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Readiness for the Networked World: Jamaica Assessment

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Jamaica Assessment

by Rohan Kariyawasam

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Berkman Center for Internet & Society, Harvard Law School[1]

[1] This assessment is based on the *E-Readiness* template developed by the Information Technologies Group, The Center for International Development, Harvard University.

Acknowledgements

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About the Author

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Research Methodology

This readiness assessment is based on a methodology developed by the Information Technologies Group[2] at the Center for International Development at Harvard University. **Although the *Readiness for the Networked World*[3] methodology is used as a framework for this study, the Author has gone one step further by including key messages in audio format from the very people concerned with ICT development in the field in Jamaica from teachers, industry figures, Ministry officials, to the Office of the Prime Minister (see pages 7-18 for the multimedia component).**

The Readiness for the Networked World methodology aims at assessing the status of information and communication technologies (ICTs) in a developing country in order to evaluate the preparedness of this country or region to compete in the information economy.

What is *Readiness*?

> *Readiness is the degree to which a community is prepared to participate in the Networked World. It is gauged by assessing a community's relative advancement in the areas that are most critical for ICT adoption and the most important applications of ICTs. When considered together in the context of a strategic planning dialogue, an assessment based on these elements provides a robust portrayal of a community's Readiness. The value to a community of assessing its Readiness lies in evaluating its unique opportunities and challenges.* (Readiness for the Networked World, www.readinessguide.org).

As a guide for understanding ICTs and development, this methodology looks at the ICT environment through five lenses:

> **Networked Policy:** By looking at Trade Policy and the Telecommunications Regulatory Environment this category helps to determine whether the national policy facilitates and fosters ICT development in the country or region.
>
> **Networked Access:** This category looks at indicators such as Information Infrastructure, Internet Availability, Internet Affordability, Network Speed and Quality, Software and Hardware, and Service and Support in order to build an understanding of the relative ease and quality of access to IT and the Internet.
>
> **Networked Learning:** How has ICT been used and applied in the learning environment by students and teachers throughout primary, secondary and tertiary education? What is the quality and supply of the labor force trained in ICT?
>
> **Networked Economy:** How advanced is the use of the Internet for business-to-business and business-to-consumer electronic commerce? Moreover, how has the government adopted the use of IT for government citizen services and procurement?
>
> **Networked Society:** How intensively is ICT integrated in everyday life? Are there significant opportunities available for those with ICT skills? What is the quantity and quality of local content? How are people and organizations utilizing ICT?

These various categories will provide the framework to portray a complete and comprehensive picture of the ICT environment in a developing region.

[2] www.cid.harvard.edu/ciditg
[3] www.readinessguide.org

Data and Information Gathering

Hard data was collected from the Internet, and country reports and documents produced by international organizations and funding agencies. The qualitative contribution of this study is based on unstructured interviews conducted with over 24 organisations and around fifty people from the private and public sector and non-governmental organizations (Please see Appendix D for a full list of interviewees).

Further information about Jamaica may be found through the list of websites included in Appendix B. All financial figures listed in this report are in US dollars or Jamaican dollars. The exchange rate uses a 46 Jamaican dollars = 1 USD conversion rate, which was the exchange rate in February 2002 (unless otherwise mentioned).

Executive Summary, Recommendations and Audio Extracts

This report is an assessment of the status of ICTs in Jamaica, which attempts to analyze obstacles and impediments to ICT development in the country. A set of recommended actions and policies are also presented here including key messages in audio format from those working at the cutting edge of ICT development in Jamaica.

The assessment is structured as follows:

- Executive Summary, Observations, Recommendations and Audio Extracts
- Presentation of Jamaica's national background.
- Description of Jamaica's telecommunications policy and ICT trade policy
- Analysis of whether these policies facilitate or obstruct ICT development in Jamaica.

The body of the report is further structured into sections based on this methodology:

1. Network Policy
2. Network Access
3. Networked Learning
4. Networked Society; and
5. Networked Economy

Each section is categorized into stages (1 to 4), stage 1 corresponding to the lowest level of e-readiness, and stage 4 the highest. The last part of the report presents the main findings. The main conclusion of the assessment points to the fact that Jamaica is in a highly transistional stage with regards to being ready for the networked world. Rural Jamaica oscillates between stage 1 and stage 2, while urban Jamaica oscillates between stage 2 and stage 3 depending on which indicator is under study.

The Executive Summary follows together with observations, recommendations, and audio interview extracts (pages 8-18).

[4] www.readinessguide.org

EXECUTIVE SUMMARY

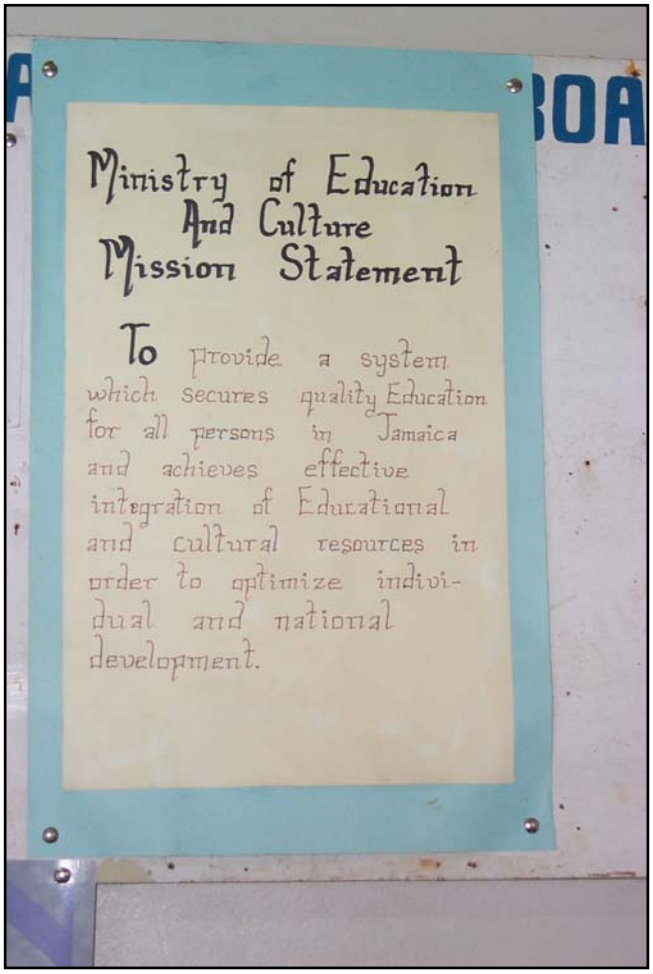
Category	Stage	Description
Network Policy	**3**	The Telecommunications Act 2000 allows for a three- phase transition towards a fully liberalised market, although other parts of the Act also restrict the international bypass of C&WJ's international network. The Act gives authority to the newly created Office of Utilities Regulation to regulate not only the incumbent but also the new entrants to the market. The first phase of liberalization was completed with the signing of a Heads of Agreement with C&WJ in September 1999, allowing for an end to the monopoly of C&WJ. At present 29 licenses have been issued since Phase II began in September 2001. Phase III is scheduled to commence in March 2003, when C&W's last monopoloy industry, international services, will become fully deregulated and open to competition, although the GOJ is known to want to bring this date forward. There are no trade barriers for the import of ICT equipment in both hardware and software into Jamaica. CPE equipment has been fully liberalized. In January 2001, the GOJ published a five year IT strategic plan in which it sets out its vision for facilitating the use of ICTs in Jamaica. This year, the government is set to release a draft E-Commerce Policy, which will include plans to introduce digital signature and privacy laws, laws on computer misuse, and laws for consumer protection
Network Access	**2-3**	Access to telecommunications infrastructure is generally good in most urban centers with a national teledensity of 23 lines per 100 people (500,000 fixed lines in total). However,rural parishes are not served nearly as well by the incumbent as urban parishes with longer wait times for fixed-line access. The number of mobile subscribers is estimated at 475,000 meaning that mobile penetration will at some point soon overtake fixed-line penetration. Only C&W and Infochannel currently have points of presence in each of the Jamaican parishes. There are 22 licensed ISPs in Jamaica with 15 of them currently operational. The total number of subscribers is estimated to be around 150,000, although many users share accounts. With the high level of competition in Jamaica for internet service provision, prices for internet access are in line with OECD rates. However, the above cost of leased-line provision is still continuing to inflate both access and usage prices.
Networked Learning	**2-3**	Computers are found at the university, secondary, and primary school level. Equipment tends to be fairly new, particularly at the university level. Networked labs get Internet connectivity through a dial-up connection to the Internet. Computers are available in 170 out of 250 high schools throughout Jamaica and are used mostly to support traditional work and study. Teachers use computers for word processing and potentially some research on the Internet. There are limited opportunities for training in ICT in rural areas, although the urban communities are served well. A range of tertiary institutions offer courses in high-end programming graduating around 250 students per year.
Networked Society	**2-3**	According to Infochannel, a leading Jamaican Internet service provider, the number of users in Jamaica is estimated at around 150,000 maximum, although only around 80,000 have actual internet accounts. The age range of internet users is estimated to be between 22 to 45 years of age, with 45% of the user population being men and 55% women. There are fewer than two domains registered per 1000 inhabitants[5]. To date the Postal Corporation of Jamaica has received $31M from the INTEC Fund, which has enabled the Corporation to refurbish 44 post offices and to equip these offices for IT-based commercial services. Cable and Wireless has offered to place Internet Kiosks in 60 post offices, of which 26 to-date are able to offer Internet and email services.
Networked Economy	**1-3**	In urban Jamaica, there is a vibrant market for the employment of ICT professionals, particularly given the downturn in the US market and the slowdown in engineers moving abroad. The government has been successful in creating over 4000 jobs through the Information Technology Project (INTEC) in the last two years. In rural Jamaica, very few businesses in the community operate websites. There is little awareness of online business and most dealings between businesses and consumers consist of oral and/or paper based transactions. Also there are few government resources online. There is little awareness of e-government, and all dealings between government and citizens or businesses are in person or paper based. However the situation is beginning to change with IICD-led projects in agriculture and farming.

[5] *Ibid.*

Exec Summary Cont: Observations, Recommendations, and Audio Extracts

In drafting this report, the Author has made the following observations:

1. ICTs cannot be introduced into a community with the expectation that the community will immediately adopt them. For example, many schools in Jamaica have benefited from the introduction of computers, but without adequate teacher training in the use of the computers and also good access given to the children, the computer lab either becomes a place that is kept under lock and key or quickly deteriorates due to a lack of appreciation for the importance of maintenance. Therefore it is imperative that funding is targeted at tertiary institutions of learning that are equipped to train teachers in the use of ICT in the curriculum.



Mission statement of the Ministry of Education

2. The use of small-scale pilot projects to help inform later and larger projects has been very useful in Jamaica. For example, introducing a pilot project in a particular area also encourages other infrastructure requirements and systems that are going to be demanded by the pilot and which will make it successful. In this way, the pilot becomes a catalyst for change. Well thought through ICT projects that take into account the needs of the community and the user interface are forcing both investors and the local community to think about the development of other systems that first need to be put in place before the pilot can succeed. This need to understand the requirements of end-users on the ground was the important lesson arising from putting in place a system of e-government in Portmore and funded by the Netherlands based development NGO, the IICD. However, all the successful ICT projects in Jamaica including music, educational learning, e-government, agriculture, improving business efficiency have had at their core one important principle; *the need first to identify the local demand and satisfy that local demand before building out complicated IT systems*. ICTs need to be understood in the context of everyday life, and the success of the take-up of ICTs will very much depend on how readily the technical people can satisfy the local demand for service.

3. Development assistance need not be restricted to NGOs or purely government-funded projects. Sometimes funding through government organs can lead to a lack of efficiency at best or outright corruption at worst. And yet a small amount of technical assistance provided directly to well thought through commercial pilot programs can lead to dramatic improvements in working practices for small businesses nationwide. For example, the USAID-funded *New Economy Project* is involved in providing technical assistance and management consultancy to a number of commercial entities in Jamaica that

are specifically involved in helping improve the *business processes* of smaller Jamaican SMEs. In one case, the NEP has been working with a private company called Management Control Systems (MCS.com) to provide on-line payroll and tax services to small companies that do have the resources to produce their own payroll records, wage slips and tax returns. The project is expected to serve a projected market of around 2000 to 2500 firms in Jamaica. In other words for an initial investment of US$90,000, the NEP can potentially deliver benefits to over 2000 Jamaican firms.

View of "uptown" Kingston, where many technology businesses are located

In another project, the NEP has been working with the Jamaican Stock Exchange to automate their process for trading in fixed-income securities (T Bills). At present T Bills are traded over the counter, with transactions being oral and paper based. The stock exchange now wants the fixed-income market to be set up in the form of a central depository where all the existing paper is collected and dematerialized (physical pieces of paper exchanged for a record in a computer system) thus removing the time required to exchange paper because the time to trade the security is now the equivalent of transacting on a computer system. By networking the settlements trading engine with the Bank of Jamaica, accounts for all registered brokers can be cleared and netted-off, and settled in a day (as opposed to a minimum of five days with the paper-based system). The NEP is investing US$115,000 in the form of technical consultancy and management expertise with the Stock Exchange investing US$600-700,000. The idea is that with a centralized depository for T bills, a solid central bank, and a system of fair legal trading (a good Companies Act and Securities Act), the volume of transactions will greatly increase, as Jamaica becomes increasingly attractive to pension funds offshore (particularly given recent events in the US with Enron and Proctor & Gamble)[6].

Historically the Banking industry has been reluctant to get involved in e-commerce in Jamaica. For banks in Jamaica to use any sort of e-payment service, they have to use third party software (generally from the US), which often means paying prohibitive license fees. Given that the number of internet subscribers is currently estimated to be around 150,000[7], the costs for putting in place e-processing gateways do not match the benefits, and very few of the banks' business clients are demanding this kind of service. One way the government can accelerate the take-up of e-commerce in the B2B sector would be to fund the development of *Open Source* software for an e-payment service and e-processing gateway. As a condition of the Open Source license, any local bank that was to then improve on the source code by investing in locally funded programming support would have to share the code with other banks. Initial funding for developing the code could come from one of the regional development banks, such as the Caribbean Development Bank for example, as the code could benefit a number of banks in the Caribbean basin. However it should be noted that there are many different types of open source license, and not all include the provisions mentioned above. The GNU GPL license does have such provisions, but GNU would more likely describe their philosophy as being "Free Software" as opposed to "Open Source". The license the FreeBSD operating system is developed under, however, does not require anyone to share what has been built on top of FreeBSD - hence Apple's ability to use FreeBSD as the basis of its OS X and still keep its source closed.

[6] However it should be stressed that in both NEP projects listed here, the numbers cited are just the assistance delivered to the client. The overhead costs were very high with roughly $1-$2 spent for every $1 delivered to the client

[7] Source: Interview with Patrick Terralonge, Managing Director, Infochannel (ISP), February 2000.

International Aid Organisations: Time and time again, the Author has heard criticisms of the work of the International aid organizations. The perception on the ground appears to be that very little actual development is taking place. In fact there is an outflow of capital to buy hardware and software from international vendors, and usually from the US.

International aid organizations must rework their models to take into account the real demands of local communities in developing countries, in a similar way to how the IICD is pioneering international development through the use of small pilot projects which help to inform larger projects so that there is less likelihood of dramatic failure when scaling-up. The WorldBank and other multilateral agencies need to adopt similar approaches in the use of pilots to avoid a great deal of overlap and unnecessary wastage of vital funds.

Many NGOs complain that what is fundamentally wrong with the approach of the funding agencies is that the agencies are not *integrally involved* with the local communities that they are supposed to help. There is a lack of a scientific systematic approach to development. It is more of a political approach, and yet the determining factor remains the need for development on the ground, and also monitoring the failures. Without knowing what went wrong, it's difficult to improve for the future, the NGOs argue.

Lessons from education: what are the lessons to be learnt from trying to implement ICT projects in local communities? Dr Ventura, Marcia Blair, and Colin Lee (shown in picture to left), ICT advisors to the Office of the Prime Minister, explain. Click to hear the audiofile (5 minutes): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=OPMCommunitybasedICTsExtract.rm

As a possible solution in Jamaica, targeted funding by the international agencies towards smaller scale pilots that are already being implemented by local communities could lead to much better results. However the flip side to this argument is that *sustainability* often is a problem with community-led projects, which is why such projects often find it hard to get the international support they need. In many instances, the projects fail to demonstrate a way of making itself sustainable, often because there is a lack of commercial or economic thinking behind the idea.

Clearly what is required is a form of "middle ground", where international donors spend more time and resources in finding ways to become more integrally involved with local communities by flagging community-led projects that are worth supporting, and working hard to assist such projects in achieving sustainability by resourcing them with first-world project management and planning skills. The perception is that no one country developed or developing has all the answers in the use of ICTs, and that conditions will be different in developing and developed countries. It's a learning process, and the aid organizations must come with the idea of learning. If they fail to do this, then they are likely to loose large sums of money.

