.7 main telephone lines per 100 inhabitants, 82.2 mobile cellular telephone subscribers per 100 inhabitants and 39.9 internet users per 100 inhabitants. The Digital Access Index (ITU 2003) ranks Jamaica 54th of 178 countries.

2. Capability Analysis

Jamaica has earned mixed reviews regarding the capability of its ICT infrastructure, e-readiness, and the development of the human capital to translate ICT acquisitions into effective applications for enhancing ICT knowledge and effective use by individuals, the public sector, and private institutions.

It is commonly acknowledged that Jamaica has done a more than credible job in expanding its communications infrastructure, deregulating the ICT sector and encouraging competition in the sector. The government has demonstrated its commitment to ICT and genuine attempts have been made to develop the human capital through technical training and improve competency in software development. However, there is still a dearth of information systems education (as distinct from computer science) at the tertiary level to address the behavioural issues of IT applications in business organizations.

E-Government Services

The increasing pressure and demand from the citizens of Jamaica who have been exposed to e-government services, both locally and overseas is creating an environment for new and exciting developments, as the supply side of the value-chain—the government of the land—has

¹ Address to the Jamaica Employers' Federation. Launch of the 2006 Salary Survey at JEF Conference Room by Dr. Omar Davies, MP on September 7, 2006

been, and is continuing to make significant strides to improve service delivery to its stakeholders.

Jamaica leads the English speaking Caribbean in terms of its deployment of successful e-government services. This statement is supported by our number one ranking in the region in the UN's Global E-Government Rankings for the past three years.

Our operationalised e-government initiatives include:

- Jamaica Customs
- Inland Revenue Tax Payment
- Office of the Registrar of Companies (ORC)
- National Land Agency e-Land (NLA)
- Registrar General's Department (RGD)
- Management Institute for National Development (MIND)
- Jamaica Tradepoint e-Trade Facilitation Services

The Jamaica Customs e-Payment system launched July 2003, facilitates online import duty payments by brokers and importers, and checking of entry status; speeding up processing time for import transactions and improving the efficiency of tax administration and ease of compliance with tax requirements. The Jamaica Customs system is processing online import transactions at the rate of over 5,000 per week and e-payment of import duties up to J\$5 million per transaction. The deployment of this e-government service has resulted in radical efficiency gains. Turnaround time for processing a C-78 entry used to be an average of seven to eight (7 – 8) days before Jamaica Customs went online. Now, they can do it in two (2) hours! Ease of compliance due to a vastly improved service, and increased detection of under-valued goods or contra-band through an electronic cargo tracking intelligence system (embedded in the Customs e-government implementation) have resulted in revenue increases of over 200% for the Customs Department, since the e-payment system was launched two years ago. This service has been adopted by over 70% of the stakeholders who do regular business with the Customs Department.

It is important to note that the key to success of the Customs e-payment service is not in the technology itself, but rather in the major overhaul of the organizational structure and business processes of the Customs department—a long and difficult process which laid the platform for today's accomplishments. This service-oriented reformation that yielded a vastly improved organization and workforce, in terms of its efficiency and effectiveness in carrying out its mandate, laid the foundation for the deployment of the highly successful Customs e-government service, which has set the standard for other government entities to pursue.

The Inland Revenue Tax Payment Portal launched December 2004, makes possible the payment of twelve (12) simple taxes online that effectively need only the TRN (Tax Payer Registration Number) and payment amount in order to successfully process the transaction. The tax types available for e-payment include land tax, traffic tickets, and vehicle fitness certificate fee. The demand for the service is steadily growing. Over 2,000 registrations have occurred in the first six months of deployment.

The Office of the Registrar of Companies' e-government service launched 2002/03 fiscal year, offers subscriber based online access to forms for registration of business related information and payment of fees. Online transactions are being conducted at a rate of 1000 per month. The types of activities that can now be handled online include registration or reservation of business names, particulars of directors, searches for registered addresses and images of all company related documents. To date some 1400 subscribers have signed on to the system. As a direct result of the deployment of this e-government service the ORC has also realized significant gains in turnaround time of its services.

The National Land Agency also deployed a subscriber based e-government service called **e-Land Jamaica** in September 2003. This facility allows users to view and print documents such as certificates of title, and strata and deposit plans. The experience at NLA is not unlike that at Customs. There were significant organizational structure, human resource development and business process re-engineering challenges to overcome before the successful deployment of e-Land Jamaica could be achieved. The NLA, like Customs, found that the fear of job losses due to the implementation of these IT projects was unfounded. What became required was the re-training and re-purposing of staff to carry out new functions in organizations that were now delivering a higher paradigm of service.

Other e-government services that have been deployed in Jamaica include those of the Registrar General's Department (RGD) and the Management Institute for National Development (MIND). **RGD's e-government service** allows online applications for various certificates, including those for births, deaths, and marriages. **MIND's e-learning offerings**, which were launched November 2003, deliver a fully online degree programme containing 18 course modules, with over 60 students enrolled. Through this facility, MIND can offer the same course to a student half across the Caribbean or the world, as easily it can offer it to a student sitting in a classroom at its Kingston, Jamaica headquarters.

Jamaica Tradeport E-Trade Facilitation Services, though not yet fully integrated (in terms of the connectivity between all the agencies that may be involved in a particular trade transaction) is well advanced in its implementation. Key components of trade facilitation services that have already been deployed include jExporter, Jamaica Trade & Invest (Jamaica's Promotion and Investment Agency) online exporter registration system, and the Trade Board Information System (TBIS) which handles licensing and certification for specific import or export products.,

Other areas under development involve online GCT (General Consumption Tax) and income tax filing which require new legislation to support e-transactions and electronic signatures. An e-learning programme for high schools was recently launched through the formation of E-Learning Jamaica Ltd., a joint initiative of the Ministries of Commerce, Science and Technology; and Education, Youth and Culture. This project aims to deliver grades 7-11 curriculum material and tutorial sessions to students across the island via various electronic media, such as the Internet and cable television network. The project will begin with a pilot of 20 schools over the first few years, before, being expanded to cover all secondary schools in Jamaica, which currently number 150.

Another major area under development lies within the health sector. The Regional Health Authorities are building high bandwidth, high speed networks and systems to support island-wide access to a Health Information System (HIS) which will include, among other things, online immunization registration and tracking, health lab results information management, integrated data and voice communications and wide-area video conferencing.

E-Commerce/E-Business

The Private Sector has also established its own IT committee to leverage its accumulated knowledge and foster cross-fertilization of ideas. The financial services industry has lead the way with e-services offerings. There are also e-commerce offerings from several retailers, and tourism interests. However, e-commerce overall is still in its infancy and there is no needs to be an increase in e-commerce start-up operations.

Legislative/Policy Environment

Legislative activities in the areas of telecommunications market liberalization, intellectual property rights protection, access to information and consumer protection have provided some support for ICT capacity building. The new telecommunications policy will provide important new reform to the legislative and policy landscape, including the formation of a single telecommunications regulator. Jamaica has enacted the legislation to govern electronic transactions, and is in the process of developing accompanying legislation to combat cyber-crimes and provide effective data protection. However, the evidence act is need of significant update to make provision for the admission of electronic documents for evidence in the Jamaican Judiciary.

ICT Benchmarking

While Jamaica continues to score progressively higher in various digital readiness rankings, ICT deployment and usage is still curtailed by a combination of factors including limited access to affordable hardware; the high rate of illiteracy and, in some cases, ineffective use of the English language, the dominant language of IT; the continued depletion of IT skills attributable to migration; low skill levels and technology anxiety among the older population; and high unemployment rates. There is still a large internal digital divide.

2.1. ICT Architecture

There is ample evidence of improved capability in ICT infrastructure in the telecommunications sub-sector. There is a steady growth in bandwidth capacity, measured increase in fixed telephone lines, and phenomenal penetration of mobile telephones and growing multiplicity of options, both wired and wireless broadband. Requisite network operations and management skills are also quite common.

However, the following problems need urgent attention:

- There is not a significant basis for the creativity and innovation in the ICT sector because of (1) the lack of capability in the manufacturing of ICT hardware components and (2) the

dearth of native information systems development; Commercial off the shelf (COTS) software acquisition is the dominant method for sourcing software.