3. Donor funding:

- **Funding Mechanisms:** Providing direct funding to projects is seen as a means of opening doors to corruption. Donors are encouraged to supply tangible assets, such as books, computers, training, and technical assistance rather than direct financial compensation. Also the present trend of using three-year funding cycles does not allow sufficient time for some projects to be implemented and to start to perform. Longer time periods are required although this principle may not necessarily apply to all projects. For example, reasonably managed projects should be able to demonstrate progress and some results in a year or less, even if the progress is of an interim nature. Having met some of the measurable objectives, projects can then move on to the next phase. This is particularly true of ICT-led projects where the technology moves so fast, where what made sense in the proposal-planning phase has little relevance two or three years later. However this may be less true of agriculture, education, or environmentally led projects, where the developmental cycles might be longer.

- **Evaluation and Follow-up:** Since Jamaica depends heavily on donor funding, donors play a major role in influencing the country's economy. Throughout the interviews, many donors were criticized for not evaluating or following up on projects. Funding is supplied for a specified period of time and then the donor stops its contribution, dooming the project to failure since no mechanisms to ensure sustainability of the projects were put in place. Again this is an area where a good pilot can inform a larger project. Donors can first evaluate the performance of the pilot and then pick up on those pilots they wish to see turned into full-scale projects with the benefit of any lessons learnt from the pilot itself.

- **Training supplied with donor funding:** Internationally funded projects, which incorporate personal computers should allocate a component for *training* personnel on the use of these contributed computers, and for the *software applications* that will be used on these computers. It is unfortunately for example that the once successful Jamaica 2000 Foundation has had to streamline its operations due to a cut in funding from the Ministry of Education.

- **Lack of Information:** There are a few resources on business planning and local market information in Jamaica. The information marketplace needs to be made richer by enabling small businesses with limited access to get information on how to thrive in Jamaica easily (eg following the format of Dellbiz.com, where there's a wealth of information on business planning tools). Jamaica does not have a Dellbiz.com because there are not enough big producers or market players wanting to share this kind of information freely. The GoJ and JAMPRO should enable business information to be made available freely, making the information market richer and deeper by using inexpensive web-based channels to deliver business development services to many more SMEs. In this respect, small companies tend not to be sufficiently supported in Jamaica.

II. Network Policy

As a major part of generating confidence, the GOJ is planning to introduce digital signature and privacy laws, laws on computer misuse, and laws for consumer protection (with the GOJ encouraging the private sector to adopt self-regulatory mechanisms and codes of practice in electronic government). To achieve this, the government has expended considerable resources in hiring foreign consultants to advise on the regulatory regime and to conduct an audit of existing legislation.

The Government needs to be careful in not expending considerable resources in time and money in overhauling the current legislative framework. For example, the legislative process in Jamaica can take up to three years for the approval and bringing into force of new legislation. The fear is that to wait for new legislation could slow down the take-up of e-commerce. An alternative would be to focus on *policy* and make it politically acceptable for government agencies to conduct electronic business in the hope that commercial businesses will follow, a case of government leading by example. The caveat would off course be in consumer protection. In Jamaica, it

is very much the case of *consumer beware,* and as mentioned above, the GOJ is actively planning to introduce new laws to protect the consumer, which is to be applauded, as at present, the people and businesses using e-commerce are using a number of procedural "work arounds" which enable compliance with legislation at reduced "business risk". Many of these businesses are adopting standards and approaches which are accepted in the US and Europe. However data security and privacy will emerge as major issues.

Restructuring: If government had $100,000 what should it invest in, law or policy? Should government invest heavily in reforming its current regulatory framework to facilitate e-commerce or should it lead by example, by setting policy? Click here to hear Gary Vanderhoof, advisor to the USAID funded NGO, the New Economy Project (5 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=NEPPolicyExtract.rm

Jamaica has been very forward-looking in not only designing a national ICT policy and strategy (specifically the Five Year Strategic Information Technology Plan), which the MICT is careful to describe as a framework document, but also by actively building awareness of this policy. However, the main problem is that the plan remains very broad and is in danger of losing direction. The plan lacks specific implementation timetables with detailed prioritized items, budget outlines, and the reasons for the priorities set out. Also, to truly move ahead, the GOJ will have to overcome confusion within its own culture as to understanding what ICT promotion really means. For example, there is a political mandate to create jobs (40,000 in three years), which can create confusion between *job generation* and *industry IT promotion*. To-date, the only area where this has been bridged successfully is in telecommunications. In this sector, the Government did three things; it opened the environment, changed policy and enabled foreign investment by introducing competition viz the two mobile operators Centennial, Digicel, and the ISP, Infochannel (now in competition to C&W in introducing ADSL to Jamaica). A similar approach by the Government now needs to be taken with the e-commerce sector, particularly when it involves its own service delivery. Best practice suggests that government should use market-enhancing mechanisms, such as licensing and regulatory reform, outsourcing and commercial partnerships to foster innovation rather than subsidized credit for example. The caveat to this would be in education and human resource development.

Some specific recommendations:

- **There is a lack of interface between business and government:** The Government-Business interface needs to be better enabled through technology specifically by reducing the *business costs for compliance*. For example in Canada, the business passport (IT business passport) enables a business to provide information needed by the government at a single point of entry. Singapore has a similar concept. In Jamaica, JAMPRO despite its best efforts has failed to achieve this, and businesses still need to go to four or five different governmental agency points to pay taxes and obtain licenses. For large businesses who have the resources, the need to provide many different pieces of information and forms is not so much of a problem, but trade is not facilitated for smaller businesses who do not have the resources to deal with taxes, licensing, government forms, cutting managers cheques for tariffs etc. JAMPRO needs to get a single point of presence for services set up. To its credit however, JAMPRO has been very successful in publishing a range of export documentation on-line and to setting up a B2C/B2B virtual trading site as part of the UNDP's funded Tradepoint programme.

- **Media Training**: There should be a specific effort to train the media on IT in order to better grasp the issues, and to present and disseminate these issues and knowledge to the public more effectively. To achieve this, perhaps the government should consider funding a closer collaborative working relationship between the radio DJs and TV producers of Jamaica with the Office of the Prime Minister's advisers on IT, and the MICT. The relationship could be focused around current live ICT projects and how they benefit the local communities they are meant to serve.

- **Universal service:** At present, there is no universal service access obligation on C&W to provide schools with sufficient access. The GOJ has not yet defined a Universal Service Obligation (USO) for schools in legislation, but in any redrafting of law/policy, such an obligation might become increasingly relevant. Also, any new legislation might call for telephone access to include a basic form of internet access. There is a draft framework policy to include adequate telecoms support in particular sectors such as health and education. The GOJ is also considering whether certain minimum technical standards need to be set to

provide service to remote schools, and this needs to be agreed as a matter of priority to ensure that rural Jamaica keeps pace with urban Jamaica as a *de minimis* principle.

III. Network Access

Most primary and secondary schools have access to the internet, although the data rates offered vary greatly from 14Kbps to 56Kbps. Also, students are charged for time to access the net to help subsidise the school's fees to the ISP (internet access charge) and to C&W (telephone line charge), although we understand that at the time of writing, the Ministry of Education will shortly be making available cash grants to a number of schools to partially cover the cost of internet access. Prior to the Ministry helping with funding, the responsibility for bills fell squarely on the school, which has resulted in a number of school's ISP accounts being closed due to bad debt. C&W to its credit does offer a product specifically targeted towards schools called *Classmate*, which it claims to offer to 400 primary and secondary schools in Jamaica. The product provides a 50% discount on internet rates.

Access to telecommunications infrastructure is generally good in most urban centers with a national teledensity of 23 lines per 100 people (500,000 fixed lines in total). However, the number of mobile subscribers is estimated at 475,000 meaning that mobile penetration will at some point soon overtake fixed-line penetration.

With the high level of competition in Jamaica for internet service provision, prices are in line with OECD rates. However, the above cost of leased-line provision is still continuing to maintain prices higher than they would ordinarily be. Under the Telecommunications Act 2000, the Government has opened up the leased-line market to competitive service provision, but at the time of writing, no operator had yet entered the market in competition with C&WJ.

Specific recommendations:

- The legislation is in place for competitive leased-line service provision and yet no operators are competing with C&WJ. The government may want to examine cheaper alternatives to fixed-line infrastructure, particularly in dense urban areas, where there might be a possibility of setting-up microwave networks to serve customers, mainly corporate with dedicated point to point wireless services. At the time of writing, one ISP, N5 has been issued with a MMDS (microwave network carrier) license, but it is not entirely clear why the number of licenses issued was restricted solely to N5.
- At the time of writing, C&W is in the process of agreeing a cost-based accounting system with the Office of Utility Regulation that will lead to C&W tariffs being more closely aligned to cost. This process needs to happen quickly, and an accurate system for cost-based accounting arrived at, otherwise the market will continue to experience inflated tariffs, maintaining inflated consumer charges. A move to cost-based pricing will more than likely have a dramatic effect on the leased-line market, making the prospect of a dedicated leased-line more affordable to SMEs, although C&W would also argue that a move towards cost-based pricing will also lead to a likely increase in the cost of domestic rates.

IV. Networked Learning

- **Information technology**. Schools and colleges should be encouraged by the Ministry of Education to work closely with the leading ISPs, particularly C&WJ and Infochannel to develop more bulletin boards and information resource sites targeted at the needs of local communities. One way, that schools can raise extra funding would be to use their computer labs for commercial gain outside of normal school hours by providing printing services for the local community for example; Easter cards, Christmas cards, simple posters and flyers could all be produced with the use of a PC and a printer. Additional services could include the IT teachers receiving a cash incentive for training members of the local public out of school hours in the use of Microsoft applications such as Word, Access, Excel, and powerpoint. ISPs should also be encouraged to provide discounted hosting rates to schools for the hosting of school websites. In this way, through its

website, a school can reach out to past alumni for fundraising appeals, and to the wider community for grants and scholarships.

- **Computers in Schools:** The Ministry of Education needs to forge ahead with its plan to integrate schools and colleges onto an intranet. In this way, the Ministry will be able to track more accurately the training needs of teachers at schools across the country, and therefore the funding requirements for training.

Staff and students at Spauldings Primary School

- **Distance Education:** UWI has pioneered the concept of distance learning. Since 1983, there has been a distance teaching facility at UWI that uses audio and video-conferencing. The UWI is a regional university (only two of them in the world, UWI and the University of South Pacific), that is funded by 14 governments. There is now a UWI distance-teaching center located at the Mona campus. Each campus country has a nodal point. There are hubs on each of the three main campuses (Jamaica, Barbados, Trinidad and Tobago), which radiate out using fixed digital line technology to 36 sites (in Jamaica there are 12 sites). Throughout the Eastern Caribbean there are twenty-three sites, and in Trinidad and Tobago (five sites), and also sites in Belize, Grand Cayman, and the Cacos Islands. There are a number of different programs delivered to the different sites, and each center has a resident tutor. The distance-learning network is well patronized with content consisting mainly of audio together with a small amount of time-delayed video. There is also material that is posted on a common website. UWI uses Virtual U and Web CT products, and the University library is also on-line. Much can be learnt from UWI's approach to distance learning, for example, that the use of video does not necessarily enhance the text a great deal or that sometimes, distance-learning courses can become very impersonal. To get around this problem, UWI has been collecting pictures of students, asking students to inform the faculty of their birthdays, and also building into the course, material on stress management, time management, and on-line study skills. One of the biggest problems to overcome is that many students are not proficient in the use of a computer, and sometimes it is the students' own children who are actually inputting the material on behalf of their parents (maybe as high as 20% of student numbers). It has therefore become a prerequisite that all students have some form of computer literacy before registering on the course.

- **Human Resource Development**: The brain drain created by the movement of people trained in ICT from Jamaica mainly to the US and Europe damages Jamaica's development efforts. The government needs to create incentives for people to stay in Jamaica to benefit the development of the country. One way of achieving this is to invest further in programs such as the University of Technology's Innovation Center (TIC), which provides technical and business support to entrepreneurial start-ups. The TIC has been on the University of Technology campus since 1987 and targets start-ups and new businesses. However the TIC is only beginning to develop the expertise required to assist SMEs in finding access to good credit and venture capital. Technical expertise is on hand through mentoring programs with experienced industry figures together with access to the technical facilities of the University of Technology, which includes the high speed Local Area Network and VoIP CPE equipment. An injection of funds from an international donor or a development bank, however, could help the TIC scale-up from the 29 start-ups that it currently supports to well over 50. Another way to enable retention would be to inject funds into a venture capital fund and to hire professionals skilled in the use of intellectual property to help protect design ideas and business innovation developed locally.

Specific Recommendations:

- **Education:** The greatest disadvantage is that many of the very experienced educators are not proficient in the use of a computer. A crucial step would be to see funding directed at institutions similar in nature to the Jamaica 2000 Foundation that are in a position to train educators in the use of technology. The Foundation has a tremendous amount of experience in putting in place local computer networks in schools and also a valuable database comparing the performance of educational software packages worldwide. Furthermore, the HEART Trust, which is responsible for vocational training in Jamaica, is at the point where it has established a number of computer training labs in each of its centers, but must now address the critical problem of training a sufficient number of instructors in the use of ICTs.

Students at the Montego Bay Community College, one of the larger vocational colleges in Jamaica training students in ICT skills, and funded by the HEART Trust

A good model for development is again found at the University of West Indies, where the faculty there had to create the right conditions for using technology in the curriculum. The faculty responsible for educating the educators learnt that *if information technology is being used to solve a real problem, then it develops the motive and the dynamic to do it. The infrastructure required to solve the problem simply follows suit.* In short, that ***the IT policies that need to be developed emerge from the issues that need to be resolved***. They also discovered the need to avoid a form of centralized top-down policy making which stifled creativity and experimentation. The faculty is now exploring new ideas as to how teaching might be enriched with multimedia sources. For example, presentational tools used within the classroom environment include videocameras, laptop computers with powerpoint, videotapes and DVDs.

Professor Errol Miller from the University of the West Indies describing the past and his vision for the future use of technology in classrooms. Click to hear (4 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=UWINetworkedLearningExtract.rm

- **Problems with cost**. A major problem for teaching institutions is their inability to get access to US or Canadian *academic licenses* for software from outside of the US and Canada. If the public bodies responsible for the teaching institutions in Jamaica were to negotiate on behalf of local Jamaican schools and colleges as a collective with US or Canadian publishers, access to academic licenses might be easier, but by no means guaranteed. As Frederick Douglass said 100 years ago, "*power does not concede anything without demand*". Those who have the advantage are going to keep it.

- **Access**. The Jamaica 2000 Foundation has been successful in putting computer labs into many primary and secondary schools throughout Jamaica. But access to these labs by the many hundreds of children trying to share perhaps ten to fifteen computers per lab is a serious problem. Although there is now a focus to bring the technology more into the classroom (through laptops, computers on trolleys etc), the problem of access remains. Many of these schools have only one telephone line with access to the internet being available on average from one or two terminals, usually located in the school's library. It is vitally important that Jamaica as a country addresses the issue of access to either fixed or wireless infrastructure and at a reasonable level of bandwidth. C&W has a number of specialized packages that it offers schools (eg

Classmate), as does its leading competitor, Infochannel. Perhaps, the government's intention to bring forward the date for the liberalization of international services, currently an exclusive monopoly of C&W until March 2003 will act as a catalyst for other needs, such as school's access to fixed-line infrastructure and a minimum level of service for internet provision.

- **Local Content.** The Jamaican Gleaner has been very proactive in trying to create parish-specific sites that advertise content particular to that parish, for example Go-Portmore, Go-MontegoBay, Go-Portland etc. At the time of writing we understand that four or five sites have been set up. These initiatives need to be encouraged and cross-advertised by the existing and larger ISPs, such as InfoChannel and C&W to ensure that the existence of local content is made available to a wider public.

V. Networked Society

- **The Workforce:** In Jamaica, women tend to be better educated on average than men. Approximately 67% of the civil service is composed of female employees[8], and at the University of West Indies for example, the male to female student ratio across all faculties is a staggering 30:70 (the faculty staff ratio being quite the opposite at 60:40)[9]. The Ministry of Education needs to be careful to ensure that the work force remains relatively balanced with young males choosing to remain in education to pursue academic qualifications as opposed to leaving school early to work. Only in this way can spiraling crime be checked and a belief in identity strengthened. How this can be achieved is a tremendously difficult problem to solve as it has a strong cultural foundation. Whatever the method chosen, the solution, or range of solutions has to start early in the developmental process, perhaps as early as primary school education. The Ministry of Education needs to examine carefully its early intervention programs, possibly using technology at the earlier stages of education to encourage more males to stay on? For example, the Ministry of Education could work closely with the music industry and local radio to develop educational programs to target young males.

- **Sustainability of Internet kiosks/cybercafes:** Kiosks and cybercafes can be used as a tool to disseminate information regarding local community issues, government services, taxes etc. Centers in more rural areas could simply be information kiosks. To date the Postal Corporation of Jamaica has received $31M from the INTEC Fund. This grant has enabled the Corporation to refurbish 44 post offices and to equip these offices for IT-based commercial services. Cable and Wireless has offered to place Internet Kiosks in 60 post offices, of which 26 currently are able to offer Internet and email services. C&WJ has the exclusive contract for the provisioning of these kiosks, and pressure must be bought to bear by the government to ensure that C&W completes the contract as quickly as possible. Also other operators, such as Infochannel should be given the opportunity to compete for infrastructure-based tenders in the future.

- **IT for Awareness:** most communication in Jamaica is either paper based or oral. To improve this situation, the government's plan to have every Jamaican citizen have an e-mail address by year end 2002 should be pursued resolutely. At the same time, the PostCorp of Jamaica is planning to introduce a service to assign e-mail addresses to post office customers. Under this plan the post office could be authorized to download e-mail messages and place them in envelopes for customers in cases where customers do not wish to use the facility themselves. A public awareness campaign should be organized through local radio (the music DJs being very powerful in Jamaica as influencers of public opinion) to introduce the general public to e-mail service provision, particularly through the post office.

VI. Networked Economy

- **Banks:** Banks are not yet offering services to allow for on-line transactions. Only a few banks are accepting on-line payments; their websites are mainly overseas and they have arrangements overseas to

7 Interview with InfoChannel, February 2002
9 Interview with the University of West Indies, February 2002.

collect/process credit card payments. Banks have yet to take up the challenge to develop e-commerce, and unfortunately, many of the local Jamaican banks are unwilling to take the risks associated with transacting over networks. At present, there is some instability in financial institutions, as many of the banks that existed in the late 90s are now no longer around. As a result, banks are somewhat risk averse. The foreign banks by contrast have been a little more aggressive in approaching e-commerce, for example, the Bank of Nova Scotia has announced that it will provide e-commerce services (as well as Citibank). The conservative approach to e-commerce within Jamaican financial institutions is more of a cultural issue than a financial one.

- **Debt:** Continued control over fiscal policies has helped slow inflation-although inflationary pressures are still mounting. High government debt, which is pushing local interest rates to higher and higher levels is making it difficult for local borrowers to capture the funds needed for entrepenurial investment. Also increased foreign competition (Jamaica has faced some serious dumping issues from the US particularly in previously protected industries such as dairy products and agriculture), has increased the number of companies going into receivership or liquidation. The government needs to help smaller entrepreneurs to gain access to good quality credit and at affordable interest rates. It also needs to encourage a move in investment portfolios away from non-productive, short-term high yield instruments, to longer-term lower yield instruments, and work with development banks to create a venture capital industry. However greater SME lending and venture capital is not going to be the only panacea for stimulating Jamaican entrepreneurship. Experts in the first world would argue that it is not necessarily the cost of capital that is holding back greater e-commerce in developing or transistional nations, it is also the *commercial viability* of the concepts ventured. There is no doubt that SME borrowing is expensive in Jamaica, but this situation is not necessarily different in other parts of the world as well, particularly for internet start-ups. Developed markets suggest e-commerce concepts are good additions to other distribution channels, and that e-business is about a lot more than just e-commerce. Really viable ideas and competent teams can raise money or "boot-strap" their way into the marketplace.

- **Governance:** Government ministries can provide a model for ICT development in Jamaica by enforcing standards among ministries. For example it is our understanding that the Contractor General's office now wants all contractors for government contracts to go through a selection process. A step for improving governance therefore would be to post all request for tenders on a single government portal site and make it a condition that all tenders in response be submitted directly over the web.

Areas of Further Research

The following are proposed areas for further research:

- **Business-to-Business Commerce:** Several sectors appear to show promise in business-to-business commerce opportunities, particularly in music and tourism. The government could also examine how regional trade can be enhanced through trade agreements with other Caribbean-basin countries. A priority would be to determine the *digital trade interests* within Jamaica that are worth exporting and which digital products and service industries should be financed and encouraged.

- **IT and Health:** The connection between IT and health for use at the national, provincial and district level requires further study and deeper understanding The country must also develop an understanding of how to build a national IT health strategy tailored to Jamaica's needs.

- **Foreign Direct Investment:** The government should examine new models for creating innovation within the ICT sector, and ways in which it can generate a more vibrant venture capital funding industry. New partnership arrangements should be examined between local Jamaican banks, the regional development banks, and the multilateral funding agencies to examine innovative financial instruments, venture capital, and micro loan credits that will stimulate innovation.

- **Technology Transfer:** Further investigation is required to identify what areas and markets could be explored for technology transfer.

- **Pace of Networking:** Further detailed quantitative research needs to be done in the field to assess actual technology adoption by SMEs, for example on the number of computers at SME employee workstations and how many have internet accounts, whether or not PC sales are increasing, whether or not the sales of productivity applications like ACCPAC or MS Office are increasing, and SME owner/manager attitudes towards technology investments and training

Rays of Hope

The Author presents here extracts of radio interviews in RealPlayer format[10] with selected key people in schools, government, NGOs, and business that offers hope for the future of Jamaica. The idea of these sound clips is to communicate the unique message that each of these people, knowledgeable in their own areas, would like to give to you the reader to help bring meaningful change in Jamaica through the use of ICTs.

1. Schools and Colleges:
    a. Message from Professor Errol Miller, Faculty of Graduate Education, University of West Indies on the powerful symbol of Information Technology in Jamaica (5 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=UWIConclusionExtract.rm
    b. Message from Avril Crawford Executive Secretary, Jamaica 2000 Foundation on training teachers and avoiding pipe dreams (37 seconds)): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=AvrilCrawfordInterview.rm

2. Government:
    a. Message from Camella Rhone, Director General, Ministry of Industry Commerce and Technology on what keeps her motivated in overcoming the hurdles in the use of ICTs in Jamaican society: the creativity of the Jamaican people and the future direction of government (2 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=MICTConclusionExtract.rm
    b. Message from Dr Arnoldo Ventura, advisor on ICTs to the Office of the Prime Minister on ICTs in international development (4 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=OPMConclusionExtract.rm

3. NGOs:
    a. Message from Gary Vanderhoof, advisor, New Economy Project, on the most critical responsibilities of government with regard to ICTs (5 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=NEPConclusionExtract.rm

4. Business:
    a. Message from Patrick Terralonge, Managing Director, Infochannel (second largest ISP in Jamaica) on the Jamaican "Virtual Nation" and regulatory reform (2 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=InfochannelConclusionExtract.rm
    b. Message from Jim Beneda, Managing Director, Centennial Ja (Mobile carrier) to government on new entrant access in the telecoms and internet industries (3 mins): http://cyber.law.harvard.edu/scripts/rammaker.asp?s=cyber&dir=jamaica&file=CentennialJaConclusionExtract.rm

All interview extracts are based on full interviews completed in February 2002.

[10] To access and play the audio files, readers can download the *RealPlayer 8* player for free by clicking here: http://download.com.com/3000-2378-2527233.html?legacy=cnet. Please allow a few seconds for the files to load.

National Background

Source: http://geography.about.com/library/cia/ncjamaica.htm

Jamaica is an island in the Caribbean sea, south of Cuba, and occupies a strategic location between the Cayman Trench and Jamaica Channel, the main sea lanes for the Panama Canal. English is the official language although many Jamaicans also speak Creole. Black Africans account for over 90% of the population with East Indian 1.5%, white 0.2%, Chinese 0.2%, mixed 7.3%, and other 0.1%[15]. Its population of just over 2.65 million[16] inhabits a surface area of 10, 990 sq km. Jamaica has a wide array of religious denominations, most of which center around Christianity with Protestants by far occupying the largest group (61.3%), Roman Catholics (4%), others including some spiritual cults (34.7%).

Politics

Jamaica gained its independence from the British Commonwealth in 1962. In the 1970s, poor economic conditions led to violent unrest with a consequential loss in tourism. In 1980, the country saw the democratic socialists ousted from power through the ballot box, and subsequent governments have adopted a more market-orientated approach. However, domestic violence again flared up in Jamaica during the 1990s with the last bout of violence in the streets of Kingston in November 2000.

The Chief of State is currently Queen Elizabeth II (since February 1952), which demonstrates the ex-colony's continuing relationship with England. The Queen is represented in Jamaica through the Governor General Sir

[13] www.cid.harvard.edu/ciditg
[14] www.readinessguide.org
[15] *World Factbook Jamaica*, 2001 est.
[16] *Ibid:* estimates the population to be 2, 665, 636 (July 2001 est). The Jamaican statistical office estimates the population to be 2.58 million as at October 2000 (http://www.statinja.com/stats.html).

Howard Felix Cooke, although the governor general's position now is much more of a figure head position than a serious member of the executive.

The Head of the Jamaican government is Prime Minister Percival James Patterson (since March 1992), and the deputy prime minister is Seymour Mullings (since 1993). The Jamaican cabinet is appointed by the Governor General on the advice of the Prime Minister.

Economy

More than half of the country's exports are in bauxite minerals (alumina and bauxite), which are obvious key sectors in the island's economy, besides tourism. From 1992, the Prime Minister Patterson has bought down or even eliminated many price controls, streamlined tax schedules, and privatized government departments. Prior to Patterson coming into power, Michael Manley's government faced strict spending and borrowing controls imposed by the International Monetary Fund, and even though Paterson's government is not in receipt of IMF funding at present, many of the controls imposed by the IMF are still followed *de rigeur*. This continued control over fiscal policies has helped slow inflation-although inflationary pressures are still mounting. Paterson's government faces some tough problems; high government debt which is pushing local interest rates to higher and higher levels making it difficult for local borrowers to capture the funds needed for entrepenurial investment, increased foreign competition (Jamaica has faced some serious dumping issues from the US particularly in previously protected industries such as dairy products and agriculture), the increased number of companies going into receivership or liquidation, the shift in investment portfolios to non-productive, short-term high yield instruments, a pressured sometimes sliding exchange rate, and a widening merchandise trade deficit. In 2000, depressed economic conditions and political in-fighting led to increased civil unrest, including fighting in the streets of Kingston in November 2000.

The US remains Jamaica's primary trading partner. In 2000, merchandise imports to Jamaica from the US amounted to USD 1.41 billion, compared to USD 1.437 billion in 1999[17]. For the last twenty years, the US has been Jamaica's principal place of export. By contrast the US imported mainly bauxite, alumina, and garments.

There is no doubt that tourism continues to be the main earner for Jamaica. The tragic events of 9/11, which sent a shock wave around the world, also had its effect in Jamaica. Prior to 9/11, two thirds of the 2.2 million tourists arriving in Jamaica were from the US. Fear of flying and terrorism had a drastic impact on tourism, but the Jamaican government anticipates the figure to rise again to pre 9/11 numbers and the government is planning for an additional 628 hotel rooms to be added to the current capacity of over 23, 630 rooms.

Unfortunately, Jamaica also continues to be a major venue for the trafficking of drugs. It is a major transshipment point for cocaine from South America to North America and Europe, Cannabis is also widely available across the island, and even though the government does try to eradicate the problem, corruption continues to be a major problem.

Table 1: Basic Facts

Item	Value
Population	2, 665, 636 (est 2001)[18]
GDP	$9.7 billion (2000 est)[19]
GDP per capita	$3,700 (2000 est)[20]
Exports	$1.7 billion (f.o.b 2000 est)
Export Commodities	Prawns 40%, cashews, cotton, sugar, copra, citrus, coconuts,

[17] The US Commercial Service website: country report on Jamaica 2002: http://www.usatrade.gov.
[18] World Factbook Jamaica 2000
[19] Purchasing power parity
[20] Purchasing power parity.

	timber (1997)
Exports (Electricity)	0 kWh
Imports	0 kWh
Labor force	Services (60%), agriculture (21%), industry (19%)
Life Expectancy	73.45 years (male), 77.49 (female) (2001 est)
Under 5 mortality	14.16 deaths/1000 live births (2001 est)
Adult Illiteracy	Male (80.8%), female (89.1%)[21]
Population Growth	0.51% (2001 est)
Population below poverty line	34.2% (1992 est)
Human Development Ranking	78 (UNDP)
Human Development Index	0.738 (UNDP)

Age Structure in Jamaica

0-14 years	30% of population	411,448 males	392,559 females
15-64 years	63%	832,314	837,133
65 years and over	7%	80,059	99,176

Source: http://geography.about.com/library/cia/blcjamaica.htm

Telecom and Internet Background: *History and Key Players*

Cable & Wireless has been in Jamaica in one form or another for well over one hundred years. However real developments in the industry came in 1987 with the privatization of Jamaica Telecommunications. The first phase of privatization commenced in 1987 with the formation of a holding company, Telecommunications of Jamaica (TOJ).

In May 1987, C&W acquired 100% ownership of Jamintel (the former international communications carrier) and JTC (the domestic carrier). In 1995, the two companies were merged into one corporate entity, Telecommunications of Jamaica, with C&W holding 79% shares and the public the remaining 21%.

Two years later, as part of a global rebranding exercise, the company changed its name to C&W Jamaica. At this time, there were 4000 workers, making C&W the largest private sector employer in the English-speaking Caribbean. In the years following the merger, the company has undergone significant restructuring accompanied by redundancy exercises over a phased period. In total the company has let go of over 1400 employees.

By the late 1990s, the dynamics between C&W and the GOJ were beginning to change and the government was under increased pressure to rain in the incumbent's monopoly. The government with the approval of C&W signed up to the World Trade Organisation's Fourth Protocol (or Basic Agreement on Telecommunications), which marked a broad commitment to liberalise the telecommunications sector. This commitment was made firm in a 1998 statement of policy on telecommunications (Ministry of Commerce and Technology, 1998), which

[21] Taking as a definition of literacy age 15 or over attending school.

set out a framework for implementing the GOJ obligations under the Fourth Protocol. The framework included the introduction of competition in wireless services and in value added network services, although no specific timetable was set for the implementation of these arrangements. A primary motive for the policy change was the GOJ's desire to attract greater foreign investment into ICTs in its rapidly developing Free-Trade Zones.

In 1998, the Ministry of Commerce and Technology issued five new licenses to VSAT operators, under the Radio and Telegraph Control Act 1973. This in effect allowed subscribers to bypass C&W's network to make international calls, the downside being that VSAT was not always the best medium to make time sensitive connections.

As 1999 approached increased political pressure from the GOJ encouraged C&W to move further towards liberalization and in September 1999, the GOJ entered into a Heads of Agreement with C&WJ. The agreement contained drafting instructions for a new bill on telecommunications in Jamaica, which was enacted as the Telecommunications Act 2000. The Act allowed for a three phase transitition towards a fully liberalised market over three years, although other parts of the Act also restricted the international bypass of C&WJ's international network. The Act gave authority to the newly created Office of Utilities Regulation to regulate not only the incumbent but also the new entrants to the market.

In some respects, the Act has improved C&W's position as challenges under the Act are likely now to be commercial with disputes *between companies* as opposed to political battles between C&WJ and the GOJ. In return for some certainty of its rights under the Act, C&WJ is required to introduce 217,000 new lines in Jamaica, in particular to remote areas by March 2003.The telecommunications infrastructure in the Montego Bay Freezone area is to be upgraded and the company is also required to invest in scholarships and infrastructure for IT developments. In fact some J$16 million in scholarships has been given to the Caribbean Institute of Technology, J$90 million for the refurbishment of a factory to be converted into an Information Technology Training Facility, and a J$80 million contribution has been made to the newly created Spectrum Management Authority. The company has also improved its performance in network rollout. In 1988, there were 88,000 lines but by 2000, the company had rolled out 500,000 lines along with a fully digital network, a fiber optic ring around the island, and a mobile telephone network with around 200,000 subscribers. The company claims that it has invested $55 bn to date.

The first phase of liberalization was completed with the signing of the Heads of Agreement, allowing for an end to the monopoly of C&WJ. Up until only three years ago, C&WJ enjoyed a monopoly on virtually all telecommunication services offered in Jamaica that would have existed for the next 30 years. In order to ensure a liberalized teleocmmunication market, the GOJ arrived at an agreement with C&WJ to modify the terms of its license to permit the introduction of full competition in the telecommunications sector, on a phased basis, over a three yer period ending in 2003. At present 29 licenses have been issued since Phase II began in September 2001. Phase III is scheduled to commence in March 2003, when C&W's last monopoly industry, international services, will become fully deregulated and open to competition, although the Government of Jamaica (GOJ) has "let it be known" that it wants to bring this date forward.