- e-Commerce activity is concentrated in product and service delivery to consumers; not much attention is paid to B2B operations, brokerage/intermediary services, shopping malls, virtual communities, content and service provision. E-commerce providers do not exploit the full spectrum of revenue streams such as advertising, subscriptions, website hosting and web storage. B2B offerings are virtually non-existent.
- Although information technology tools exist to accommodate storage, retrieval and presentation, much of our archival records remain either in non-digital formats or as islands of automation. Electronic document management systems are not now available to establish digital repositories of archival data and information to increase availability and accessibility and accommodate data sharing.
- Groupware, for supporting collaborative efforts among, and coordinating the work of virtual teams, is non-existent.
- Formal knowledge management technologies and processes are not well understood or adopted.
- Business intelligence through data warehousing and data mining is merely a concept taught in graduate programs
- Many of the innovative organizational arrangements enabled by IT that supports disintermediation, virtual corporations and Telework are not prominent.
- Environmental scanning to establish what emerging technologies may be gainfully incorporated in the ICT infrastructure hardly occurs either in the Private or Public Sector
- There are very few Application Service Providers to reduce the burden of technology self-service for SMEs
- Content management systems for maintaining the currency of web sites are not well used

2.2. Digital Readiness

The digital readiness of a country is determined by several components including infrastructure availability and access, levels of computer and internet usage, the enabling environment and the preparedness of a country to participate in the global networked economy and benefit from ICT developments.

2.2.1. For Global Competitiveness - External Focus

Several indices have been developed to assess and measure components of a country's digital readiness in the global context. These instruments, though used across the board for several

countries, may not always accurately and completely reflect the specific situation in a particular country. However, in June 2004, the Partnership on Measuring ICT for Development was initiated with the aim of agreeing on and establishing a set of common core indicators.

In the global rankings, Jamaica has tended to be ranked about midway in the world. Table 1 presents a summary of these rankings and indicators based on several global studies.

Table 1. Jamaica's Scores in Some Global Rankings

Name of Index	Year	Jamaica's rank	Jamaica's score	Produced by	Indicators
E-readiness ranking	2006	43	5.03 (out of 10)	EIU	Connectivity Business environment Consumer and business adoption Legal and policy environment Social and cultural environment Supporting e-services
Networked Readiness Index	2005	54	-0.11	World Economic Forum	ICT environment Readiness Usage of ICT
Digital Opportunity Index	2005	52	0.47	ITU	Opportunity Infrastructure Utilization
ICT Diffusion Index	2004	57	0.421	UNCTAD	Access Connectivity
E-government readiness ranking	2003	61	0.432	UNPAN	Web measure Telecom Index Human capital Index

The E-readiness ranking produced by the Economic Intelligence Unit (EIU) aims to provide a country with an assessment of its status in terms of connectivity, and its ICT environment in relation to other countries. Jamaica's 2006 rank is 43 with a score of 5.03. This score is higher than the 2005 score of 4.82, although the rank has fallen due to the inclusion of two new countries ahead of Jamaica. In the components of the scale, connectivity obtains the lowest score, while business, legal and policy environments obtain the highest scores in the Jamaican context.

The World Economic Forum defines the Networked Readiness Index (NRI) as 'the degree of preparedness of a nation or community to participate in and benefit from ICT developments'.

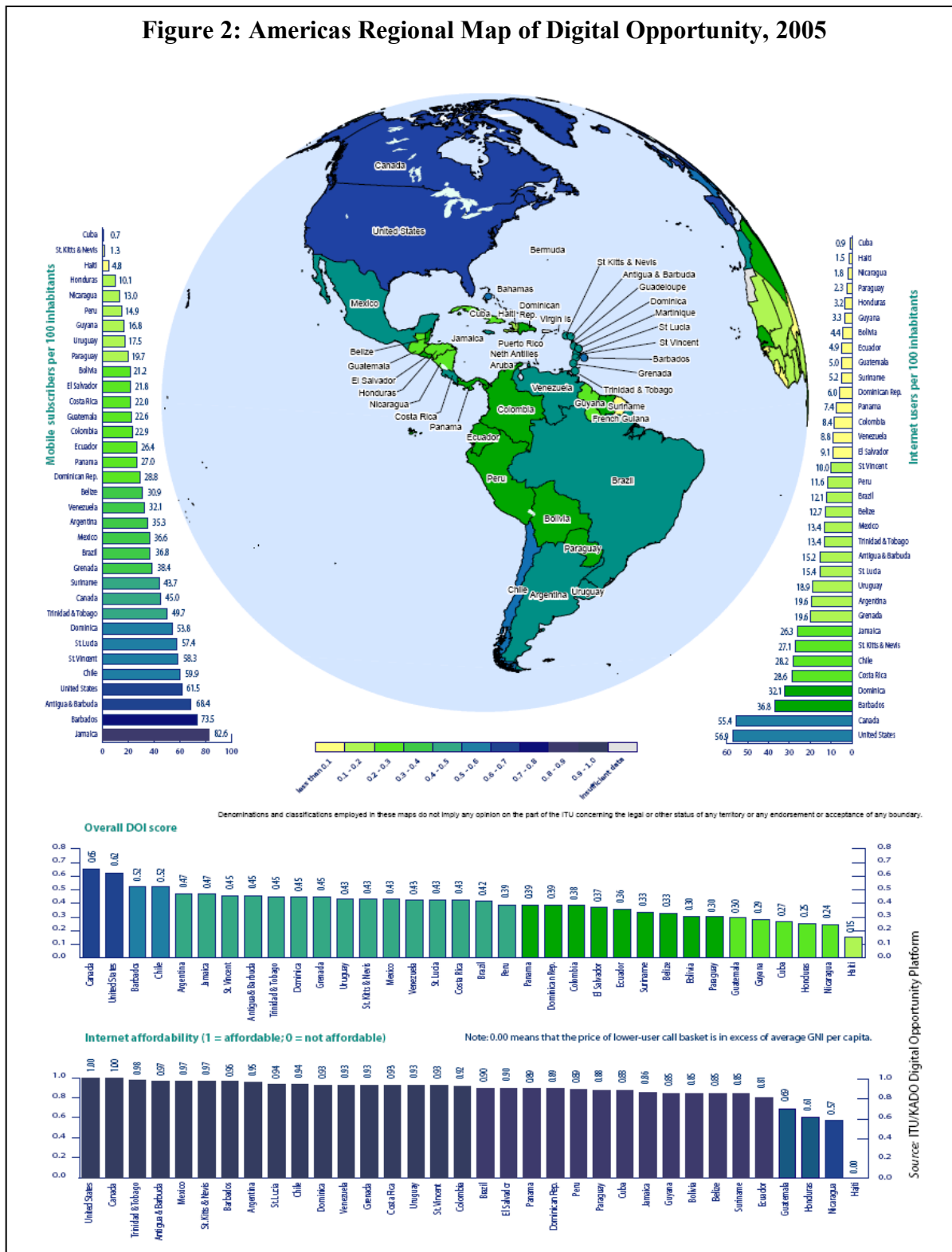
The World Summit on the Information Society (WSIS) has identified the evaluation of countries' progress in adopting ICTs as a priority in its Plan of Action. This assessment is being done using indicators that have been agreed on internationally. The resulting Digital Opportunity Index (DOI) is comprised of eleven indicators in the areas of opportunity, infrastructure and utilization. Jamaica's opportunity score is high; however, infrastructure and

resulting utilization have lower scores, contributing to the overall score of 0.47 and a global rank of 52.

Figure 2 shows the regional perspective of the DOI, with Jamaica reporting the highest mobile coverage (82.6) per 100 inhabitants. In terms of Internet use, Jamaica ranks eighth in the region, and sixth in terms of the overall DOI.

In 2003, Jamaica ranked second highest in percentage of GDP spent on information and communication technologies. This is shown in Figure 3 (World Development Indicators 2005).