Network Policy

Indicator	Stage	Description
Telecommunications Regulation	3	In September 1999, the GOJ entered into a Heads of Agreement with C&WJ. The agreement contained drafting instructions for a new bill on telecommunications in Jamaica, which was enacted as the Telecommunications Act 2000. The Act allowed for a three-phase transition towards a fully liberalised market over three years, although other parts of the Act also restricted the international bypass of C&WJ's international network. The Act gave authority to the newly created Office of Utilities Regulation to regulate not only the incumbent but also the new entrants to the market. The first phase of liberalization was completed with the signing of a Heads of Agreement with C&WJ in September 1999, allowing for an end to the monopoly of C&WJ. At present 29 licenses have been issued since Phase II began in September 2001. Phase III is scheduled to commence in March 2003, when C&W's last monopoloy industry, international services, will become fully deregulated and open to competition, although the GOJ is known to want to bring this date forward.
ICT Policy	3	There are no trade barriers for the import of ICT equipment in both hardware and software into Jamaica. CPE equipment has been fully liberalized. In January 2001, the GOJ published a five year IT strategic plan in which it sets out its vision for facilitating the use of ICTs in Jamaica. This year, the government is set to release a draft E-Commerce Policy, which will include plans to introduce digital signature and privacy laws, laws on computer misuse, and laws for consumer protection (with the GOJ encouraging the private sector to adopt self-regulatory mechanisms and codes of practice in electronic government).

ICT Policy

Background

Five Year Strategic IT Plan:

In January 2001, the GOJ published its five-year strategic plan. The preface to that plan includes this abstract:

"*A five year Strategic Information Technology Plan for Jamaica endeavours to provide a scheme for achieving social and economic progress by utilizing Information Technology (IT) as a developmental vehicle. It strives to include all sectors of the economy in a skillfully designed plan. It represents the unified effort by representatives of two countries…developed and developing, welded in one effort and for one purpose."*

The reference to the "two countries" is to the General Services Administration of the Federal Government of the United States of America, who assisted with the drafting of the plan.

The Plan sets out some broad objectives as regards ICT policy in Jamaica. It argues that Jamaica is well set to capitalize on close geographical proximity to the US; the leader of the ICT revolution. The plan divides Jamaica's ICT strategy into short-term and longer-term goals. Short-term goals are further divided into two distinct phases. Phase I focuses on thirteen action points whilst Phase II focuses on six more broadly defined objectives (both discussed below). As to timetable, the GOJ anticipates substantial progress through Phase II by December 2002. Funding is to come from the GOJ's national budget. The idea is that the government will allocate between

2% to 4% of the national budget to meet the objectives set out in the plan, and that this level of investment will continue for six to seven years until the majority of the objectives have been met.

Phase I initiatives include;

- **Telecoms Act 2000** discussed more fully in the telecom policy section to follow, but in brief, calls for liberalization of telecoms sector in three years, creation of necessary infrastructure, training of workers, and expansion of internet access: The Ministry of Industry Commerce and Technology (MICT) and Ministry of Finance will look at alternative funding proposals to develop a nationwide network: open competition in value-added and wireless services, and to bring telecom rates into line with cost:
    - Create incentives for data and telecom companies to extend services to rural and disadvantaged areas:
- **Information Technology Authority (ITA):** the plan calls for the establishment of an ITA which will report directly to the Minister of Industry and through the Minister to the Cabinet's sub-committee for IT (Senator Maxine Henry Wilson, Phillip Paulwell, Burchell Whiteman).
- **Establish a Central Information Technology Office (*Office of Partnerships*)** that will report directly to the Minister of Industry, Commerce and Technology: office will be linked with the private sector through the ITA Advisory Council. It will work with local and international authorities to develop international standards for the sector, and will also work with the Ministry of Education to develop a curriculum, which supports Jamaica's IT strategy. Staffed with about 12 people and with an operating budget of $2 million:
- Establishment of:
    - ITA Advisory Council:
    - **E-Business Advisory Committee**: already established under the chairmanship of the private sector, the committee sets out priorities for the promotion of E-Business; developing framework legislation, infrastructure development, and community access and government application
    - Cabinet Sub-Committee for IT (already established)
- **Job creation**: The GOJ aims to create 40,000 job in next five years and increase e-commerce sector's contribution to economy by US$250 million
- Utilize the export services promotion arm, JAMPRO, to promote investment and facilitate partnerships in the IT industry
- **Create a Chief Information Officer position within each Ministry:** The CIOs from each Ministry are to form a group to review potential ICT projects and select at least three in each ministry: examples include;
    - An e-commerce application to farmers/small businesses to use to seek out new niche markets for their sauces, jams, jellies, coffee, and other products
    - Linking the Ministers with the Prime Minister to promote the use of e-mail
    - Developing an application to ensure the prompt clearance of ships bringing products into Jamaican ports.
    - An application to improve the tourism industry
- **Establishment of a transparent regulatory framework** consistent with and adaptable to the emerging electronic business environment covering privacy, IP protection, and digital signatures:
- **E-commerce pilot project with the USA:** Jamaica is currently working with the US Government on an e-commerce pilot project under started under the Clinton adminsitration's Internet for Economic Development Initiative. The project which is divided into two broad phases, each phase including a number of pilot projects, is to focus on developing a private sector run "telecenter model" to provide internet access to the public for social and business purposes. Pilot projects include;
    - *Utilization of the post office for e-commerce and e-mail services: All Jamaicans to have an e-mail address, electronic ID, and pin by 2002*
    - Provision of on-line healthcare, weather, and disaster preparedness bulletins and detailed instructions
    - Marketing products (agriculture, handcrafts etc), locally and internationally (intranet/internet)
    - Agricultural extension services with links to local and international libraries

    - 2nd PHASE: sub-pilot to improve lives of the disabled, integrating the entertainment industry, use of an information network to integrate suppliers and producers with links to public libraries and *on-line distance education tools,* increased integration with Parliament
- *Public Awareness Program*: the GOJ also plans to spearhead a public information program to spread the use and advantage of IT in Jamaican society: using advertising on-line (webpages, cybercafes, radio addresses, TV, comment lines, call-in shows), town hall meetings, identifying key areas of opportunity (training and education, infrastructure, software development), developing realistic tag line ("Just do IT", "Invest in IT"), identifying the marketing managers, and giving briefings to multilaterals.

In conjunction with the Five Year ICT plan, the GOJ is also developing a *draft E-Commerce Plan*, the details of which are yet to be published, however, the E-commerce plan is expected to broadly follow a three-tier strategy for creating an Information Society:

- Strategic liberalization of the telecommunications industry
- Implementation of the National Strategic Information Technology Plan (summarized above)
- Promotion of e-commerce

The GOJ has had some success with the first tier and has already negotiated an agreement with C&W for the phased liberalization of the telecommunications sector over three years (the monopoly to end in March 2003). In terms of implementing the IT plan, the GOJ has had mixed success, and this may in large part be due to the fact that the Five Year IT plan is a little vague in defining its objectives. For example in comparing the Jamaican IT plan with similar IT strategies that were put in place for Ireland, Singapore, Canada, and South Africa, weaknesses in the detail of the Jamaican plan become evident. The Jamaican plan lacks the specific implementation timetables with detailed prioritized items, budget outlines, and the reasons for the priorities set out that some of these other countries' plans tend to have. And this is surprising considering that the US government helped advise with the plan. For example, on reading the Jamaican plan, a number of questions emerge: What are the priority applications? What is the need for these applications? What makes one application a higher priority than something else on the list? The Jamaican IT plan does however set out some specific objectives, for example:

- All Jamaicans should have an e-mail address and an electronic ID and pin by 2002
- Jamaica will establish computer labs with internet access in an additional 30% of the primary and secondary schools by year end 2002[22]. By year-end 2002, at least 60% of Jamaican schools will have a computer laboratory with up to 30 computers each.
- 25% of government information services will be available on-line by 2003
- By year end 2002, 50% of Jamaica's government procurement will be done electronically
- Students leaving grade 11 after five years of secondary education must be computer literate defined as being able to use a computer safely to do the following:
    - Compose a document using 3ord processing functions, being able to copy, cut, paste, save and print
    - Prepare a simple spreadsheet
    - Send and receive an electronic mail message
    - Access sites on the internet

The MICT is keen to stress that the Five Year ICT plan is still only a *framework document*, and being a framework document is still subject to change. It is also important to note that the MICT was only established in 1998 through the merger between the Ministries of Technology and Industry and Investment, the MICT beginning real operations in 1999. The MICT's first task was to deal with the liberalization process, which was necessary so that C&W could adjust its culture, and move from monopoly pricing to cost based pricing etc, and to allow local entrepreneurs to understand that new opportunities were arising in the industry. The MICT has been successful in this task. It's next target is to develop a sustainable environment for the growth of e-commerce, and as mentioned above, it plans to follow a three-tiered strategy. The last tier of that strategy is

[22] According to the 5 year IT plan, 170 out of 250 high schools have been equipped with computer labs under the Jamaica 2000 project (see the section on *Networked Learning* for further details).

the promotion of e-commerce, which it plans to do by example. The MICT will work with the GOJ for the promotion of the delivery of government services online. The plan is to develop an internet portal, through which citizens can gain one-stop access to government services.

This will be an important step in encouraging the private sector in Jamaica to follow with the take-up of e-commerce. In many developed countries, government is often seen as a hindrance to the take-up of electronic services, the common view being that private industry is best equipped in terms of resources and qualified personnel to lead through market forces. However in Jamaica, the GOJ is by far both the biggest supplier and procurer of electronic services, and will if it continues to generate confidence in e-commerce, be a major example to industry in terms of generating confidence.

E-Commerce Legal Policy

As a major part of generating confidence, the GOJ is planning to introduce digital signature and privacy laws, laws on computer misuse, and laws for consumer protection (with the GOJ encouraging the private sector to adopt self-regulatory mechanisms and codes of practice in electronic government). At present, the legal infrastructure is based on British law, and there have been no significant updates or changes to support the "new economy". For example, the laws of evidence in Jamaica are considered outdated with ICTs in terms of the admissibility of data from systems (eg., e-mail) in court. The basis for the introduction of new laws has been a legal review commissioned by the GOJ using external consultants[23].

However some would argue that developing a legislative framework is the least priority[24]; it's hugely expensive, time consuming and proven to be of limited value in other jurisdictions. At present, the laws are sufficiently non-specific in terms of technology implications of data collection, storage and retrieval that the current legislation, accompanied by an appropriate notification to customers is adequate and appropriate. For example, if the government was truly interested in creating confidence, government could introduce policies about its own operations that would have 75-80% effect of a new law. In short, policy reform takes up far less resources than legal reform, and there is great scope for government to act short of legislation and get 60-70% effect of legislation by changing its own operating policies without having to get involved in law drafting and parliamentary process, which in Jamaica is a three year process. The idea would be to make it politically acceptable for government agencies to conduct electronic business and then commercial businesses will follow. The caveat would off course be in consumer protection. In Jamaica, it is very much the case of *consumer beware,* and as mentioned above, the GOJ is actively planning to introduce new laws to protect the consumer.

At present, the people and businesses using e-commerce (see Networked Economy section later in this report for a breakdown of e-commerce businesses) are using a number of procedural "work arounds" which enable compliance with legislation at reduced "business risk". Many of these businesses are adopting standards and approaches which are accepted in the US and Europe. However data security and privacy will emerge as major issues, and to truly move ahead, the GOJ will also have to overcome confusion within its own culture as to understanding what ICT promotion really means. For example, there is a political mandate to create jobs (40,000 in three years), which can create confusion between *job generation* and *industry IT promotion* as if it were something like making cars. To-date, the only area where this has been bridged successfully is in telecommunications (discussed next). In this sector, the Government did three things; it opened the environment, changed policy and enabled foreign investment by introducing competition viz the two mobile operators Centennial, Digicel, and the ISP, Infochannel (now introducing ADSL to Jamaica). A similar approach now needs to be taken with the e-commerce sector.

Telecom Policy

[23] Source: Interview with MICT February 2002.
[24] For example, advisors at the USAID funded *New Economy Project.*

The main "policy event" in the telecommunications sector has been the passing of the Telecommunications Act 2000 (the `Act'), which came into effect in March 2000. The Act made some important changes including;

- The establishment of a new licensing regime
- A new spectrum management policy_the Act provides for the Minister (MICT) to develop in consultation with industry a spectrum management policy
- A new interconnection regime which mandates interconnection by public voice carriers with other licensed operators
- A change from a "rate of return" type regulation on the incumbent to a "price cap" formula
- The establishment of the Jamaican Telecommunications Advisory Council (JTAC), which is made up of members from both the public and private sectors. JTAC advises mainly on policy issues, recommends certification standards, and establishes voluntary industry codes of conduct
- The creation of a Universal Service Obligation_the Act provides for a scheme to cover uneconomic access to rural areas by apportioning the costs among all license holders on an equitable basis

Licensing

The Act sets out a three year phased transition towards full competition. Phase I, which ended in September 2001 saw the licensing of two domestic mobile carriers, Cellular One Caribbean, a St. Maarten based franchisee won the first license for USD 45 million. Centennial Communications Corp., (a US based company) acquired a majority stake of Cellular One Caribbean in 2000. The second license was awarded to Irish firm Mossel Limited (now called Digicel) for approximately USD 47.5 million. According to press reports, there are also plans by the government to auction two additional licenses in the near future.

Licenses have also been issued to about 22 ISPs (15 operating, 7 new licensees). With the commencement of Phase II in September 2001 (and ending in February 2003), new licenses were also issued in the following areas;

- Domestic voice carrier and service provider licenses (4 licensees)
- Licenses for the resale of C&W domestic switched minutes (17 licensees)
- ISP licenses to cable TV operators excluding the provision of voice services (7 licensees)

As a result of renegotiating its licenses with the GOJ under the Telecommunications Act 2000, which came into effect in March 2000, C&W received a number of new licenses, all of which extend to March 14th 2015. These include;

- Carrier (Cable & Wireless Jamaica Limited)
- Service Provider (Cable & Wireless Jamaica Limited)
- Spectrum (Cable & Wireless Jamaica Limited)
- Domestic Mobile Carrier (Cable & Wireless Jamaica Limited)
- Domestic Mobile Service Provider (Cable & Wireless Jamaica Limited)
- Domestic Mobile Spectrum (Cable & Wireless Jamaica Limited)
- Free Trade Zone Carrier (Jamaica Digiport International Limited)
- Free Trade Zone Service Provider (Jamaica Digiport International Limited)

In September 2001, the domestic voice market was liberalized. Licenses have been issued to 10 service provider licenses and 6 carrier licenses. Each company with a carrier license also has a service license. Four carriers will be using C&W infrastructure to provide a service. None are operational as of yet. Digicel has both a carrier's license and a wireless license (fixed), Jamaica Public Service Company (electricity company over a grid network, probably providing a wireless service for business), GoTel (to begin service in April 2002, and claiming nationwide access using a microwave platform with wireless local loops for both residential and business customers).

There are approximately 15 licensed ISP providing dial-up internet access in Jamaica, of which the larges are Infochannel, C&W, N5, and Colis Internet. In February, Infochannel bought a controlling interest in Colis Internet. Centennial have a controlling interest in Infochannel with a director on the board of Infochannel. Only C&W and Infochannel have Points of Presence (POPs) in all parishes.

The Act is silent about the licences that may be issued during Phase III (commencing March 2003). A new Telecommunications Act, or at least a substantial amendment to the Act, will need to be passed by that time as the present Act's main function is to put in place the steps *leading* to full liberalization rather than creating a regulatory framework suitable for a fully deregulated environment.

The Telecommunications Regulator

The Office of Utilities Regulation (OUR) is the Jamaican telecommunications regulator but also functions as a regulator in other utility sectors (electricity and water) under the OUR Act. In the telecommunications sector, the OUR derives its authority to regulate from the Telecommunications Act and amendments made to the OUR Act subsequent to the enactment of the Telecommunications Act. Under the Act the OUR is mandated to:

-advise the Minister on the provision of telecommunications services. The OUR itself does not have licensing powers but invites applications for licenses, processes the licenses and then makes recommendations to the Minister as to whether the applications should be approved or denied. To date the Minister has followed all the recommendations of the OUR
-promote the interests of customers while having due regard to the interests of carriers and service providers
-carry out at its own initiative or at the request of any person, investigations in relation to a person's conduct as will enable it to determine whether and to what extent that person is acting in contravention of the Act
-make available to the public information concerning matters related to the telecommunications industry and to promote competition among carriers and service providers

The OUR is solely responsible for assigning numbers for telecommunications services to carriers and service providers and to developing a numbering plan. It may make rules regarding the assignment and use of numbers by carriers and service providers, and must act on a non-discriminatory basis. In many respects, the OUR is structured in a very similar way to the Office of Telecommunications (OFTEL) in the United Kingdom. Under the Act the OUR is empowered to issue cease and desist orders, as well as to make rules. These rules may provide for the imposition of penalties on summary conviction in a Resident Magistrate's court of fines and or imprisonment.

The Telecommunications Appeals Tribunal

The appeals tribunal has the power to hear appeals against decisions of the OUR, and can confirm, modify or reverse the decision of the OUR; or refer the decision back to the OUR for reconsideration. Again, English regulatory principles are applied, such as the principles of natural justice and procedural fairness.

The Spectrum Regulator

The Act separates the regulation and management of Spectrum and the regulation of facilities that use the Spectrum. The OUR is responsible for regulating facilities while spectrum management and allocation is the responsibility of Minister, who has delegated these powers to the newly created Spectrum Management Authority (SMA). Under the Act, the SMA does not enjoy the same level of independence as the OUR.

The Competition Authority

In Jamaica, antitrust is covered by the Fair Competition Act, and enforced by the Fair Trading Commission. However to avoid two regulatory bodies (Fair Trading Commission and OUR) regulating the same sector, the government decided to empower the OUR to regulate all competition issues arising in the telecoms sector. The OUR still however has a duty to consult the FTC over competition-related issues. Under the Telecommunications Act the OUR is required to determine which public voice carriers are to be classified as dominant public voice

carriers and in making this determination the OUR is required to consult with the FTC and take account of any recommendations made by the Commission. In practice the OUR and FTC work closely together having regularly scheduled meetings to discuss cases which affect both agencies.

Trade Policy

The GOJ is keenly aware of its position with regard to international trade, and appreciates that the promotion of e-commerce will require an international e-commerce strategy. One of the first priorities is to identify those digital products and services suitable for export. There are no tariffs imposed for the import of hardware and software into Jamaica. Table 2 below shows the value of imports for the years 1999 and 2000.

Table 2 : INFORMATION TECHNOLOGY IMPORTS IN JAMAICAN DOLLARS & NUMBER JANUARY – DECEMBER 1999-2000

		1999		2000	
SITC #	DESCRIPTION	VALUE JA$	QUANTITY NO.	VALUE JA$	QUANTITY NO.
7521000000	Analogue or hybrid automatic data processing machines	23,031,320	837	8,346,195	60
7522000000 laptops	Other digital automatic data processing machines comprising in the same housing at least a CPU and an input and output unit whether or not combined (laptops)	325,361,677	7,893	293,619,737	9,109
7523100000 p. computers	Portable digital automatic data processing machines, weighing not more than 10 kg, consisting of at least a CPU, a keyboard and a display	116,573919	4,583	137,360,321	2,675
7523300000 mainframe	Digital processing units other than those of sub-headings 752.2 and 752.39, whether or not containing in the same housing one or two of the following types of unit: storage units, input units, output units	23,130,227	53	28,868,188	353
7523900000	Other digital automatic data processing machines, presented in the form of systems	354,676,555	6,433	332,962,150	6,527
75261000010	Laser printers	50,168,393	2,752		
7526100020	Dot Matrix printers	19,151,153	1,666	54,189,234	8,344
7526100030	Ink Jet printers	28,194,970	3,516	35,431,828	5,839
7526100090	Printers nesoi	122,799,692	7,963	89,363,691	6,570
26900000	Other input or output units, whether or not containing storage units in the same housing	170,370,539	27,585	225,830,915	38,767
7527000010	Floppy disk drive	3,511,176	3,212	2,136,037	2,813
7527000020	Magnetic Fixed disk drive	7,983,738	616	18,581,107	9,998
7527000030	Optical disk drive	4,986,189	2,331	4,244,395	1,754
7527000090	Storage unit whether or not presented with the rest of a system nesoi	17,128,486	3,040	37,446,690	7,152
7529100000	Other units of automatic data processing machines	62,413,772	1,035	86,053,950	2,842
7529900000	Other data processing equipment NES	96,517,731	3,216	46,232,009	3,332
	TOTAL	1,425,999,537		1,400,666,447	

Source: Statistical Institute of Jamaica/MICT

Note: SITC #Standard International Trade Classification. In 1999 there were changes to the classification of items traded, which included IT imports. Since 1999, the category micro computers (SITC 7522100000) has been split between SITC 7523100000 and 7522000000

Jamaica is currently a participant in the Free Trade Area of the Americas Joint government-private Sector committee of experts on e-commerce and chair of the Caribbean Regional Committee on e-commerce and

intellectual property. Also Jamaica is planning to become a signatory to both the WIPO "internet" treaties: The Copyright Treaty, and the Performanes and Phonograms Treaty, as well as to establish at least one certification center under the UNCTAD Trade Point Project, and to identify and pursue through CARICOM strategic e-commerce interests that will benefit the region.

WTO

Jamaica is a member of the Caribbean Telecommunications Union, the International Telecommunications Union as well as a signatory to Intelsat. Jamaica is also a signatory of the WTO Basic Agreement on Trade in Telecommunication Services adopting all the regulatory commitments, including the Reference Paper on regulatory principles, which sets out provisions for cost-based interconnection, universal service, and restrictions on cross-subsidisation by major suppliers (In Jamaica's case the incumbent carrier C&WJ).

Free Trade Zones (FTZs)/Warehouse

Under the Jamaican Free Zones Act, investors can operate free of Jamaican customs, but solely with foreign exchange in activities such as warehousing and storing, manufacturing, redistribution, processing, refinining, assembling, packaging, and service operations such as insurance, banking, professional services, and information processing. Call center operations and garment factories have been particularly successful in Jamaica in recent years (see Networked Economy for more details). FTZ incentives include 100% tax holiday in perpetuity, no import licensing requirements, and exemption from customs on capital goods, raw materials, construction materials, and office equipment. Free zone companies are allowed to sell about 15% of their annual production in the local market.

Jamaica has three main free zone areas, the Kingston Export FTZ, the Montego Bay FTZ, and Garmex. These free zones are government owned and managed. However, a company, particularly one involved in ICT services can still enjoy the benefit of FTZ rights without having to be physically located in a FTZ. This is because the government can accord Free Zone status to a company not located in any of the existing Free zones. In this way, individual companies satisfying specific criteria can apply either to the Kingston or Montego Bay Free Zones for single-entity free zone status.

Network Access

	Stage Two	Stage Three	Stage Four
Information Infrastructure	Rural Jamaica is not nearly as well served as the urban areas, which reflects the high cost of service provision by C&W to serve the rural communities. The waiting time for a fixed line in rural areas can be anything from two weeks to several months.	Access to telecommunications infrastructure is generally good in most urban centers with a national teledensity of 23 lines per 100 people (500,000 fixed lines in total). However, the number of mobile subscribers is estimated at 475,000 meaning that mobile penetration will at some point soon overtake fixed-line penetration.	
Internet Availability	Rural Jamaica. Most rural primary and secondary schools have access to the internet (usually over a single copper line), although the data rates offered vary greatly from 14Kbps to 56Kbps. Also, in most schools, students are charged for time to access the net to help subsidise the school's fees to the ISP and to C&W, although the Ministry of Education will shortly be making available some cash grants to help most schools cover the cost of internet access.	Urban Jamaica is quite advanced with the take-up of internet access. Although C&W is clearly the dominant provider and is a Tier 1 operator, other ISPs including Infochannel and N5 are fast catching up. Only C&W and Infochannel currently have points of presence in each of the Jamaican parishes. There are 22 licensed ISPs in Jamaica with 15 of them currently operational. The total number of subscribers is estimated to be around 150,000, although many users share accounts.	
Internet Affordability			With the high level of competition in Jamaica for internet service provision, prices are in line with OECD rates. However, the above cost of leased-line provision is still continuing to maintain prices higher than they would ordinarily be.
Network Speed and Quality			Urban Jamaican Communities that have access to fixed lines access a modern network offering good reliability. Some 90% of telephone calls are successful. Dropped connections are fairly infrequent. Access to dial-up modem transfer speeds up to 56 Kbps across the national network. Backbone facilities serving communities usually sufficient, although regular peak demand may slow response times.
Hardware and Software			Most ICT products are sourced from abroad, but local industry is growing and adapting products to local needs. A variety of hardware and software solutions is available and affordable to most small and medium-sized businesses as well as many individuals.
Service and Support	Rural Jamaica has a real patchwork of service and support. In some of the more remote parishes, main line installation can take well over a month with service and support also underpeforming urban	Mainlines take at least one month for installation. There is a nascent software industry and a growing number of hardware technicians and network administrators. Mainline problems are generally resolved between two and five	

	communities.	working days.	

Information Infrastructure

Table 3: Teledensity in Jamaica

Country	**Telephones** (mainline and cellular, per 1000 people) **1999**	**Internet** Hosts (per 1000 people) **2000**
Jamaica	255	0.4
Trinidad & Tobago	246	7.7
Barbados	538	0.5
Bahamas	422	---

Source: Human Development Report UNDP 2001

Fixed Services

C&W signed an agreement (dubbed "New Connections") in September 1999 that led to the introduction of the new Telecommunications Act in March 2000 (discussed in the earlier Network Policy section). The agreement created the road map for the establishment of a fully liberalized environment over a three-year period. Under the New Connections Agreement, C&WJ made a number of infrastructure commitments[27]:

- C&W is under an obligation to roll out 217,000 new lines by March 203. It is on target to meet this goal and has already installed 117,000 lines with another 100,000 lines yet to be installed. However, even this clearly defined target has an element of grey about it. Under the Act there is no definition as to where the new lines should be introduced (for example whether specifically in rural areas). Also if a line is disconnected, it will still be classed as a new line. More than 50% of the new subscribers (new connections) to fixed-line services drop off after the first 6 months, mainly in rural or low income areas. What is surprising is that many in similar situations find that they can afford a pre-paid mobile telephone service even though the mobile service tariffs are higher. This is because there are more people who can afford the service on a prepaid basis. It is the prepaid element with mobile that is important rather than with fixed-line, where subscribers have to pay at the end of the month and then suddenly realize that they cannot pay. The costs for residential/business telephone access is illustrated below.

  EXCHANGE LINE RATES (MAIN LINE & PBX TRUNKS)

	BUSINESS	**RESIDENTIAL**	
		STANDARD	LOW USER
	J$	J$	J$
Installation	**940.00**	**660.00**	**660.00**
Rental	**740.00**	**310.00**	**140.00**
Reconnection	420.00	300.00	300.00

[25] Teledensity is the number of telephone lines per 100 people
[26] ITU Telecommunications Indicators, www.itu.int.
[27] C&W Annual Report 2001

- An expenditure of J$168 million to upgrade C&W's wholly owned subsidiary, Jamaica Digiport International and provide internet access to 60 post officers across the island. To-date , 22 of the 60 post officers have been upgraded. JDI operates in the Montego Bay Free Zone as an approved operator under the Jamaica Export Free Zones Act, with consequent indefinite relief of income tax from its profits on fee zone activities.
- An investment of J$90 million to refurbish the old Goodyear factory in St Thomas to create a call center

In 2001, C&W invested J$6.58 billion to expand its network. The investment supported the addition of 233,000 new customers (of which 32,900 were in rural communities)[28]. Other improvements include:

- The commissioning of one 3,840 line Remote Switching Center at the East Exchange
- The South Coast Fibre System submarine cable was commissioned and the infrasdtructure upgraded to run live traffic during the month of November 2000. The work included integrating the south coast and the north coast cable systems roviding a self healing fiber ring and physical diversity for telecommunications traffic around the island.
- Phase out of analogue mobile services. During December 2000, 100% digitization of the network was achieved
- A second mobile switch was commissioned in Montego Bay.

C&W's 2001 annual report explains that these upgrades led to a 12% increase in gross revenues to J$20.2 billion, up 12% over the previous year, indicating also that the growth in revenue reflects increased demand for mobile and data services, as well as strong demand for its pre-paid calling card product, "World-Talk"[29]. Growth in revenue however was offset by the continued reduction in international accounting rate settlements (primarily the US carriers), and bypass of the C&W network through the use of YAPJACKS (VoIP bypass) and unlicensed VSAT.

Mobile

There has been a remarkable take-up of cellular services in Jamaica since the introduction of competition to C&W in the cellular market. Both Digicel and Cennetinal communications are active in competing with C&W and have$150{,}000$, and $25{,}000$ subscribers respectively in contrast to C&W's $300{,}000$ subscribers[30].

The GOJ is concerned that the take-up of wireless could at some point damage broadband service delivery. In terms of usefulness of access, wireless access is not sufficient enough to meet the information society requirements that the GOJ has spelled out in its five-year strategic plan. There is discussion within government circles of pushing for a more acceptable penetration rate and also at a certain bandwidth as part of a minimum universal service obligation. Current thinking is that narrowband access is not sufficient to meet current demands for bandwidth as envisaged by the five-year strategic plan.

Telephone penetration

Telephone penetration across Jamaica is still focused in the more populated urban and tourist areas, whilst some rural parts still remain to be serviced. To-date, the total number of main lines installed come to 500,000 yielding a telephone density of over 17.5. Between schools, there is widespread variability in time for installation: some schools have been waiting for 2 years to gain access, others 6 months, and a few schools interviewed for this report within a week of request. At present, there is no universal service access obligation

[28] *Ibid*.

[29] It is also important to note that in accordance with the Telecommunications Act 2000, that from the 1st March 2002, the company stopped operating under the Rate of Return Scheme (which provided a return on specified capital employed of 17.5%-20%). From March 1st, the company became subject to a price-cap regime. This will no doubt change the way in which accounting information is presented.

[30] Source: Interview with C&W March 1st 2002. These figures are only approximate.

on C&W to provide schools with sufficient access. The GOJ has not yet defined an Universal Service Obligation (USO) for schools in legislation, but in any redrafting of policy, such an obligation might become increasingly relevant.

New legislation might call for telephone access to include internet access. There is a draft framework policy to include particular sectors such as health and education. The GOJ is also considering whether certain minimum technical standards need to be set to provide service to remote schools.

Cable penetration is high in Jamaica and there are currently 37 licensed cable companies. The reason for the high penetration may be partly explained by the high reliance on US satellite broadcasting and access to US news and entertainment feeds. The cable industry in Jamaica started as a "street level" operation with young enterpeneurs illegally piggybacking on C&W infrastructure, and circumventing licensing and infrastructure rules and US copyright in satellite content. At present, 10% of households are estimated to have been passed by cable[31].

Leased lines

Currently, C&W is required to provide leased-lines at cost. At present, the company has not competitors in the leased-line supply market. Lewis Group are intending to go into the data market with Metropolitan Area Networks in Montego Bay, Kingston, and other dense urban areas. The MICT is hoping that with the full introduction of competition by March 2003 in both domestic and international markets, the leased-line market will become competitive. It would like to see the cost of a domestic leased line fall from around USD 9000 to USD 1000 per month. The Ministry believes that there is considerable margin for C&W's leased-line costs to fall from current levels because current tariffs are not being provided at cost. C&W's present leased-line rates are shown in the tables below.

Table 4: C&W's DOMESTIC LEASED LINE RATES (2002)

PRODUCT DESCRIPTION & CUSTOMER TYPE	INSTALLATION CHARGE	RENTAL CHARGE
***Intra-Parish Leased Circuit** 1.2K	$JA 9,227	$JA 8,330
" 2.4K	9,227	8,330
" 4.8K	9,227	8,330
" 9.6K	9,227	8,330
" 19.2K	9,227	8,330
" 64 K	9,227	9,165
" 128 K	26,600	17,325
" 192 K	26,600	23,160
" 256 K	26,600	29,014
" 384 K	26,600	34,868
" 512 K	26,600	47,967
" 768 K	26,600	64,980

[31] *Ibid.*

“	**T1**	31,650	**70,746**

Source: C&WJ *Line originates and terminates within parish (Inter-parish circuits not shown)

Table 5 : C&W's INTERNATIONAL LEASED LINE RATES (2002)

		COUNTRY (Monthly Rentals in US$)							
		Cayman		Caribbean		N. America		U.K.	
Speed (Kbps)	Install (US$)	Intra Parish	Inter Parish	Intra Parish	Inter Parish	Intra Parish	Inter Parish	Intra Parish	Inter Parish
2.4	800	625	685	875	935	950	1,010	1,200	1,260
4.8	800	700	760	1,000	1,060	1,090	1,150	1,390	1,450
9.6	800	925	985	1,375	1,435	1,510	1,570	1,960	2,020
Voice grade	800	1,150	1,210	1.750	1,810	1,930	1,990	2,530	2,590
19.2	1,300	1,340	1,400	2,050	2,110	2,280	2,340	3,005	3,065
56/64	2,300	1,775	1,920	2,775	2,920	3,075	3,220	4,075	4,220
128	3,800	3,145	3,275	4,895	5,025	5,420	5,550	7,170	7,300
192	3,800	4,070	4,245	6,320	6,495	6,995	7,170	9,245	9,420
256	3,800	5,260	5,490	8,160	8,390	9,030	9,260	11,930	12,160
384	3,800	6,770	7,070	10,470	10,770	11,580	11,880	15,280	15,580
512	3,800	8,717	9,115	13,467	13,865	14,892	15,290	19,642	20,040
768	3,800	11,280	11,815	17,380	17,915	19,210	19,745	25,310	25,845
1544	5,950	15,550	16,435	23,350	24,285	25,705	26,640	33,555	34,490
2048	5,950	18,725	19,660	28,725	29,660	31,725	32,660	41,725	42,660

Source: Cable & Wireless Jamaica

The Ministry also expects these leased-line costs to fall with the rollout of new fibre infrastructure to be laid under a new highway project being planned to connect Montego Bay with Kingston. The *Highway 2000 Project* is planned to cut through the center of island. Phase II will connect with the Jamaican tourist town of Ocho Rios in the north. The French telecommunications company Boygues Telecom was awarded the contract.