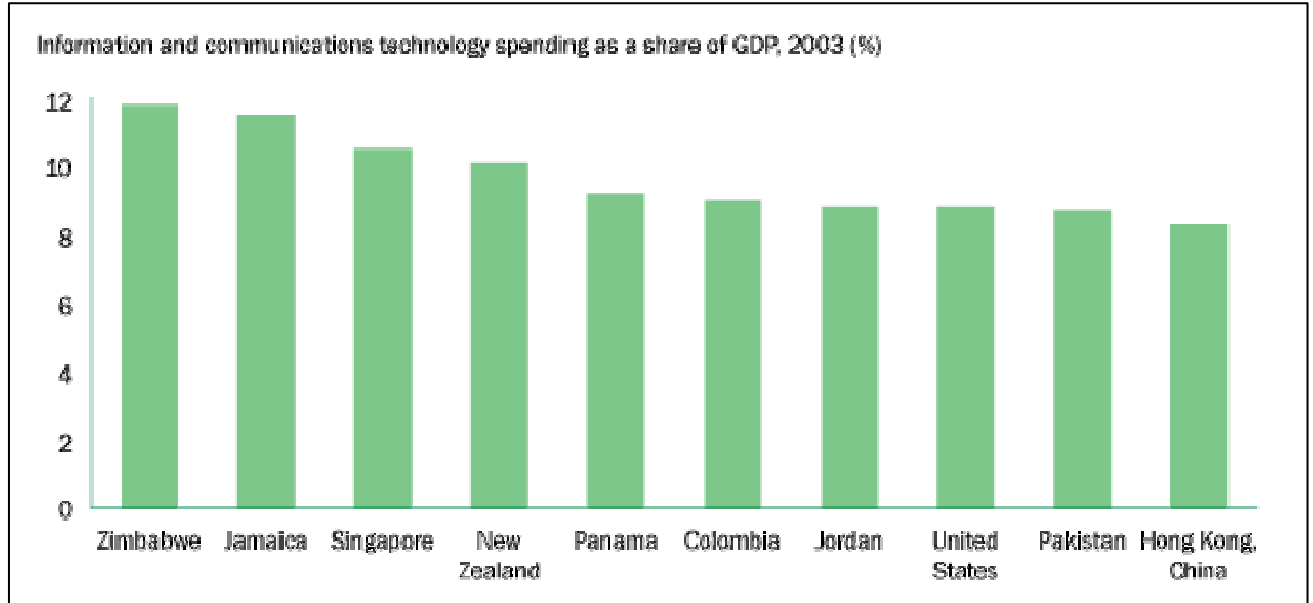
Figure 2: Americas Regional Map of Digital Opportunity, 2005



Source: World Information Society Report, 2006.

<http://www.itu.int/osg/spu/publications/worldinformationsociety/2006/Americas.pdf>

Figure 3. World Development Indicators



Source: World Development Indicators, World Bank, 2005

2.2.2 Digital Readiness for Social Mobility (Internal Focus)

At the national level, statistics are collected on ICT indicators at the household level through the Statistical Institute of Jamaica Household Census and the Jamaica Survey of Living Conditions. In the local context, the percentage of households reporting access to computers and the internet by parish in 2001 is shown in Table 2. Urban areas report greater access to technology.

Table 2. Levels of Computer and Internet Access by Parish

Parish	Percentage of households with access to a computer	Percentage of households with access to the Internet	Parish	Percentage of households with access to a computer	Percentage of households with access to the Internet
Kingston	7.8	2.3	St. James	10.9	4.6
St. Andrew	21.4	13.2	Hanover	6.8	1.4
St. Thomas	7.3	1.7	Westmoreland	5.3	1.3
Portland	7.0	1.8	St. Elizabeth	5.9	1.3
St. Mary	5.9	1.7	Manchester	9.6	3.3
St. Ann	7.6	2.4	Clarendon	7.0	1.5
Trelawny	6.4	1.2	St. Catherine	14.9	6.6

Source: Population Census 2001: Jamaica country report

There has been a dramatic increase in the number of cellular phone subscribers, from 367,000 to 2,700,000 over the period 2000–2004 (World Bank 2005). The 2005 estimate is 3,040,000 subscribers (ITU). Over this period, there has been an increase in the level of access to the Internet and personal computers; however, this has not been as dramatic. Internet usage has increased from 31 per 1,000 inhabitants in 2000 to 265 per 1,000 inhabitants in 2004. In 2005, there were an estimated 166,000 computers in Jamaica (World Bank 2005).

Within the business sector in Jamaica, the availability of computers is greater, although there is limited information on the actual numbers. In examining the demand for ICT business indicators in Latin America and the Caribbean, it was noted that Jamaica did not assess this demand (Partnership on Measuring ICT for Development). The increased access to the Internet by Public and Private Sector companies has facilitated the development of e-services. Increasingly, online transactions are being offered by public and private organizations.

In a statement to parliament in November 2006, the Minister of Industry, Technology, Energy and Commerce highlighted the options available to the public in terms of online bill payment facilities, in an effort to address the concerns about the service fees being charged by bill payment agencies. It was noted however, that the public's current level of access to computers does not enable the majority of Jamaicans to benefit from e-services. In this regard, the Government has removed taxes from computers and is trying to find lower-cost technological solutions. Additional initiatives are being planned to place computers in communities. Another example of an area in which the general public has been encouraged to use the Internet, is in the case of United States visa applications. The application form has to be submitted electronically, and Jamaicans are asked to use facilities that will enable them to complete this process online.

As digital readiness increases at the household and business levels in the local context, the society will be better enabled to benefit from the advantages of ICT use and to increase social mobility.

2.3. Information Systems Competencies

Information systems (IS) actualize the production of information, through the interplay of data, processes, interfaces, people, and information technology within the prevailing social environment of the implementing organization. Hence, the successful delivery of IS solutions requires a solid understanding of IT, the dynamics of the business environment, organizational business processes, and human behaviour.

Despite the impressive innovations that ICTs have permitted, there has been, for more than twenty years, the global perception of an IS delivery crisis stemming from the persistent failure of the IS community to match the phenomenal strides that ICT has made to consistently produce excellent organizational applications and deliver high-quality IS.

Most developing countries covet high-quality computer applications to enable operational and strategic priorities, and many crave a share of the software exporting market. In the Jamaican and Caribbean context, there is very little development of information systems, and COTS is

the dominant method for sourcing software. The appreciation of modern software production methods has also eroded, and systems delivery methodologies are not well understood. Knowledge of models for assessing the capability of software production processes is also sparse.

In tertiary institutions in Jamaica, Computer Science, and other IT-related programmes are the dominant branches of computing studies. Information Systems programs, which prepare students to become application specialists and information solution providers in a variety of business contexts, are hardly available. Information technology is a pivotal enabling component of IS; however, there are two other complementary co-requisites: understanding organizations and the business processes they use to accomplish their mission, and understanding the human context and the social systems with which technical systems must interact. These behavioural considerations have been demonstrated to pose the greatest challenges to IS success.

Many of the antecedent conditions identified by researchers in the software exporting area as requirements for the entry of developing nations into the worldwide software export industry seem attainable by English Speaking Caribbean countries. The influential factor that seems most challenging is the development of the IS delivery skills to realize such an ambition. Brazil and Costa Rica, Latin American entrants into this global market, have invested deliberately in the creation of human capital, emphasizing education at the tertiary level instead of remedial training, and enhancing IS delivery competency in their organizations.

2.4. Human Capital

2.4.1 Education and Training

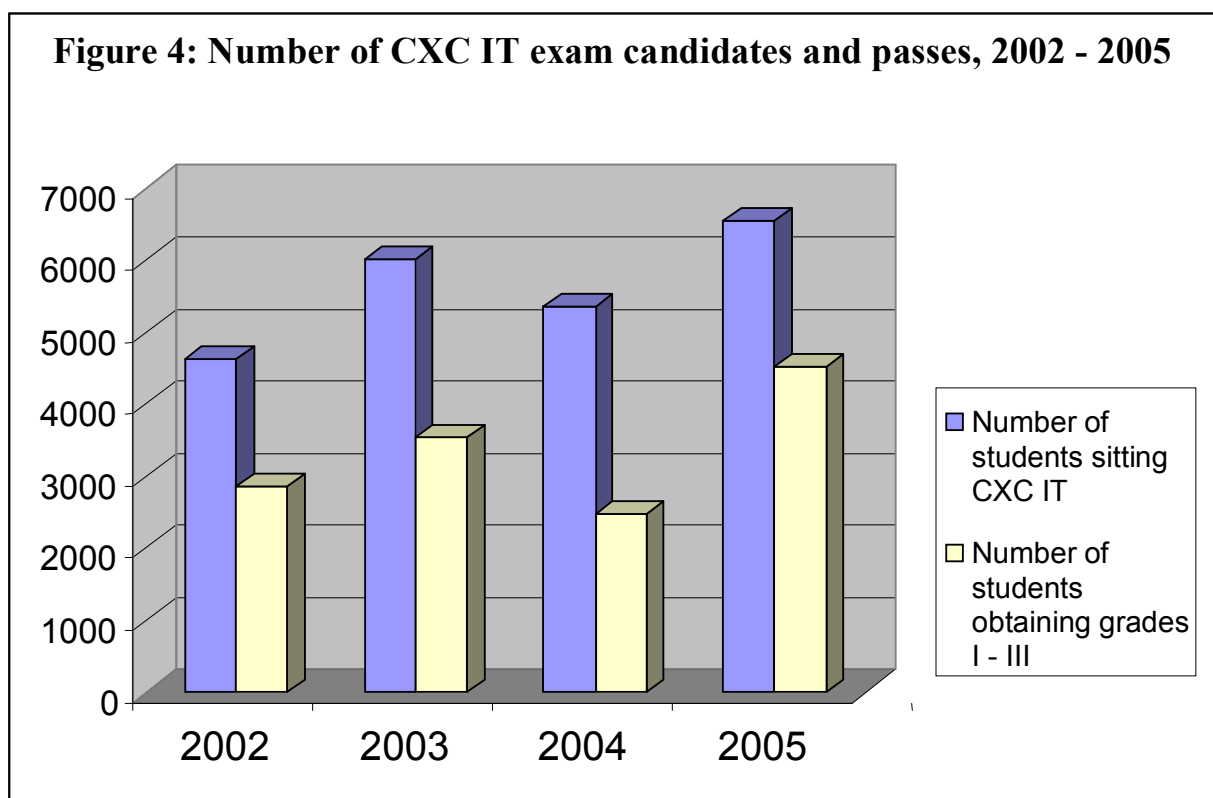
The 2004 Report of the Task Force on Educational Reform highlights the role of information and communication technology in enhancing student learning, one of the strategic objectives of the Ministry of Education and Youth. ICTs are seen as playing both a supporting role in education, as well as a being a part of the curriculum as an individual subject area. The report notes that a two-stage strategy proposed by the Ministry focuses on improving educational materials and teacher training, through Internet access. Training all teachers in the use of ICTs is a recommendation of the Task Force as a means of addressing the key issue of curriculum implementation. The strategy also includes the provision of Internet access to students in order to promote individual learning.