Cable operators are also able to provide internet services, but at present they cannot provide leased-lines although the law is unclear, as the licenses are vaguely drafted. The Minister for Industry commerce and Technology can decide the government's policy in this area, but is still needing to decide whether the cable operators should be given rights with regard to the provision of leased-lines. However, as the issue of convergence is rapidly gaining ground in Jamaica, particularly with the acquisition of several cable companies by ISPS, the issue has been tabled for discussion. The Telecommunications Advisory Council is advising the Minister on the point of cable company access to leased-lines.

Cost-based pricing

Prior to the Act, C&W did not have to cost their services separately. Accounting standards only had to comply with the Companies Act, and the company was not required to set up separate accounts. However, the Act now requires C&W to bring its tariffs into line with cost, and to this end, the company is currently negotiating with the Office of Utility Regulation (OUR) to set appropriate standards in this area. C&W has already submitted a set of draft accounts to the OUR, which the OUR is currently examining. The Act allows the OUR to determine the most appropriate accounting standards. The OUR's long term objective is to set Long run Incremental Cost

(LRIC) as a floor for its costing standard and standalone costs as the ceiling in line with best practice in the industrialized nations. OUR has already engaged international consultants to advise them on putting in place a suitable cost-based methodology.

At some point, C&W will also have to deal with the contentious issue of rate balancing. The real reason for maintaining the monopoly is that the pricing of international traffic is well above cost. This then subsidizes local service. Rate rebalancing will be a contentious issue with local voters, already very sensitive over the rising cost of staple products. For example, when the government decided to raise the cost of gasoline in April 1999, it sparked off riots throughout Jamaica. There is belief within government circles when international charges come down, the public will also expect local rates to follow suit. However, the MICT anticipates to overcome negative public opinion with a wide available public information programme throughout the island to educate the local population in the need to raise local rates whilst bringing down international rates.

Bringing forward full competition

The defined date set for full international competition is March 2003. However, there is discussion in government circles on bringing forward this date, which might trigger a compensation package for C&W, although the GOJ is keen to play down this point.

IP Telephony:

Over the last year, C&W has continued to face increasing amounts of voice bypass through the use of Yapjacks, that make use of the internet and the VoIP protocol to transit voice. C&W claims that the company is loosing millions of Jamaican dollars to the use of these Yapjacks, and has complained to the Office of Utility Regulation (OUR) to seek action against infringers.

However the law is unclear on the use of the Yapjack. The Act allows the Minister to prescribe equipment. If it is prescribed, a license is required to import and distribute (sell it). The OUR believes that YAPJACKS are not illegal as the device is not prescribed and therefore does not require a license. However *VoIP is defined in the Act as a voice service* and C&W is the only provider in Jamaica for such services, and therefore the provision of YAPJACK *services* are illegal (as the OUR interprets the law). It is the provision of the VoIP service and not the device itself that is illegal. Under the Act, the OUR has the power to issue cease and desist orders to local YAPJACK representatives, which at the time of writing, it was considering pursuing.

Internet Availability

There are 15 operational ISPs in Jamaica at present (22 licensed). Only two of them, C&WJ and InfoChannel, have points of presence in each of the 14 Jamaican parishes and can therefore offer local rate dialing to customers. The total number of subscribers is estimated to be around 150,000, although many users share accounts (estimated at 80,000), and also gain access to the internet whilst at work.

Internet in Jamaica - 2002

Internet subscribers (2000)	150,000[32]
Domain names registered per 1000	2
Total domains registered	900-1000[33]
Cable operators[34]	37

[32] Ibid.
[33] Source: interview with the University of West Indies (the domain name registrar in Jamaica) February 2002.
[34] From September 2001, also licensed to provide internet services and therefore included in this table.

Points of Presence	14[35]
ISPs	22[36]
Telephone Lines	500,000
Teledensity	17.5[37]
Internet cafés	6 in Kingston

Sources: Infochannel, C&WJ, and UWI

Internet Affordability

Because of the high level of competition in the industry, pricing for internet access is within OECD levels. Local telephone costs have also been kept at a relatively low level as C&WJ is yet to introduce a policy of rate rebalancing. Local telephone costs are subsidized by high international telephone charges and high accounting rate settlements for in-bound international calls.

Network Speed and Quality

C&WJ operates a fiber ring around the island consisting of the Cayman Jamaica Fiber System (CJFS) and the South Coast Fiber System (SCFS). This fiber ring around the island has been supplemented by a recently enhanced digital microwave network allowing for necessary redundancy. The $750 million investment in the SCFS by C&WJ is the latest in its program to further modernize and expand the capacity of its transmission network. Telecommunications traffic was first put on the system in December 2000, and at present, the SCFS has the capacity to handle approximately 33,000 voice calls simultaneously, representing an 50% increase in capacity along the island's south coast.

Hardware and Software

Most ICT products are sourced from abroad, but local industry is growing and adapting products to local needs. A variety of hardware and software solutions are available and affordable to most small and medium-sized businesses as well as many individuals, and there are many distribution points around the island, although concentrated in the urban or tourist centers of Jamaica.

Service and Support

Mainlines take at least one month for installation, although service and support levels on average tend to take longer in the more rural areas. There is a nascent software industry and a growing number of hardware technicians and network administrators. Mainline problems are generally resolved between two and five working days in urban Jamaica. In rural Jamaica, the timeframe can be anywhere between one week to a month.

[35] The Jamaica Gleaner: feature posted October 2001. Note that only C&W and InfoChannel have Points of Presence in each of the 14 Jamaican parishes.
[36] Licenses have also been issued to about 22 ISPs (15 operating, 7 new licensees).
[37] Lines per 100 people.
[38] www2.sn.apc.org/africa/insys.cfm

Networked Learning

	Stage One	Stage Two	Stage Three
Schools' Access to ICTs		Rural Jamaica, the Ministry of Education together with the HEART Trust (government executive agency), and the *Jamaica 2000 Foundation* has worked hard to put a computer lab (with at least 15 computers) into most primary and secondary schools in rural areas. A number of "cluster" projects were developed as part of the *EdTech* 20 project (supporting 15 primary schools with a target of 32). The new plan under the *Multicare* project is to install fully multimedia rich (20 station) labs for training the lecturers at the teacher training colleges. A major problem for schools in rural areas has been getting access to adequate fixed-line telephone infrastructure.	Urban Jamaica, computers are found at university, technical college, secondary, and primary school level. Computer labs exist and are open at universities to students after hours. LANs are often in place. Equipment tends to be fairly new, particularly at university level. Networked labs get Internet connectivity through a dial-up connection to the Internet. According to the 5 year IT plan, 170 out of 250 high schools have been equipped with computer labs under the Jamaica 2000 project
Enhancing Education with ICTs		Rural Jamaica, computers are used mostly to support traditional work and study. Teachers use computers for word processing and potentially some research on the Internet.	Urban Jamaica, the use of ICT education in schools, technical colleges, and particularly the Universities (University of West Indies at Mona, and the University of Technology) is well developed.
Developing the ICT Workforce		Rural Jamaica, the Ministry of Education and the HEART Trust regularly organize teacher-training courses for the use of ICT in education. However access to training is limited given the lack of resources to train the 20,000 teachers in the whole school system (with 6000 teachers at the secondary and tertiary levels).	Urban Jamaica is well equipped with sufficient secondary and tertiary institutions offering a high standard of training in the use of ICT. The Caribbean Institute of Technology in Montego Bay has graduated 215 student programmers since incorporation, and the University of West Indies and University of Technology have large computer science faculties. The Information Technology Project (INTEC) funded by the auction of two cellular licenses by the Government in 2000 has provided J$234 million for the training of 10, 611 students in IT (4,460 graduating from a range of programmes with 2000 being placed in IT positions across Jamaica).

Schools' Access to ICTs

Schools access to ICT has to-date been a three-pronged effort between the Jamaica Computer Society Education Foundation (JCSEF), the Human Employment and Resource Training Trust/National Training Agency (HEART/NTA), and the Ministry of Education. Between the three, a number of projects have been implemented

throughout primary, secondary, and tertiary institutions in Jamaica with varying degrees of success. In conjunction with projects targeted at schools, the GOJ has also used funds from the Information Technology Project (INTEC) to train 10, 611 students in information technology at the tertiary level[40]. It is also important to note that the GOJ has committed itself in its Five Year ICT Strategic Plan to establish computer labs with internet access in an additional 30% of the primary and secondary schools by year end 2002[41]. By year-end 2002, at least 60% of Jamaican schools will have a computer laboratory with up to 30 computers each. The spread of computer labs throughout the schools sector will also have a beneficial impact on the rest of the community as the GOJ has stated in the Five Year Plan that these computer labs are to be made available to the general public during off-hours[42].

Jamaica 2000 Project

In 1992, the JCESF in partnership with HEART, a number of business partners from the private sector, and secondary school communities, launched the Jamaica 2000 Project (now the Jamaica 2000 Foundation). The project's aim was to establish 15 station computer labs in each secondary school, community college and teachers' college and provide in-service training for teachers. The aim was to provide seamless training for those students graduating from the secondary level and moving up to the Community Education Colleges (CXC) to study computer studies. In this way, the government hoped to build up the pool of potential computer professionals.

The HEART Trust (an Executive Government Agency and part of the Ministry of Education) contributed J$60 million to the project (amounting to about 40% of total project costs). The secondary schools contributed approximately 20% with business partners from the private sector contributing the remaining 40%.

The Jamaica 2000 Foundation's role has over the last year changed from being a provider of computers into schools, more to a specialized consultancy advising schools and colleges on the most appropriate technology to install and the training of teachers in the use of ICT in education. Recently, the Foundation approached the Ministry of Education for an extension of funding for the training of teachers, but because the Ministry itself was undergoing a period of restructuring, the extension was turned down. The Foundation therefore has had to scale down its operations from an eleven man staff to one full-time member (the Technical Director), who will resource projects as they arise with locally recruited ICT professionals. It is hoped that with lower overhead cost, the Foundation will be able to provide more streamlined services, which will include;

- Completing a technology needs assessment: The Foundation will work with the school to determine what the school's needs are;
- Developing a technology plan
- Working with the school to develop a specific solution, which will be integrated into the curriculum of the school
- Using the Foundation's information database on the suitability of different types of educational software that has already been evaluated
- Using in-house expertise in equipment procurement and network implementation: purchasing process has been approved by the IDB/World Bank (the Foundation has in the past benefittedfrom volume discounts and competitive bidding: schools individually even now approach the Foundation for buying computers in bulk. Foundation charges the schools a variable fee depending on the size of the order)

Global Teenager Project

The Global Teenager Project (GTP) is an initiative of the International Institute for Communication and Development (IICD) in the Netherlands. The project seeks to connect disparate secondary schools around the

[40] Report to the Development Council: status of the INTEC project 01/21/2002.
[41] According to the 5 year IT plan, 170 out of 250 high schools have been equipped with computer labs under the Jamaica 2000 project (see the section on *Networked Learning* for further details).
[42] Phase I Initiatives: A Five Year Strategic Information Technology Plan for Jamaica January 2001.

world creating a network of students who teach each other and learn from each other simultaneously by posing and researching questions based on various themes. At the heart of the project lies the Virtual Campus where students and teachers exchange messages concerning the specific project on which they are working. The network is currently comprised of schools in South Africa, Bolivia, Latvia, Sweden, Ghana, the Netherlands, Tanzania, Slovenia, Switzerland, Zimbabwe, Kenya, Zambia, Romania and Jamaica. Each country coordinates its respective program locally through an IICD education partner. In the case of Jamaica that partner is the Jamaica Computer Society Education Foundation (JCSEF). Currently, 75 schools with approximately 2000 students are actively participating in the network. To participate, a reliable email facility is all that is required. For those schools that may not have access to such a facility, IICD has implemented the Adopt-a-School Program which allows organizations, companies and individuals to adopt a school in a developing country. Through this program schools are provided with not only the enabling hardware but with training as well.

GTP Goals and Objectives

The goals of GTP are:

- To share individual, regional, and cultural perspectives
- To foster problem-solving and critical thinking skills
- To enhance communication skills
- To develop co-operative and collaborative work strategies, and
- To learn to use telecommunications technology

In Jamaica there are currently eight schools participating in the GTP project with two additional schools slated to join in the near future. The ten schools that represent Jamaica on the network are: Glenmuir High School, Titchfield High School, St. Elizabeth Technical, Bog Walk Comprehensive, Little London Comprehensive, Wolmer's Girls School, St. Thomas Technical, Ruffee High School. Wolmer's Boys School. These schools are diverse in geography, technology and subject matter; they span the island from east to west. For example, Wolmer's Boys School is a technical school that has computers labs with approximately 45 computers in aggregate. This is three times the number of computers available in most other computer labs found in these representative Jamaican schools. While Wolmer's Boys enjoy a 45 computer facility, Little London at first did not have any of the requisite Internet/email facilities. Through IICD's Adopt-A-School program, however, Little London Comprehensive was able to obtain four computers with Internet access and a printer.

Project Structure

The "class" in each school is comprised of ten students in each grade. Each school has a coordinator and a "class" teacher. Each class is then assigned a learning circle that is governed by a particular theme. Themes of March and September 2001 include: Health, Nature, Human Rights, Culture, Trade, Sustainable Development, Leisure, HIV/AIDS, My Life. Each class then poses a question on the particular theme and members then research the question and send answer through the circle.

Jamaica GTP Going Forward

The GTP in Jamaica continues to enjoy tremendous success, especially in Glenmuir High School. The prospect of adding schools to the network in the near future is a definite possibility and as evidenced by the scheduled addition of two new schools, it is clear that Jamaica will be expanding its presence on the network[43].

The Ed-Tech 20/20 Project

[43] For more information on the IICD and the larger GTP see: http://www.iicd.org/globalteenager/ and http://www.ict-edu.nl/Language

The Ed-Tech 20/20 Project for Primary Schools is a public/private partnership that is part of the Five Year Strategic Information Technology Plan for Jamaica (National Strategic Plan)[44]. This National Strategic Plan seeks to expand the technology sector of Jamaica in a logical and systematic manner. Using US$1M from the Inter-American Development Bank, the Round Table Think Tank on Education created the Ed-Tech 20/20 project in order to train and develop the next generation of ICT users in Jamaica. The ultimate goal of Ed-Tech 20/20 is to improve the quality of education and the level of literacy in the nation's primary schools through the introduction of computers in an effort to combat the declining literacy rate. Project aims include the installation of 21 computer laboratories in 15 primary schools in four poor rural communities. The Jamaica Computer Society Education Foundation is the Executing Agency for the Project[45].

PROJECT STRUCTURE

Ed-Tech 20/20 is a pilot project in primary school clusters of four rural communities: Malvern in the Parish of St. Elizabeth, Oracabessa in St. Mary, Above Rocks in St. Catherine, and Frankfield in Clarendon. The computer facilities were placed in areas where computer laboratories already existed in secondary and tertiary educational institutions. A major component of the pilot is evaluation of the reading and numeracy skills from use of the software and implementation of the adjusted curriculum. Key findings from this project will form the basis of future education planning and expansion in other primary schools throughout the country.

Ed-Tech 20/20 is structured so as to:

- Explore the usefulness and cost-effectiveness of courseware to assist with literacy and numeracy,
- Examine alternative instructional models such as computers on carts that are wheeled into the classroom and assigned lap-tops to teams doing project work,
- Implement a comprehensive teacher-training program to determine best practices in the training of teachers and education officers,
- Establish a teacher training resource center at the Ministry of Education and Culture to facilitate continuity,
- Establish software resource centers that will allow schools to explore the use of various software and other technology based material, and
- Examine the feasibility of intranets/extranets as a resource and/or training tool

The project has made tangible strides:

- Computer facilities have been placed in 15 primary schools
- Improved capability of teachers to utilize the technology in instructional delivery
- Over 60 teachers have been trained in the use of the technology in the teaching and learning process
- 12 teachers are undergoing certification as trainer of trainers to undertake the training of other teachers
- Over 450 students have been involved in a program which uses software in Computer Assisted Instruction (CAI) to improve proficiency in Language Arts and Math

National Housing Trust Schools Technology Project

The National Housing Trust is currently planning to put one computer lab in a primary school in each parish over a two-year period. Primary schools not already equipped under the Edutech 20 project will be eligible for

[44] http://www.janc.org/downloads/IT%20Plan.PDF.
[45] See ICT Projects http://www.jamaica-lmis.com/jamprofile1.html for further details.

the grant. A number of schools have already been selected following a selection process. The Jamaica 2000 Foundation is advising the Housing trust on the right kind of software to equip the primary schools.

INTEC Fund

The Information Technology Project (INTEC) was to act as one of the primary foundation stones for the creation of an ICT industry in Jamaica. Funded by the auction of two cellular licenses by the Government in 2000, INTEC has provided J$234 million for the training of 10, 611 students in IT (4,460 graduating for a range of programmes with 2000 being placed in IT positions across Jamaica).

Table 6 : U. Tech. Graduates Computer & Related Studies 2000-01

Discipline	Degree	Associate Degree	Diplomas	Certificate	Total
Computer Management Studies	95				95
Computer Studies			71	55	138
		12			
Computer Engineering Technicians			13		13
Digital computer Technology				12	12
Business with Computing			15		15
Micro Computing Technology Practice				11	11
Engineering Technician- Telecommunications				12	12
Electronic &Telecommunication	8		40		48
Electric Power	12			23	12
Total	115	12	139	113	379

Source: MICT/Utech 2002

The HEART Trust has acted as project manager for the training component of the INTEC project. Under the guidance of HEART, the following has been achieved;

- Thirteen (13) training facilities have been established. Two hundred and fifty eight programmers have graduated from the programme to date, with graduates gaining employment at Indusa Global, MultiVisual, Overdrive and other local companies. See table 7.
- Five overseas instructors were recruited and seventeen local instructors trained and employed. Thirtyone trainee instructors are presently enrolled in an 18 month diploma course; and fifteen local instructors are being retrained for employment in Call Centres.
- A total of seven companies received training grants totalling approximately J$88 million, through HEART and the NIBJ. See Table 8.
- HEART expanded their training activities at nine of their outposts with the addition of 126 computers at a cost of just over J$8 million dollars.
- An additional 1800 HEART trainees completed programmes in level 1 IT, computer maintenance and Hardware, Telemarketing; and enrolled over 4200 persons in IT programmes with over 2600 completing their programme of study.

Information in Education Project

The National Commission for Science and Technology, a specialized department that advises the Office of the Prime Minister, is evaluating another project called the information in education project (ITI project), which has the remit of trying to get more technical English understood at the floor level in the workplace. The project aims to develop educational aids, which should become available by the 1st June (although delays in project management have held up the timetable for delivery). The ITI is looking at schools, and any language-based business, media houses etc. Project partners include the University of West Indies and the Jamaica Education Foundation.

At present, the ITI project is in its pilot stage, and has been funded by the Netherlands based IICD, which has a philosophy of investing in pilot developmental projects with the hope that successful pilots will better inform larger-scale follow-on projects. After problems with initial designs and having to create effective curriculum development plans, the ITI now has structures in place and is finalizing the initial pilot. The project could have great appeal because of the wide range of applications (eg telemarketing, media and schools). The ITI is now looking for further funding from development agencies (eg DFID, Carribbean Development Bank), and the main challenge is to convince the funding agencies that they have a successful template that can be repeated in other developing economies particularly in the Caribbean.

CISCO Academies

The GOJ is promoting Jamaica as an ICT country and has been successful in attracting support from both the UNDP and CISCO in setting up ten academies (at existing colleges of further education) throughout Jamaica for electronic networking. CISCO is to provide technical training education in electronic networking which will be managed by Jamaica's national training institution, HEART/NTA.

Table 7: Establishment of High End Software Training Facilities

#	Name	Public/ Private	Programme	# of Trainees per Cycle Planned/Graduated
1	EXED Community College	Public	CIT Programme	50; 41 with diplomas
2	Institute of Management & Production (IMP)	Private	CIT Programme	56; graduating class in February 2002
3	Info Serv	Private	CIT Programme	50; graduating class in November 2001
4	Brown's Town Community College*	Public	CIT Programme, now certifiable IT courses	50; by proposal from the College
5	Knox Community College*	Public	CIT Programme; now certifiable IT courses	50; by proposal from the college
6	Moneague Community College*	Public	CIT Programme; now certifiable IT courses	50; by proposal from the College
7	Montego Bay Community College	Public	CIT; now e-publishing course for Over Drive	5; 150 in e-publishing skills
8	Stony Hill HEART Academy	Partnership with CISCO, UNDP	CISCO Networking Associate	60; start up January 2002
9	Vocational Training Development Institute	Public	ICT Instructor Training & Short Professional IT courses	60; 31 in training
1	Montego Bay	Public	Data services;	30 per cycle

0	Information Technology Training Institute		Telemarketing	
11	International Training Institute (formerly IIPI)	Public	Level 1 IT and Call Centre Operations	30 per cycle
12	Jamaica Maritime Institute	Public	To support Multi-rating programme (5 computers)	
13	Rockfort VTC	Public	Call Centre training, Community based training, Web-master	100 per cycle

Source: Report to the Development Council (Status of the INTEC Project): 01/21/2002

Table 8: Training Grants to Jamaican Firms

Company	**Grant Allocated (JA$ equivalent)**	**Amount Disbursed (HEART or NIBJ)**	**Numbers to be trained/# trained to date**	**Numbers to be Employed/ Employed to date**
Jamaica Call Centre Ltd.	$14,002,900	$14,002,900 (HEART)	900; 649 to date	900; unknown
Teleservices Ja. Ltd.	$14,094,796	$2,180,431 (HEART)	1800; 787 to date	11,000 total over 3 years; 3 locations; 521 Mobay, approx. 250 Portmore (OJT)
Pathway Technologies Ltd.	$26,724,300 @(JA$45.8: US$1)	$26,442,180 @ combined rates via HEART	778; 687 to date	5,000 over 5 years; estimated 650
Netserv	$22,381,190 @ JA$45.8:US$ 1) + amount of $524,868 for certification	$22,381,190 (@ 45.8) by NIBJ + $106,260 by HEART for certification	382; 74 to date	10,000; 208
OverDrive	$4,835,375	$105,300 (HEART)	150; 24 to date	150; 18
Caytech	$2,594,202	None	200; none	400; none
Westcom	$1,500,000 plus an additional request of $1,355,500	$1,425,000 (HEART)	280; 215	220; 195
Total	**$88,013,131**	**$66,643,261**	**4,290; 2,436**	**27,450; 1,842**

Source: Report to the Development Council (Status of the INTEC Project): 01/21/2002

Extract of an interview with Avril Crawford, Executive Director of the Jamaica 2000 Foundation: THOUGHT PROJECT: "The Thought Project was conceived as an idea to link a number of primary schools throughout the island, and to enhance the use of ICT in learning. At the Ewarton Primary School for example in Clarendon, classes were divided into teams, and we had five teams of six kids. It was a science project, and the idea was for the kids to have different roles in the team each time they met. One time, the child would be the leader, another time, the child would become the scribe, and then the data gatherer. The children would go out into the field to do various assignments. The teams were given laptops and also allowed to take home the laptops. We quickly found that the local community became very involved with the use of the technology in the schools. The laptops came bare and so the parents quickly made bags for them and drew up a roster for the laptop use. And then the teacher found that she was bombarded with requests from the parents to use the laptops, when the kids when to bed at 8pm. The community felt a sense of ownership for the project, and they would give in "sweat money" to help get the project get up and running and to maintain the computer lab. We found that one of the best ways to raise money was to use the lab itself to raise funds for example by training the community in the evening; the teachers would spend their own time teaching adults in the use of basic ICT skills, with the teachers earning a small fee for their time. Some of the schools found that they could supply all the printing needs for their community (wedding invites, xmas cards, birthday cards etc). The Foundation has about 170 schools and about 80% of schools are doing this. In order to achieve all of this, most if not all the schools had to get over the fear of opening after hours, but having done this, the project proved to be a great success."

Source: Interview with Avril Crawford, Executive Secretary Jamaica 2000 Foundation February 2000

Networked Society

	Stage Two	Stage Two/Three
People and Organizations Online	Rural Jamaica, internet use is mainly concentrated in local schools and colleges, where access is mainly available through one or two PCs that are internet ready generally in the school's library. Some larger schools have computer labs equipped with PCs that give access to the net over dial-up modem lines.	According to Infochannel, a leading Jamaican Internet service provider, the number of users in Jamaica is estimated at around 150,000 maximum, although only around 80,000 have actual internet accounts. The age range of internet users is estimated to be between 22 to 45 years of age, with 45% of the user population being men and 55% women. There are fewer than two domains registered per 1000 inhabitants. To date the Postal Corporation of Jamaica has received $31M from the INTEC Fund. This grant has enabled the Corporation to refurbish 44 post offices and to equip these offices for IT-based commercial services. Cable and Wireless has offered to place Internet Kiosks in 60 post offices, of which 26 to-date are able to offer Internet and email services.
Locally Relevant Content	There is a certain amount of content that focuses on rural Jamaica. The main drivers for this growth in local content has been the tourism industry and also agriculture. The Netherlands based development agency IICD has a number of pilot projects that look to develop local content for the rural sector including the Agri-Business Information System which links small farmers in Jamaica with buyers, and provides information on seeds, obtaining credit, and domestic and export markets. The project is run in conjunction with the Rural Agricultural Development Authority (RADA).	Urban Jamaica has a wide variety of sites serving local needs together with a range of B2C and B2B virtual marketplaces. There are however relatively few cybercafes; (around 6) in Kingston, the capital, with others located in the tourist centers of Montego Bay, Orcho Rios, and Negril.
ICTs in Everyday Life	Rural Jamaica Generally, the rural parishes are served reasonably well by public telephone boxes (through C&WJ). However fixed-line telephone penetration varies greatly between the rural parishes. A handful of projects are expanding Internet access into rural areas (mainly agricultural through RADA), with limited success. Most communication is either paper-based or oral.	Urban Jamaica, the two largest ISPs in Jamaica (C&WJ and Infochannel) are both active in trying to encouraging students still at school to get onto the internet. There are 144 high schools in Jamaica, and 80% of the students from these schools are graduating internet aware. Under the INTEC program, between 40-50 post offices in Jamaica have been equipped with internet access (see Table 10), with C&W being the primary contractor for the post office kiosks. Penetration of cellular accounts is almost as high as the number of fixed-lines in Jamaica (see Network Access section), and this new use of technology (SMS messaging for example between Jamaican students), might lead to a take-up of other ICTs.
ICTs in the Workplace	Rural Jamaica Most businesses have limited access to telephones and fax. Most business communication takes place in person or by mail.	Some Jamaican companies give employees internet access (internal and external e-mail communications). Less than 25% of all businesses incorporated have virtual private networks,, and generally only usually those with revenues in excess of J$1bn (50% of these will be networked).

People and Organizations Online

According to Infochannel, an Internet service provider, the number of users in Jamaica is estimated at around 150,000 maximum, although only around 80,000 have actual internet accounts[46]. The reason for this is that many get internet access at work and do not have a PC at home. Also a number of users share one account, which makes it very difficult to access exactly the number of real subscribers. There is also a problem with low teledensity in the rural areas and adequate access to telephone lines. The age range of internet users is estimated to be between 22 to 45 years of age, with 45% of the user population being men and 55% women, which goes against the trend in developed countries of a higher male user base. The main reason cited for the larger female user base is cultural. In Jamaica, women tend to be better educated on average than men. Approximately 67% of the civil service is composed of female employees[47], at the University of West Indies, the male to female ratio across all faculties is a staggering 30:70 (the faculty staff ratio being quite the opposite at 60:40)[48].

To date the Postal Corporation of Jamaica has received $31M from the INTEC Fund. This grant has enabled the Corporation to refurbish 44 post offices and to equip these offices for IT-based commercial services. Cable and Wireless has offered to place Internet Kiosks in 60 post offices, of which 26 to-date are able to offer Internet and email services. The locations equipped with internet ready services are shown in Table 3 above.

The Postal Coorporation of Jamaica (PostCorp) is currently trying to conclude the installation of the remaining internet ready kiosks contracted with C&WJ and is also looking to negotiate a further 60 kiosks. Discussions are also underway with C&W with a view to making kiosks more user friendly and equipping them with a printing facility so that they will be useful to students, (the primary target group) for research and the preparation of school assignments.

Another objective for PostCorp this year is the assignment of e-mail addresses to post office customers (Under the 5 year ICT strategic plan, every citizen in Jamaica should have an e-mail address by 2002) . Under this plan the post office could be authorized to download e-mail messages and place them in envelopes for customers in cases where customers do not wish to use the facility themselves.

PostCorp also plans to automate the post office counters. This would result in post offices being on-line to the accounts department and to the servers of its commercial clients, enabling real-time transactions and greater efficiency and cost saving. It will also reduce the burden on staff currently operating with a manual system. To deal with the new technology, PostCorp is expected to receive funding from the INTEC fund for the training in computer skills necessary for postal workers working at the ICT enabled post offices.

Locally Relevant Content

There are fewer than two domains registered per 1000 inhabitants[51]. The leading ISP in Jamaica, Infochannel, second only to C&WJ, argues that there are not sufficient websites covering local issues. For example, at present Chat groups and on-line bulleting boards are not commonplace in Jamaica, although national newspapers such as The Gleaner have moved on-line. According to Patrick Terralonge, the Managing Director of Infochannel, the reason for this is mainly apathy because there is not enough critical mass of interest. Casino gambling and horse racing is currently illegal and on-line gaming is not very successful. By contrast the business community is fairing better with locally available content. The Jamaican Tradepoint program, which creates an

[46] However, there are different estimates on numbers. The Jamaican Gleaner for example estimates the *number of people* (and not registered users of internet accounts) using the internet in the last three months to have been between 170,000 to 200,000.
[47] *Ibid*.
[48] Interview with the University of West Indies, February 2002.

[51] Interview with Patrick Terralonge, Managing Director, Infochannel (ISP), February 2000.

on-line presence for Jamaican business (a virtual shopping mall) is gaining both active participation from the local business community and strong support from government.

There is limited content that focuses on rural Jamaica. The main driver for this growth in local content has been the tourism industry and also agriculture. The Netherlands based development agency IICD has a number of pilot projects that look to develop local content for the rural sector including the Agri-Business Information System which links small farmers in Jamaica with buyers, and provides information on seeds, obtaining credit, and domestic and export markets. The project is run in conjunction with the Rural Agricultural Development Authority (RADA).

Urban Jamaica has a wide variety of sites serving local needs together with a range of B2C and B2B virtual marketplaces. There are however relatively few cybercafes (around 6) in Kingston, the capital, with others located in the tourist centers of Montego Bay, Orcho Rios, and Negril.

ICTs in Everyday Life

The two largest ISPs in Jamaica are both active in trying to encouraging students still at school to get onto the internet. There are 144 high schools in Jamaica, and according to Patrick Terralonge the Managing Director of Infochannel, 80% of the students from these schools are graduating internet aware. Under the INTEC program, between 40-50 post offices in Jamaica have been equipped with internet access (see Table 3), with C&W being the primary contractor for the post office kiosks. Penetration of cellular accounts is almost as high as the number of fixed-lines in Jamaica (see Network Access section), and this new use of technology (SMS messaging for example between Jamaican students), might lead to a take-up of other ICTs.

Table 9: Internet Cafes in established_Post Offices

LOCATIONS	STATUS	LOCATIONS	STATUS
Constant Spring	functional	Yallahs	Machine placed not yet functional
Cross Roads	"	Falmouth	"
General Post Office	"	Central Sorting Office	"
Greater Portmore	"	Christiana	Machine to be Placed
Linstead	"	Bamboo	"
Morant Bay	"	Darliston	"
Port Antonio	"	Jones Town	"
St. Ann's Bay	"	Mile Gully	"
Waterford	"	Black River	"
Western District	"	Buff Bay	"
Windward Road	"	Cambridge	"
Annotto Bay	"	Half Way Tree	"
Mandeville	"	Lawrence Tavern	"
Denham Town	"	Mona	"
Lucea	"	Old Harbour	"
Negril	"	Salt Spring	"
Montego Bay	"		
Port Maria	"		
Sav-la-mar	"		
Orcabessa	"		
May Pen	"		
Tower Isle	"		
Balaclava	"		
Whitfield Town	"		
Allman Town	"		

Source: Report to the Development Council (status of the INTEC project) 02/21/2002 App. 7

ICT's in the Workplace

Jamaican companies have not moved very far in giving employees internet access (internal and external e-mail communications). Less than 25% of all businesses incorporated have virtual private networks, and generally only usually those with revenues in excess of J$1bn (50% of these will be networked). Businesses that usually have extranets set up are almost always international companies[53].

[52] This is one of IDRC's ACACIA projects. The IDRC is a Canadian government agency.
[53] Information based on an interview with Patrick Terralonge, Managing Director, Infochannel (ISP), February 2000.