Initiatives have been implemented in an effort to provide access to the hardware and software platforms that are necessary for the integration of ICTs in the education system. At the primary level, one of the initiatives was the establishment of an Education Technology Resource Centre (ETRC) through the GOJ / USAID New Horizon for Primary Schools Project (NHP). The aim of this centre is to promote and facilitate information sharing and knowledge transfer among teachers, and between teachers and students. The ETRC has been established in one region as a pilot project. Other projects have included the provision of computers and internet access to schools. In 2005, at the primary and secondary school levels, some

assistance to information technology was also provided by the Secondary School Enhancement Programme (SSEP) and the Educational Assistance component of the Social and Economic Support Programme (SESP).

In order to provide software to support educational needs, the Ministry of Education and Culture is participating in the Microsoft Partners in Learning School Agreement. This enables the provision of software packages such as Windows XP, Microsoft Office Professional (Word, Excel, PowerPoint, Access, Publisher and Outlook), and Encarta Reference Library to schools across the island at a unit cost much lower than commercial rates.

At the secondary level, 6,545 secondary school students sat the Caribbean Examinations Council (CXC) Information Technology examination in 2005 with 69.0% attaining grades I – III (Economic and Social Survey Jamaica, (ESSJ) 2005 / Caribbean Examinations Council (CXC) Office). This was the highest percentage over the period 2002 – 2005 and the ESSJ 2005 highlights the 22.8% increase in pass rates. In terms of number of secondary school examination candidates, the subject area of Information Technology ranked sixth overall. Figure 4 shows the number of students sitting the CXC Information Technology exam and the percentage pass rates from 2002 – 2005.



Source data: ESSJ 2005 / Caribbean Examinations Council (CXC) Office Jamaica

In the Caribbean Advanced Proficiency Examinations (CAPE), there was a 95.1% pass rate (Grades I – IV) in Computer Science. The number of students pursuing studies in information and communication technologies at the post-secondary level continues to increase with several programmes being offered. Between 2004 and 2005, the enrolment of persons in HEART/NTA

programmes acquiring skills in the area of information and communication technology increased from 7,022 to 8,839. Similarly, there were increases at the community and secretarial colleges. Many of the community colleges offer associate degrees in information technology or management information systems, with two of the colleges offering Bachelors' degree programmes (PIOJ 2005).

The Caribbean Institute of Technology provides training in software development, web page design and computer networking.

At the university level, the University of the West Indies (UWI) and University of Technology (UTech) continue to offer degree programmes in Computer Science and Computer Studies respectively. The UWI also offers Masters Degrees in Management Information Systems and Computer Science, and has recently started a new programme in this area - the PhD in Information Systems. There are also institutes which offer specialized courses. Mona GeoInformatics at the University of the West Indies offers training in geographic information systems (GIS). In the area of GIS, the Geographic Information Systems in Schools Education Programme (GISSEP) was also established. Overseas universities have also been offering education and training in the area of ICTs by distance education.

There are several organizations – public, private, non-governmental or community-based, that provide education and training in ICTs. The Creative Production Training Centre (CPTC) offers a number of training programmes in information and communication technologies. The Jamaica Sustainable Development Networking Programme (JSDNP) has been providing training in communities and schools through its telecentres. Some of these telecentres are located in libraries, post offices and community centres. The Jamaica Library Service, through some of its programmes, provides training in information technology. In order to assist in increasing computer literacy, the Jamaica Foundation for Lifelong Learning (JFLL) will continue its computer education programme.

Other NGOs have provided information technology training to a range of age groups and social needs. The CLICK digital photography workshop held in August 2006 focused on teaching children from inner-city communities about digital media and life skills. Robotics workshops have also been held with a similar emphasis. There have also been projects which have offered ICT training for persons with disabilities.

These education and training programmes in information and communication technologies have been assisting in enhancing the skills and capabilities of Jamaicans in the area of ICTs. The 2005 Policy on Science and Technology for Socio-Economic Development highlights the need for increased competence in the area of information technology to promote information sharing in the society. Clear articulation and successful implementation of strategic objectives in ICT education and training will be important to the realization of the goals of the 2007 – 2012 National ICT Strategy for Jamaica.

2.4.2. Knowledge Management

Organizations worldwide are now paying greater attention to knowledge management, which is the process of harnessing, organizing and storing electronically, disseminating, and applying

the totality of the knowledge accumulated within their organizations, in order to improve consistency in operations and enhance decision-making. They see this as important from two perspectives: (1) from the resource-based view that this accumulation of their employees' knowledge is a primary organizational asset that must be managed like any other organizational resource; and (2) from the competitive outlook that if they create organizational knowledge repositories and establish barriers to their replication by external forces, this amalgam of knowledge has the potential to enable sustainable competitive advantage, especially in super-competitive environments.

In the local context, knowledge management activities are primarily in the area of knowledge sharing through participation in knowledge sharing networks and communities. These have been established at the Caribbean and regional levels in various sectors and generally aim to include the relevant stakeholders in the process.

Examples of these initiatives in which Jamaica is represented are the Caribbean Association of Business Associations, Caribbean Disaster Information Network, Caribbean Regional Agricultural Policy Network, and the Inter-American Biodiversity Information Network, and the OAS/Red GEALC – The Network of E-Government Leaders in Latin America and the Caribbean, sponsored by the Organization of American States.

There are several online discussion forums which facilitate information and knowledge sharing and help to establish linkages among communities, the Public and Private Sectors and the Jamaican Diaspora.

In 2005, UNESCO/ICT4D Jamaica hosted regional workshop on digitization of cultural heritage in the Caribbean, which encouraged the establishment of knowledge management systems in this area.

In a report to the World Conference on Disaster Reduction, the Office of Disaster Preparedness and Emergency Management (ODPEM) highlighted its involvement in knowledge management. This included the collection and dissemination of information on disaster management among all sectors, and through a variety of methods, and the infusion of research into the planning mechanisms.

As knowledge about customer information and preferences becomes increasingly important, the Public and Private Sectors are developing knowledge management systems.

3. Vulnerabilities and Disaster Risk Management

Natural disasters have always been a part of the physical and human landscape of Jamaica and they will continue to have a significant impact on the development of the country. Jamaica is among a group of Small Island Developing States (SIDS) that face a catalogue of vulnerabilities due to the combination of small size, location and susceptibility to natural and man-made disasters. Occasionally, development processes have also led to both environmental destruction in vulnerable areas and rapid expansion in disaster-prone locations, causing an increase in economic, social and environmental losses. The island's increasing levels of

vulnerability could have a negative impact on its rate of ICT diffusion. Paradoxically, these vulnerabilities could act as a catalyst for certain types of ICT diffusion. In order to establish a meaningful ICT disaster risk management (DRM) programme it is critical that a national system of measurement is put in place to quantify the impact of the vulnerabilities faced by Jamaica on the island's ICT diffusion process.

The issue of vulnerabilities in SIDS is multidimensional and, indeed, the complexity of the subject has prompted the development of a vulnerability theory which provides a framework that can help facilitate logical development and measurement. Theoretically, vulnerabilities are classified into three distinct tenets: economic, social and environmental.

Briguglio (2004) defines economic vulnerability as inherent, permanent, or quasi-permanent features of an economy which leave the country exposed to a very high degree of dependence on economic forces outside its control. The Commonwealth Secretariat (2005, 1) embraces a similar definition by stating that economic vulnerability "arises from exposure to adverse external shocks beyond the country's control".

The Jamaican economy appears to have all of the characteristics to identify it as being highly economically vulnerable. Allen and Gyles (1995, 1) state that "Jamaica has moved from the forefront of developing countries in most measures of living standards to join the laggards of the less developed countries". The weaknesses of the Jamaican economy stem from several issues that have contributed to low economic growth, indebtedness, and the trade balance has deteriorated significantly.

The second tenet of vulnerability faced by Jamaica, and other SIDS, is social vulnerability. According to Kirby (2003, 45) social vulnerability refers to "the harm actually being done to the fragile bonds of social belonging.", whereas Moser (1998, 3) defines it as being "closely linked to asset ownership. The more assets people have, the less vulnerable they are, and the greater the erosion of people's assets, the greater their insecurity".²

Social vulnerability is evidenced in:

- The island's GINI coefficient³ being, on average, higher in 2002 than in 1990.
- A number of social-ills, such as low-wage employment, a growing underground economy, an overstretched and under-resourced healthcare and social service, and the lack of sufficient rudimentary social safety nets.
- Fluctuating rates of unemployment and high levels of crime.
- The worrying number of new HIV/AIDS cases being reported each year.

The third tenet of vulnerability refers to the environment and how susceptible the island is to both natural disasters and adverse anthropogenic activity. According to Kaly et al. (2003, vii) environmental vulnerability is "the extent to which the natural environment is prone to damage and degradation". UNEP and SOPAC (2005, 4) provide a broader definition of environmental

² The assets are classified as being both tangible and intangible, such as labour, human capital, productive assets, household relations and social capital.

³ The GINI coefficient is a measure of consumption inequality and is based on a scale from 0 to 1.

vulnerability by stating that it is “the potential for attributes of any system, human or natural to respond adversely to an event”.

SIDS have limited capacity to absorb environmental shocks that can negatively influence both the biological integrity and health of ecosystems. Jamaica is faced with four main types of natural disaster: landslides, hurricanes, earthquakes and floods. In fact, according to the UNEP, the island experiences “high” levels of vulnerability with respect to the latter three disasters. For example, in recent times two hurricanes that had the most debilitating effect on the island were hurricane “Gilbert” (a category 3 hurricane) that hit Jamaica in 1988 and hurricane “Ivan” in 2004. Both of these hurricanes caused severe economic, social and environmental devastation. Indeed, the total impact of hurricane Ivan on Jamaica amounts to \$35,931 million Jamaican dollars, or its equivalent of US\$580 million (ODPEM 2006), approximately 8 per cent of the country’s GDP in 2003.

All countries in the throes of development (past or present) can be accused of engaging in activities deemed to be harmful to their country’s eco-systems and Jamaica is no exception. In fact, the island has numerous incidences of anthropogenic-induced environmental problems, ranging from over-fishing of coastal waters, the pollution of coastal plains and rivers, and the over-exploitation of land-use resources to rising levels of deforestation and deterioration in the levels of air quality, especially in urban areas.

As in many, if not all, developing, and indeed, developed countries, the diffusion of ICT can have a significant impact on the development process. In terms of developing countries ICT diffusion could be a necessary catalyst for economic growth. Indeed, it could be the case that for some developing nations ICT diffusion will provide an opportunity to technologically leapfrog certain stages of development.

Jamaica has been trying to exploit the benefits from the diffusion of ICT by attempting to integrate its usage into its social and economic fabric. In comparison to the rest of the Caribbean, Jamaica is at the forefront with respect to the diffusion of ICT. However, the island’s telecommunication infrastructure needs to be continuously adapted in order to take into consideration the many vulnerabilities faced by the island and to build increasing levels of resilience into its telecommunications systems. It is imperative that an ICT disaster management programme, incorporating appropriate measurement tools, is put in place in order to facilitate the creation of a resilient telecommunication system that can minimize many of the vulnerabilities the island is exposed to.

It is becoming increasingly prudent for countries, both developed and developing, to establish an ICT DRM programme. It is absolutely critical for a SIDS, like Jamaica, to integrate such a programme within its national ICT agenda. The ICT DRM programme should be integral to the national development programme as well as the national post-disaster reconstruction plan. In order to integrate an ICT DRM programme into national development policies and practices, the impact of vulnerabilities on the ICT diffusion process needs to be quantified on a continuous basis and in a manner that can be easily understood by both public and private decision-makers to inform national public policy and pre-disaster initiatives and planning.

While the occurrence of many vulnerabilities, especially natural disasters, cannot be prevented it is possible to reduce their impact. Hence, there is an urgent need to formulate an ICT DRM programme that measures vulnerabilities and establish mitigation strategies. The absence of such a programme could seriously threaten Jamaica's ICT diffusion process and subsequently jeopardize the island's progress along its path of development.

III. EVALUATION OF PREVIOUS PLANNING PERIOD 2002-2006

1. Contextual Overview and Critique

The 2002 Strategy provides one of the baselines against which the new strategy is being developed. The 2007-2012 National ICT Strategy update attempts to plug visible gaps in the previous strategy and implement identifiable changes towards improved content, structure and presentation.

While the 2002 Strategy identified important strategic priorities for Jamaica's ICT development, its implementation seemed to have encountered severe setbacks. There was no adequate follow-through to translate the strategic targets into actionable projects mainly because there were little or no implementation recommendations. Although CITO was identified as the organization responsible for coordinating and overseeing the implementation effort, the agency was grossly under-resourced. There was also no specified process for extracting actionable items and assigning them to identified champions in the various sub-sectors. In hindsight, CITO was neither endowed with the requisite resources, nor empowered to undertake such a mammoth assignment. **For the new strategy to be successful these deficiencies must be corrected.**

The 2002 Strategy provided a sound assessment of the prevailing ICT challenges and opportunities that the nation faced at that time and identified issues of national importance, which were appropriately included in the strategy. However, it appeared to be deficient in the following regards:

- While the section on “vision” contained useful information, it lacked clarity in explicating the rallying focus for driving the eventual outcome. There was also no reference to national ICT policy or strategic mandates, or any identified national policy framework for providing the rationale and motivation for the proposed targets.
- The discussion of the local setting was confined to an overview of the Jamaican ICT industry and would have benefited from a more extensive examination of national capabilities, vulnerabilities, and opportunities, as well as analyses of the regional and global contexts.
- Except for the acknowledgement of the assistance provided to the planning process by the Information Technology Advisory Council and the sponsors, there was no evidence of any attempt to incorporate stakeholder perspectives.
- The presentation of the strategic targets was not always definitive and included a mix of philosophical statements, wishes, recommendations, and statements of possibilities.

- Plans, methodologies, projects, recommendations and accomplishments were all commingled in the details, which made it extremely difficult to isolate and extract strategies and action items.
- Strategic objectives were not always outcome-centric and action-oriented and sometimes failed to identify specific *deliverables* from *specific suppliers* to *specific beneficiaries*.
- Quite often, the statement “...to be extended as necessary” completed bullet lists. This created the perception of incomplete analysis and a lack of thoroughness.
- In some cases, action items contained expressions of possibilities instead of definitive, purposeful statements of intent.
- The strategy needed to recommend an implementation framework, assess the feasibility of strategic targets, and identify implementation risks.

2. Planned Achievements

The strategic targets of the 2002 Strategy were presented in two categories: short-term goals (Phases I and II), which were planned to be undertaken consecutively, and long term goals. The list below identifies those items that have been accomplished:

- The strategic information technology vision for Jamaica has been articulated by both the Prime Minister and the Minister of Industry, Technology, Energy, and Commerce
- Jamaica has continued to promote competition into the telecommunications industry and growth of the ICT sector.
- Although some Chief Information Officer positions have not been established, the majority of ministries have created MIS Director positions and there are IT Specialists in many of their agencies and departments.
- JAMPRO has assisted in promoting investment and facilitating partnerships in the ICT industry by helping to attract some ICT firms to Jamaica
- Several activities are underway and others contemplated, under the umbrella of the Public Sector Modernization Unit and the IDB ICT Project, to improve the provision of efficient government services to the public through the use of ICT

3. Gap Analysis

The preceding list of planned accomplishments denotes that there is considerable distance between actual performance and planned performance. The majority of the planned activities were never attempted, primarily because of the non-existence of an implementation framework. This underscores the importance of embedding implementation strategies as an element of the current and future plans and providing some insights into implementation

capability deficiencies. This analysis seeks to identify the variance between planned and partially accomplished activities and lists those that have not been attempted at all.

Following is a list of planned activities for which some progress was made:

- The government's e-learning project managed by e-Learning Jamaica Company Limited will accelerate the establishment of computer labs with Internet access eventually to 150 high schools from grades 7 to 11.
- The Primary Education Support Project (PESP) and Education Transformation Team (ETT) project out of the Ministry of Education, set up to address ICT in education, have made initial steps through pilots to establish the use of educational technologies at the primary school level.
- The GovNet Jamaica project which is being formulated to provide a single, multi-sector, multi-vendor network to serve the various ministries, departments, and agencies could help to facilitate the ease of public access to Government services and information and improve government's operational efficiency.
- Some ministries have undertaken useful ICT projects, if not the more substantive effort of developing tactical plans to implement elements of the strategy that relates to them.
- CITO was created, but the plan to staff the office, initially with about 12 people, and to expand the staff over time, did not materialize. The CITO budget is far less than the projected annual spending of 2 to 4 percent of the government's budget on ICT which was planned to begin in the fiscal year 2001.
- The initiative to review the current procurement process and streamline procurement systems in the Ministries, departments and agencies is underway.
- There has only been limited progress with the very ambitious target to discuss the strategy with Stakeholders (Parliament, the Ministers, all government employees, the private sector, and the academic community).
- The intention to install computers in public places to provide access to e-mail and the Internet may have been helped somewhat by the efforts of Grace Kennedy and Western Union in installing computer kiosks with Internet access in parish libraries.
- Several e-Government initiatives are underway to carry out basic Government functions, with some instances of complete e-payment services within the fiscal sector. However more widespread implementation in other sectors of e-commerce activity is lagging.
- The Government has made some progress in enacting legislation to facilitate the appropriate environment to encourage private sector activities in ICT; however more needs to be done to reduce regulatory and administrative barriers.

- Progress has been made in the provision of user-friendly electronic access to import/export information, market research reports, customs duties, information on international financial assistance and with the system to standardize trade and transportation data; however, the information is largely only available to the active participants in the sector or related businesses.

The following remaining planned activities seemingly experienced very limited, and in some cases, no follow through:

- The objective to obtain buy-in from all stakeholders.
- The development of a network of government, industry and university ICT points of contact.
- Several studies have been undertaken to determine the current status of ICT, however, they have not been disseminated to all sectors as planned.
- The progressive series of at least three pilot projects in each ministry to be accomplished in the first year of the strategy (e.g., electronic commerce application for farmers/small businesses to use to seek out new niche markets for their sauces, jams, jellies, coffee and other products).
- The establishment of a Public Awareness Programme.
- The comprehensive plan to address educational needs in all sectors of society.
- The establishment of a system of incentives to spread IT activities geographically in Jamaica.
- The review of the strategy at least once a year (March) in order to monitor progress in implementation according to prescribed benchmarks.

4. Some Unplanned Accomplishments

- An emergency text messaging service has been implemented as a cooperative effort between Digicel and the Jamaica Constabulary Force (JCF) targeted at combating crime and facilitating emergency police services to the public. The service allows the public to transmit real-time text messages to the JCF police control centre.
- The National Youth Service (NYS) is hosting the government's Information and Communication Technology (ICT) Training for Persons with Disabilities Programme to help these persons acquire valuable computer skills. Several disabled persons are currently enrolled in the programme at four locations, the Social Development Commission's office complex, the Jamaica Society for the Blind, the Lister Mair-Gilby Senior School for the Deaf, and the Waterford High School.

- The JSDNP/UNDP/Microsoft Computer Training project provides ICT training for marginalized youths from volatile communities, to prepare them to contribute meaningfully to their communities.
- CITO commissioned a project to develop web standards for GOJ ministries, departments, and agencies, which was undertaken by a sub-committee of the Management Information Systems Officers Corp.
- CITO established a series of regional technology Summits in 2004 aimed at demystifying technology issues for business and government leaders and empowering technology managers. The topics addressed in each Summit held to date were: Information Security, Wireless Connectivity and ICT in Disaster Preparedness and Management.
- An ICT Technical Working Group was formed by the Cabinet Information Committee to provide technical advice (particularly in reference to ICT) to the interministerial committee on information. The Technical Working Group was charged to look at the prospect of a Single Regulator for the telecommunications sector and Jamaica's contribution to the WSIS agenda.
- The Universal Access Fund has been launched to expand Internet access over a national broadband network, and support E-learning and other similar projects.
- An Open Source Migration pilot project has been launched to establish an alternative to the procurement of proprietary software systems for government use and to provide a credible alternative by 2007.
- A project has been launched to establish electronic document management standards and an Electronic Records Management System (ERMS) to improve and safeguard Public Sector records and archive management.
- The health sector is developing a National Health Information System that will be supported by the deployment of a national network.
- The Jamaica Constabulary Force has built a national wireless network to handle police communications and data transfer. This network is planned to become active in early 2007.
- The National Works Agency (NWA) is deploying a national public safety network upon which many other government services can be deployed.
- The Teachers' Colleges across the country have been connected via a dedicated wireless network – a project spearheaded by the Joint Board of Teacher Education (JBTE) based on the UWI Mona campus.

- The Ministry of Finance and Fiscal Services Ltd. have established FisNet to interconnect all fiscal and trade related agencies to support online revenue collection and trade facilitation systems and services.
- E-transaction legislation, to promote authentication of, and facilitate secure electronic transactions, has been drafted and has been passed by the Lower House of Parliament.

IV. RESEARCH RESULTS AND CONSULTATIONS

As evident from global ICT strategic planning experiences, a holistic and integrated approach is needed in creating a complete and successful national ICT strategy. This approach involves building of social partnerships, which will result in a shared vision of the information society the stakeholders wish to create. Since national ICT plans are spearheaded by governments, the relevant state agencies have a duty to create an environment of transparency, partnership and extensive stakeholder participation to create ‘buy-in’ and a sound ICT strategy. Additionally, the delivery of improved government services will depend on greater stakeholder involvement in more flexible and responsive institutional arrangements.

The main field research aims were:

- To identify the vision for the information society i.e. “what society we want to build”;
- To identify the e-strategy priorities;
- To incorporate new government policies and stakeholder thinking regarding ICT changes in the local and global environments;
- To obtain the positions and the insights of key stakeholders from primary research.

1. The Data Gathering Process

During the development of the strategy, a wide cross-section of key stakeholders including several key decision makers both in the public and private sectors were interviewed, and many more online questionnaires were distributed for input into the strategy. This group included technological experts, NGO leaders, government officials and private sector leaders. The data gathering effort also consisted of public forums in Montego Bay, Ocho Rios and Kingston.

The data gathering process sought to:

- Accurately identify the stakeholder community and a shared vision for the future;
- Confer with stakeholders in a limited series of focus group discussions and public consultations to canvas opinions and insights in order to enhance decision-making;
- Conduct interviews and town meetings surveys among selected stakeholders, including representatives from the private and public sectors, NGOs and from the academic community.

2. Sources and Key Findings

As stated before, a wide cross-section of key stakeholders were consulted for the strategy. Appendix II contains a list of persons that participated in consultation process.

Findings

The survey requested that stakeholders think of the vision that they would have for Jamaica once the NICT Strategy has been implemented. The following are some vision statements put forward:

- The achievement of efficiency of the Public Sector through technology with the seamless transfer of information between agencies.
- The use of ICTs across the nation as a catalyst for growth and economic development
- To educate Jamaicans in the use and adoption of ICT and to make computing technology accessible to every Jamaican.
- The use of ICTs as an enabler to realize sustainable national development, from an economic, social, cultural and political perspective. It should address key issues regarding access to opportunities for wealth generation, welfare, equity, transparency, informed citizenship.
- The inclusive access and use of ICTs for enhancing the position of low-income groups in the Jamaican society

Overall the preponderance of vision statements focused on education, capacity building and greater access to ICTs towards national development.

Key Strategies

The following are the key strategies that emanated from this process:

Enhancing Skill levels in ICTs: This was one of the areas stakeholders considered a priority. Although respondents came from a range of industries and backgrounds, human capacity in ICTs was considered to be a major element to be targeted by the strategy. This should be from pre-primary to the tertiary levels. This would mean internet access and greater prevalence of computers in all educational institutions. Teachers need to be trained in using the technology. These strategies will require greater allocation of resources to education and training. Government agencies and NGOs particularly, were interested in programmes to inspire greater confidence in the use of ICTs while private sector entities were interested in specialized technical training. The modernization of educational and training facilities was another priority identified. Investment programmes for high-tech training is also an element to be considered within the strategy.

The use of ICTs for economic growth: Respondents saw the need for the greater use of ICTs in business for different purposes. This included getting small businesses and organizations online. It was considered vital that businesses come on board to drive the National ICT

Strategy and reap the benefits of ICTs. Incentive programmes for foreign agencies, large corporations and SMEs to drive ICT development was a strategy mentioned, however, care must be taken to determine the best way to make this mutually beneficial. The possibility of exporting ICT services was an opportunity identified. This would include the application of ICTs to support income opportunities for low-income groups.

Infrastructure: For some respondents the physical infrastructure for ICTs was not at the appropriate level for competitiveness. The Internet should be ubiquitous and seamless and the network reliable and fast, so ICT planning efforts should make this a goal. Internet access should be available at a lower cost with higher speeds. A solution to this challenge may be coming on stream with Digicel's plans for an island-wide broadband WiMax (wireless) network to be implemented shortly that will be available in rural and remote areas as well as urban centres.

Legislation and Policy: The policy framework needed for ICT development in Jamaica should rest on facilitating businesses in their efforts including low tax regimes, minimizing red tape and lowering barriers of entry into the sector. It is vital, however that these incentive programmes fall in line with private sector business goals and state clear exchange of values. Government systems should be fair and transparent. The regulatory framework should provide for innovation while still protecting property rights. It was also recommended that there should be involvement of a wider cross-section of stakeholders in policy development and review.

Access: Although there is overwhelming access to voice communication, the internet and computers are used on a more limited scale. Priorities indicated include changing the image of computers and IT to be the "in thing" as mobile telephony is now. The NICT Strategy should try to promote demand for other ICTs. High cost is also something that needs to be addressed with regards to improving access. Respondents visualized a country where the internet is widely available throughout Jamaica and used by all students at the tertiary and secondary levels.

Disaster Recovery: The need for reliable disaster recovery mechanisms was identified as a challenge. Respondents were concerned that delays in getting back online after a disaster has a negative impact on competitiveness and productivity. The ICT strategy therefore, must determine the best mechanisms for improvement in this regard and determine standards that will apply nationally.

E-Government: The use of technology in public sector organizations was also a concern. Some objectives identified included: creating integrated government; reducing inefficiency in government; enhancing transparency, trust and communication between citizens and local governments and creating national wealth. It is noted that strides have been made in e-government with some services now available online; however, adoption strategies are needed for more citizens to make use of the relevant systems.

Research and Innovation: The inadequacy of research on ICTs in Jamaica was pointed out as a challenge. Strategies to develop research facilities are therefore required as well as research development in tertiary institutions. In the areas of research and innovation the role of

academia should not be underestimated. The government should consider young students as potential sources of innovation. Open source software (OSS) can be used to the advantage of the nation if researchers spend time working on customizing existing OSS applications for the Jamaican context.

The use of ICTs in the Culture Industry: Stakeholders identified the importance of the cultural industry in the nation's development. Technology is a driving force for the industry as it enables the production of music, video and other cultural products. It is not only production that technology enables but also its distribution and regulation. Technology has made it so that more persons can access the cultural artifacts and this will have a positive effect on the Jamaican Brand. However, some challenges need to be addressed including intellectual property rights and preserving the standard of Brand Jamaica.

The need for implementation of the NICT Strategy: Many of the respondents were concerned about the implementation element of the National ICT Strategy. They were keenly interested in the strategy but skeptical as to whether it would truly be materialized in solid programmes and initiatives. To this end, it was posited that the strategies be implemented. It was also pointed out that attainable targets be associated with each implementation strategy. The leading agency, which is proposed to be CITO, will have to be empowered with the human capacity to implement the strategy. Also important is the sustainability of the strategy for years to come regardless of which government may be in power.

Town Meeting – Montego Bay

The Montego Bay town meeting was held on October 19, 2006 and was attended by a number of stakeholders from the civic business community there. The key themes identified in the first town meeting were:

- Building human capacity
- Support for Business Development
- The expedition of enabling policies
- The creation of a measurable and implementable plan.

Key discussion points:

- Jamaica has the potential for obtaining competitive advantage for ICT outsourcing with English as the first language, proximity to North America and shared culture as well as a favourable time zone. There are over 14,000 jobs in the Jamaican ICT industry (mostly in Montego Bay).
- Education was a key concern. In the Montego Bay Free Zone the demand for trained persons is high. Persons need to be trained to support the growing industry and generally to learn to appreciate the benefits of ICTs. English Language was a key concern, and a call was made for the education system to focus on teaching 'proper' English in schools as it is now the 'world's currency'. Training in US geography was also recommended.

- Laws need to be improved for e-business, especially those which guard against electronic fraud.
- For foreign companies there used to be a number of hindrances that no longer exist including the prohibitive cost of technology and lack of redundancy. In these ways, Jamaica has come a long way. However, representatives of these companies spoke to the persisting problems with red-tape and bureaucracy in regard to work permits and other processes.
- A point also raised was the need to manage the growth of the industry in terms of housing and office space. The exploration of new concepts such as virtual offices can assist in this regard.
- It was proposed that technology nodes be established in different areas across the island so that the access to ICT jobs can develop in rural areas as well.
- Adoption strategies are required to make people use the ICT services.
- There is a natural tendency of Jamaicans towards entrepreneurship. It was proposed that we think of the use of ICTs to assist this natural inclination.

Other Public Consultations

Jamaica Computer Society BizTech Forum 2006

The JCS agreed to facilitate the hosting of a public consultation session on the strategy during their annual BizTech Forum held October 27-29, 2006 in Ocho Rios. Approximately 100 persons were in attendance at that session. Although many of the concerns raised through other consultation efforts were reaffirmed, one particularly area of emphasis was strongly raised. That of the need to develop a viable local ICT and e-Business Industry or sector, in addition to developing ICTs as a crucial enabler for all sectors of the society and economy.

JAMPRO E-Business Public Forum

Jamaica Trade and Invest (formerly JAMPRO) hosted a public forum on Jamaica's e-business development on November 30, 2006. Approximately 150 persons were in attendance. Again, previous concerns were re-iterated, but key emphasis from the audience was being given to the need to ramp up Jamaica's literacy levels to facilitate effective participation of all persons in this digital economy. Further, the need to effectively address the high cost of computing technology and data access, in order to significantly increase both PC and internet penetration, if we as a country are to take advantage of the new opportunities being realized through ICTs.

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Q2. What should be the special vision and central theme of the National ICT Strategic Plan? Please explain.



Q3. What three (3) main achievements should we have made in national ICT development at the end of the next five-year phase of this Plan in 2012?



Q4. In what specific new ways can your company, agency or sub-sector contribute to effectively develop Jamaica's emerging ICT industry and realize the goals of a new Strategic Plan?



Your name and position



Thank you!

2. General Interview Questions

What should be the special vision and central theme of the National ICT Strategic Plan?

What achievements should we have made in national ICT development by 2012?

How should ICTs aid interaction between the Private and Public Sectors?

How should ICTs aid interaction between ordinary citizens and Public Sector?

How can ICTs assist in enhancing Jamaica's global communications and at what level should it be 2012?

How can local communication be further advanced by ICTs ?

What are the necessary laws needed to be enacted towards ensuring that the financial system is not violated and abused?

What role should ICT play in the education process; at the pre-primary, primary, secondary and tertiary school level? Identify the most important element needed today?

How can ICT be used in crime fighting?

How do you envision ICT to develop or be integrated the following areas in 5 years:

- ✓ Tourism
- ✓ Agriculture
- ✓ Communication
- ✓ Society –culture, sports, music

What are the social values and consequences of ICTs integration on employment opportunities and health?

Appendix II - List of Stakeholders who Participated in Consultations

This list is not all-inclusive; therefore some names may have been inadvertently omitted

- Mrs. Pam Thompson, former Chairman, Central Information Technology Office
- Mr. Patrick Casserly, CEO E-Services Group International and Chairman, Central Information Technology Office
- Mr. Michael duQuesnay, former CEO, Central Information Technology Office
- Mr. Dainsworth Richards, Acting CEO, Central Information Technology Office
- Dr. Elaine Wallace, ICT Policy Analyst and Lecturer, Department of Liberal Studies and Education, University of Technology
- Mr. Ansord Hewitt, Manager, Regulatory Affairs, Office of Utilities Regulation
- Dr. Gerald Grant, ITA Consultant, Ministry of Industry, Technology, Energy and Commerce
- Hon. Philip Paulwell, Minister of Industry, Technology, Energy and Commerce
- Dr. Jean Dixon, Permanent Secretary, Ministry of Industry, Technology, Energy and Commerce
- Ms. Karlene Francis, Director General, Ministry of Industry, Technology, Energy and Commerce
- Ms. Wahkeen Murray, Legal Officer, Ministry of Industry, Technology, Energy and Commerce
- Hon. Aloun N'dombet Assamba, Minister of Tourism, Entertainment and Culture
- Mr. Courtney Jackson, Deputy Director General – Telecommunications, Office of Utilities Regulation
- Dr. Maurice McNaughton, Director, Information Services, Jamaica Public Service Company and Former Chairman, ICT Committee, Private Sector of Jamaica
- Mr. Carlton Samuels, Managing Director, Mona Information Technology Services, UWI
- Mr. Danny Roberts, Vice President, Jamaica Confederation of Trade Unions
- Mr. Chris Hayman, Head of Business Services, Digicel Jamaica and Chairman, ICT Committee, Private Sector Organization of Jamaica
- Mr. Lloyd Distant, Vice President, Corporate and Business Services, Cable and Wireless Jamaica
- Mr. Mervyn Eyre, Chief Executive Officer, Fujitsu Transaction Solutions (Ja.) Ltd.
- Mr. Garfield Campbell, Executive Member, Jamaica Computer Society
- Mr. Errol Anderson, General Manager, Xsomo International and President, Jamaica Computer Society
- Mr. Cuthbert Lloyd, Advisory Client Representative – Government, IBM Jamaica
- Mr. Christopher Reckord, CEO, Innovative Corporate Solutions Ltd.
- Mr. Joseph Manley, Head of IT Strategy Unit, Ministry of Finance and Planning
- Mr. Richard Gordon, Project Manager, IDB ICT Project, MITEC
- Mr. Stuart Fisher, Senior Vice President, Superclubs
- Stijn van der Krogt, International Institute for Communication and Development Team Leader, Country Programmes (ICT4D Jamaica)
- Ms. Loeki Schaeffers, International Institute for Communication and Development Country Manager for Jamaica, ex-Officio member of ICT4D Jamaica's Board
- Ms. Vinette Keene, Director General, Tax Administration, Ministry of Finance and Planning
- Mr. Sherlock Glenister, Director, Business Development and Technology, National Land Agency
- Mr. Christopher McNair, Manager, Investment and Promotions, Jamaica Trade & Invest (formerly JAMPRO)
- Dr. Patrick Williams, Vice President, Technology, Extensions & Strategic Planning
- Ms. Elizabeth Terry, Chair, ICT4D Jamaica
- Ms. Charmayne Weir-Germia, Director, Songwriters in Ministry
- Mrs. Pamela McLean, Managing Director, National Export-Import Bank of Jamaica Ltd. (EXIM Bank) and her team
- Mr. Andrew Lee, General Manager, Jamaica Digiport International
- Ms. Pauline Reid, President, Montego Bay, Chamber of Commerce
- Mr. Jonathan Hummel, Vice President, Employee Development, e-Services Group International
- Mrs. Lynda Langford, Operations Manager, Affiliated Computer Services (ACS)
- Mr. Gordon Brown, Attorney-at-Law and Board Member, Montego Bay Free Zone
- Mr. Samuel Bowen, former Managing Director, Caribbean Institute of Technology (CIT)

- Ms. Carlene Smith, Acting Managing Director Caribbean Institute of Technology (CIT)
- Carla Marzouca, Managing Director, Cazoumar Investments Limited
- Mr. Mark Kerr-Jarrett, Montego Bay Chamber of Commerce
- Ms. Jacqueline Lawson, HEART Institute of Jamaica
- Sen. Noel Soley, Senator and Chairman, Montego Bay Free Zone
- Ms. Dionne Richards, Marketing Executive, Jamaica Digiport International
- Ms. Gloria Henry, Operations Manager, Montego Bay Free Zone
- Mr. Stephen Dear, Assistant Vice President, First Global Bank
- Mr. Michael Hicks, Chief Executive Officer, Bay Telemarketing
- Ms. Donna Thompson, Director, Satellite Imaging Systems
- Mr. Nigel Gayle, Satellite Imaging Systems
- Ms. Joy Todd, EDP Manager, Ministry of Agriculture
- Mr. Gary Campbell, ICT Manager, Rural Agricultural Development Agency (RADA)
- Mr. Herman Athias, Productive Business Solutions Ltd.
- Mr. Otis Fisher
- Mr. Lorenzo Grant, Managing Director, Fiscal Services Ltd.
- Mr. Vivian Brown, Senior Director, Modernization & Special Projects, Ministry of National Security
- Rev. Wilfred Alexander
- Ms. Diana Kellier, student
- Mr. Fabian McGowan, National Accounts Manager, MiPhone
- Mr. Michael Morris, Secretary Manager, St. Catherine Parish Council
- Mr. David White, Kingston and St. Andrew Corporation (KSAC)
- Mr. Keith Smith, Director, Kanbay International
- Mr. Garfield Knight, President, Geonet Technology Services
- Ms. Melesia Sutherland-Campbell, Regulatory Advisor, Legal, Regulatory & Public Policy, Cable & Wireless Jamaica Ltd.
- Mr. Chris Evans, Foreshore Ltd., Jersey, Channel Islands
- Mr. Neil Pierre, Director, UN ECLAC Subregional HQ for the Caribbean, Trinidad
- Ms. Sandra John, UN ECLAC Subregional HQ for the Caribbean, Trinidad
- ICT Division, Ministry of Public Administration and Information, Government of the Republic of Trinidad and Tobago (GORTT) – Mr. Cleveland Thomas National CIO, Mr. John Mollenthil Deputy NCIO, Mr. Adam Montserin Executive Manager E-Government
- Mrs. Juliet Agard, Director, Data Processing Department, Government of Barbados
- Mr. Richard Lumsden, Planning Institute of Jamaica (PIOJ)
- Ms. Sonia Gill, Assistant Director, Broadcasting Commission
- Mr. Hugh Cross, Managing Director, Universal Access Fund
- Ms. Nicole Foga, Partner, Foga Daley & Co.
- Mr. Lawrence McNaughton, Senior Regional VP for Career Service Dept, Cable & Wireless Ltd.
- Mrs. Deonne Richards, CEO, Perfecto Grafixx
- Mr. Paul Beswick, Partner, Ballantyne, Beswick & Co.
- The GoJ MIS (Management Information Systems) Officers
- The public through forums in Montego Bay, Ocho Rios and Kingston

APPENDIX III - Overview of Country Studies

The following countries were studied:

- Canada
- Ireland
- New Zealand
- Singapore
- Barbados
- Trinidad and Tobago
- Malaysia
- Ghana
- Chile

COMMON AREAS

Recurring areas of consideration in the country studies are as follows:

Human Resource Development. For example:

- Capacity building through e-Learning
- ICT training of professionals and persons in the public sector
- Improving educational opportunities through ICTs
- Access in terms of knowledge of ICT systems
- Achieving a digitally literate / techno-literate / infocomm savvy society
- Community-led access creation
- The forging of cyber-communities
- Awareness and promotion of the ICT Plan

Economy and Finance. For example:

- E-Commerce
- Interlinking sectors to boost productivity
- Developing and funding SMEs and “Technopreneurs”
- Enhancing the contribution of ICT to productivity

Government. For example:

- E-Government portal
- Reducing red tape for foreign investors.
- Cyber Safety Awareness
- Updating record-keeping standards
- Availability of necessary health / justice information
- Interconnection of Government Entities

- Public Sector Reform
- E-Health and Teleconsultations
- E-Justice

Infrastructure Expansion and Improvement. For example:

- Use of accessible, effective, affordable and appropriate technology
- Broadband strategy
- Universal Access to hardware, software, connectivity

Legal Issues, i.e. the revision and implementation of enabling policy and legislative frameworks involving:

- Electronic Transactions
- Electronic Security
- E-Crimes
- Legislation regarding content

Innovation. For example:

- More facilities and funding for research and development
- Creating networks for those involved in research and development
- Developing new ICT products

Content. For example:

- The archiving of national content
- Using ICTs to promote the country's brand and national identity
- Ensuring the population can access the information they need
- Intellectual Property Management

UNIQUE STRATEGIES

- Canada's strategy focuses on the development of human capital through its Innovation strategy. Canada has already achieved many of the other goals including the penetration of broadband, an appropriate policy framework and the development of smart communities.
- Canada, in its goal to develop the most skilled and talented labour force in the world is working towards receiving skilled immigrants and to assist them in achieving their full potential. Similarly Singapore aims to attract and retain international ICT talent.
- A part of Singapore's strategy is to make itself a technology and innovation hub. Malaysia has a similar strategy.
- Barbados as well as Singapore has decided to forge strategic alliances and partnerships with other countries.

- Barbados has made a part of its strategy “establishing Brand Barbados”
- New Zealand has factored in the sustainability of the environment in its ICT Strategy.
- New Zealand places a great emphasis on content in their strategy as a means of preserving and capitalizing on their cultural capital.
- Malaysia has introduced a Multipurpose Card for electronic identification as part of their ICT strategy, to reduce the incidence of fraud.
- Malaysia has also included in its strategy the creation of an International Cyber Court of Justice
- Ireland looks to access for disadvantaged persons, especially those with disabilities.