Networked Economy

	Stage One	Stage Two	
ICT Employment Opportunities	Rural Jamaica Employment opportunities are concentrated in the post offices and supermarkets, some of which are equipped with ICTs. A substantial number of rural primary and secondary schools are now equipped with computer labs, although only the larger schools can afford to employ a computer technician who will also generally double-up as a teacher.		**Stage Three** Urban Jamaica There is a vibrant market for the employment of ICT professionals, particularly given the downturn in the US market and the slowdown in engineers moving abroad. The government has been successful in creating over 4000 jobs through the Information Technology Project (INTEC) in the last two years.
B2C Electronic Commerce	Rural Jamaica Very few businesses in the community operate websites. There is little awareness of online business and most dealings between businesses and consumers consist of oral and/or paper based transactions.	Urban Jamaica: **Stage Two/Three** There are many local businesses with websites, but information is static and infrequently updated. Two to three banks accept limited online transactions. Fax is still extensively used to place orders. Documents received by fax or email are not legally valid, although new legislation is being drafted to overcome this problem.	
B2B Electronic Commerce	Rural Jamaica Businesses have few sources of market information. The efficiency of most B2B interactions is hampered by a lack of transparency, as are prospects for new business opportunities.	Urban Jamaica: **Stage Two** Most B2B interactions are being led by government, although there are a few B2B commercial exchanges located mainly in Kingston. Most transactions between smaller businesses are paper based, or through fax and telephone.	
E-Government	Rural Jamaica Very few government resources online. There is little awareness of e-government, and all dealings between government and citizens or businesses are in person or paper based. However the situation is beginning to change with IICD-led projects in agriculture and farming	Urban Jamaica: **Stage Two/Three** There are many government websites, though most are static and not transactional. MICT and the Ministry of Land and Environment are pushing transactional sites for import/export and land registration procedures. The Government is also planning to deliver a number of services through a single-stop governmental portal and to modernize a number of ministries through a Central Information Technology Office (part of the Office of the Prime Minister).	

ICT Employment Opportunities

Over the last 18 – 24 months, the Jamaican IT industry has experienced growth, the catalyst for which has been the deregulation of the telecommunications industry, introducing new entrants in the mobile cellular market, domestic voice and data services and Internet service provision. Additionally, the reduction in telecommunications rates, which has been driven by liberalisation, has fostered growth in export-oriented services. Jamaica now boasts a wide range of IT services, from data processing to call centres, to e-publishing to software development. These new services have created linkages to other industries, such as training and have indirectly contributed to growth and employment in the economy through the construction, retail and catering industries.

Employment in Jamaica

Sector	%
Services	60
Agriculture	21
Industry	19

Source: The World Factbook-Jamaica 200

The government decided to place emphasis on sectors within the IT industry that would create relatively high employment, targeting:

- Call centres
- Software development
- Telecommunications (driven by the liberalisation of the industry in 2000)

As mentioned earlier in this report, the Information Technology (INTEC) Project, which is now at the end of the third quarter of its second year, has been the main driving force for job creation in the ICT sector. The INTEC fund became possible with the auctioning of cellular licenses in December 1999, and with the understanding that part of the proceeds of the $3.9 billion raised in the auction would be used to develop the IT sector in Jamaica. The main objectives of the INTEC project are:

- The creation of jobs for short-term tangible results, with a target of 40 000 jobs starting with 8,000 in year 1 (2000), 12,000 in year 2 (2002) and 20,000 in year 3 (2003).
- The training, retraining and strengthening of Jamaica's human resource, and providing access to technology, in order to facilitate life-long learning and support the development of a knowledge-based society.
- The support of entrepreneurship and the creativity of the community in order to develop a local information technology industry

The Ministry of Industry, Commerce and Technology (MICT) has overall responsibility for the management of the INTEC project, which is structured into several different components:

- **The Infrastructure Improvement Fund**, for providing office space for IT-related Projects such as Call Centres. This includes the Information Technology Loan Fund managed through the National Investment Bank of Jamaica (NIBJ); and the grant fund managed for refurbishing of existing factory space, which is managed by the Factories Corporation of Jamaica (FCJ).
- **The Venture Capital Fund,** includes support for small businesses. Disbursements were made through the Self Start Fund (SSF) and the Technology Investment Fund (TIF). Our understanding is that, at the time of writing, the venture capital fund has now been totally exhausted and the MICT is looking to create a further venture capital fund with the help of the development banks. At present, the banking sector is reluctant get involved in Venture capital, and instead the government

would like to work with financiers who understand concepts such as the use and management of intellectual property. However a positive sign is that some banks have been asking for information from the MICT on how the Venture Capital Fund was created so that they themselves can budget for a potential VC fund in the next financial year.

- **Human Resource Development Fund** to build the knowledge based society, which is managed primarily by HEART Trust NTA (HEART).
- **Community Development Fund**, including the establishment of IT access points, which is managed through the Social Development Commission, the National Youth Service with support from HEART, and the Postal Corporation of Jamaica.
- **ICT Development Fund**, including the establishment of a legislative framework for electronic business, which is supported by preliminary work done through the Workforce Development Consortium, the University of the West Indies and the Electronic Advisory Committee of the Ministry of Industry, Commerce and Technology. The GOJ is currently consulting with industry on a draft E-Commerce Policy, which it hopes to publish later this year, some of the principles of which has been discussed earlier in this report (see Network Policy)
- **Promotions and Marketing**, managed through Jamaica Promotions Corporation (JAMPRO).
- **Project Management & Administration**, which is the responsibility of the MICT.

Total funds allocated under the Infrastructure Fund from inception to date, total approximately J$862 million. Of this amount J$759 million was allocated for the infrastructure loan fund, with approximately J$73 million being provided to the FCJ. J$42 million was disbursed in respect of venture capital/small business support, with J$225 million being provided for human resources development. J$80 million supported community development including retraining, while J$66 million was disbursed in respect of promotions and marketing. Approximately J$39 million supported project management, including the establishment of the Central Information Technology Office (CITO) and the development of the strategic IT Policy[54].

The infrastructure fund has led to the creation of 4000 jobs in the IT sector. According to the Report to the Developmental Council (Status of the INTEC Project 2002), ninety percent of staff work as telemarketers, with ten percent being accounted for as auxiliary, managerial and clerical staff. The average salary is J$4000 per week which includes incentives such as lunch, uniforms, and health care. Table 5 details the jobs created to-date.

One of the biggest problems in Jamaica is being able to retain the IT professionals that are trained. Historically, the US has bid up the wages for skilled ICT professionals and so many Jamaican engineers have gone abroad to seek better salaries. HEART and CIT have recognized this problem and the Jamaican government's approach is

[54] Information taken directly from the Report to the Development Council: Status of the INTEC Project 01/21/2002.

to increase supply. CISCO academies, the University of West Indies and the University of Technology, and various lower level application training institutes creating trained technicians mainly at the lower end (number of low end trainers have increased dramatically, particularly for productivity tools) are increasing the numbers of graduates being trained, although Jamaica cannot hope to compete with a country the size of India, which produces over 10,000 IT graduates annually compared to Jamaica's 200-250 graduates[55]. At present, there is no critical mass at the high end for programmers working with designing code for example, which means that Jamaica is not as competitive to India in the design of code, but can nevertheless compete effectively as an ICT off-shore center for technology-enabled businesses, particularly call centers and customer relationship management. In this respect, Jamaica has a number of advantages that transcend its disadvantages; proximity to the US, good English speaking ability, a high number of high school educated employees (more female than male), good connectivity with market costs dropping monthly for that connectivity, and quite importantly, the country is a pleasant place to live in (notwithstanding the high crime rate in areas, such as the Kingston metropolitan area). Business executives can hop from Jamaica to Miami in two hours, and maybe for these reasons in almost 18 months, Jamaica has built up an industry in off shore business processing; debt collection, very simple programming Java based web programming, customer relationship management, data processing—high end processing, clipping of ads and sending back data for market analysis, off-shore betting center. In off-shore debt collection alone, several hundred people are employed (Jamaicans calling back to North America reminding people to pay their debts!).

Table 10: Direct Job Creation

#	*Approved Projects*	*Technology*	*Jobs*				*Space/ square metres*	*Start date*	*Approved J$ '000*	*Amt. Disbursed J$ '000*	
			Over 3 yr	*To Date*	*Seat No.*	*Two shift*				*Total*	*Per Seat*
1	Kingston Free Zone for Jamaica Call Centre Limited	Telemarketing outbound (satellite)	5000	150	200	400	4100	Jun '01	64000	64000	320
2	Netserv Comm. (Ja) Ltd	Telemarketing outbound (satellite)	10000	209	471	942	2600	Aug '01	180000	177196	376
3	Baytel - FCJ	Information Processing	150	120	200	400	1500	Jul '01	35000	35000	175
4	Pathway Technologies	Telemarketing outbound (satellite)	6000	-	288	576	1800	Dec '01	153000	106290	369
5	Teleservices (Jamaica) Ltd	Telemarketing outbound (satellite)	14000	900	700	1400	4500	May /Nov '01	226000	226000	322
6	Teleconnections Ltd (Comtech)	Teleservices	1200	-	400	800	1800	Mar '02	128025	0	320
7	Caytech Call	Teleservices									

[55] Interview with New Economy Project, February 2002.

	Centre		1396	0	410	900	2000	Mar '02	59200	25000	144
8	Overdrive Jamaica Ltd.	e-Publishing	160	20	20	40	120	Mar '02	22600	0	1130
9	Westcom	Telemarketing outbound/ inbound (wired/JDI)	300	216	100	216	1400	May '01	4800	4800	48
	Total		**38206**	**1615**	**2789**	**5674**	**19820**		**915825**	**681486**	**3204**

Source: MICT Report to the Development Council 2002

Electronic Commerce

Unlike many developed economies where it is the private sector that has spearheaded the take-up of e-commerce with government having to play catch-up, in Jamaica, it is government as the largest procurer and supplier of services that is intending to lead by example with the take-up and delivery of e-commerce services by creating an one-stop internet portal for all Government information and services, and the use of electronic signatures for transactions.

Some government agencies are already on-line including the Office of the Registrars of Companies, and JAMPRO through its Trade Point Project. Soon (although no specific date has yet been defined), the GOJ hopes that consumers will be able to pay their taxes and procure government services on-line. The government also intends to develop a Government Public Key Infrastructure to enable the secure electronic transactions of government services. The government also recognizes the important role that SMEs play in creating an e-commerce industry and is targeting the already successful music industry and the software industry for promotion, the latter being encouraged to develop cryptographic products and services for use by local Jamaican businesses.

There are also a number of private sector e-commerce initiatives:

- *Paymaster*: a private bill payment agency, which is spearheading the rationalization of all utility bills into one on-line bill. The idea is that instead of going to each utility company to pay bills, consumers can go to one point to pay all bills. Paymaster has 30 different companies on their books, with over 10,000 customers who have used Paymaster to make payments to these 30 companies. Paymaster is a private company with banks as external investors. The USAID funded NGO, the New Economy Project (NEP) is advising Paymaster on all technical issues to do with software and system implementation by way of development aid through USAID. The NEP is injecting US$160,000 (in the form of technical assistance and consultancy and not an actual grant) with Paymaster injecting US$700,000. At present, Paymaster does not have business acumen or expertise to go through a major reengineering, but after system implementation, the hope is that Paymaster will be able to standalone. The company, which has over a 100 locations throughout Jamaica also wants to collect government revenues for land taxes (currently the government has 20 locations where these payments can be made). The NEP is helping Paymaster by funding a project manager, reengineering the business processes, helping with the documentation, selection, and implementation of a new IT system.
- *Grace Kennedy Financial Services* (remittances and bill collection)
- *The banking sector:* ATM credit and debit card "connection" agency JETS. The banking sector is focusing on three specific initiatives, an automated clearing house, a credit bureau, and a central securities tracking system. The Life Insurance and General Insurance (Property and Casualty) industries have put in place anti-fraud computer systems based on data sharing. Scotia Bank and Citibank have initiated support systems for on-line payments. Many Jamaicans can purchase on the internet using US$ credit cards, although the use of J$ credit cards to make on-line purchases is still extremely rare due to the lack of a settlements mechanism with US banks (although this is soon to change). To date, Jamaican banks have issued 750,000 debit cards, and automated banking machine usage has grown by 27% per annum [56].
- *On-line C&W Yellow Pages*

[56] Source: Interview with the New Economy Project February 2002.

- *Websites for a number of hotels (Half Moon, Sandals etc)*
- *BCIC selling insurance on-line*
- *The life insurance impairment registration system (B2B)*
- *The P&C insurance claims registration system*

Historically the Banking industry has been reluctant to get involved in e-commerce in Jamaica. For banks in Jamaica to use any sort of e-payment service, they have to use third party software, which generally means paying prohibitive license fees for the use of such software. Given that the number of internet subscribers are currently estimated to be around 150,000[57], the costs for putting in place e-processing gateways do not match the benefits, and very few of the banks' business clients are demanding this kind of service. The force to encourage local banks to take up more ways of delivering electronic services has to come from local demand. We understand that as far back as 1990/1991, banks were offering on-line account access to corporate customers, and to-date, a number of bills can now be paid using the keypad on a telephone. Some banks have also recently extended opening hours to accommodate user/bank interfacing while simultaneously trying to encourage the increased use of ABMs.

E-Government

The government has set out a number of proposals in its National Strategic Information Technology Plan (Five Year Plan) for e-government in Jamaica. The Five Year Plan states:

> *"A series of high profile pilot projects must be undertaken which can demonstrate the benefits of IT in the short-term. These projects should further the government's goal of universal access to the technology and emphasise public access to information"*

Although the Five Year Plan does lay the foundation for a number of projects, it lacks critical "target applications" with integration specifications, resource requirements (hardware, software, operating environment and communications). The plan also fails to detail human resource plans, implementation targets, timeframes and costs.

Whatever the shortfalls in the Plan however, the GOJ has succeeded in starting a number of pilot projects in the area of e-government. The Ministry of Local Government and Community Development is currently reforming its operations under the Local Government Reform Programme. Under the Public Sector Modernization Programme, the aim is to modernize 17 pilot agencies and 3 pilot ministries with network access and e-mail provision. The Office of the Prime Minister is spearheading the effort through its recently created Central Information Technology Office (CITO). CITO receives funding for operational support from the International Development Bank (IDB).

Some ministries are more advanced in the use of ICTs than others. The MICT is generally well networked with most civil servants having access to individual e-mail accounts and a LAN in place. The Jamaican Export Ageny (JAMPRO), which works very closely with the MICT has put in place its Trade Point Jamaica website, which puts on-line a number of Jamaican businesses. The Office of the Prime Minister is also well equipped with ICTs. However not all ministries have access to adequate ICTs or lack sufficient training to make good use of the ICTs available. For example, not all civil servants within the Ministry of Education have their own e-mail address, although each unit within the Ministry has a group e-mail account that serves the unit as a whole. There is no centralized e-mail server and most communication is by fax and telephone. There is no internal intranet although there are plans to install one, which will also link the ministry with schools and major colleges. The Ministry of Education has over 250 education officers, of which just over one third has been trained in using a PC. One of the main problems faced in encouraging the use of ICTs has not been the adequate access to computers, as one would expect, but culturally, in encouraging the workforce to use the technology available, and this is in part due to a lack of adequate training resources.

[57] Source: Interview with Patrick Terralonge, Managing Director, Infochannel (ISP), February 2000.

Other Ministries are also active in the use of ICTs. The Ministry of Land and Environment is developing a Geographic Information System database, which it hopes to share with other Ministries. The National Land Agency is also moving to Executive Agency Status (becoming more customer orientated). The Land Agency manages the public record regarding land, but has limited capacity to provide information to business and consumers. With the technical help from the New Economy Project (NEP[58]), the Land Agency is now planning to deliver web access to the public record. The NEP is taking the Land Agency's digital records and making them available to subscribers via a website. At the time of writing, the site is not yet transactional, but the plan is to move from an agency with a static website to one that is dynamic; pushing titles, mapping data, pushing location data (similar to land agencies in the US and UK). Jamaican government is investing resources in creating the digital records, whilst the NEP is designing the customer facing side of the site and is underwriting the software costs for the user interface. The site is targeted at attorneys, real estate professionals, banking community (over 100,000 mortgages are processed in Jamaica each year).

The NEP is also assisting with an e-commerce project to make the import customs procedure more efficient with Jamaica Customs. The project is helping to connect together the government's data processing agency, Fiscal Services Limited (which develops and operates computer applications for government), the Customs Agency, Nova Scotia Bank, and 16 customs brokers on a pilot basis to pilot a system for electronic payment for commercial imports. In this way, instead of importers having to go to the bank, obtain a managers cheque to give to customs, and then wait a number of hours at the customs office for a receipt confirming payment that can be shown at the wharf where the goods are stored, the importer can now sit in his/her office and complete the transaction over the internet, print the payment verification, and then go the wharf to collect the goods, a considerable saving in time.

Another development in e-government is with the pilot project in Portmore, which is at the time of writing still in its embryonic stages. Portmore is a large urban community located in South-Eastern Parish of St Catherine. Over the last twenty years its population has tripled growing from 82,000 to an estimated 250,000. Because the area is urbanizing so quickly, with land taken out of farming, many problems have surfaced in environmental and community planning. As a result, the Portmore Municipal Development Committee made up of stakeholders in the Portmore community is receiving government support for developing a community-based system called the Portmore Telecity Network (PTN), which will make use of ICTs to develop effective governance by improving communications between government, the community and the private sector in the community. With the guidance and support of the National Council for Science and Technology, the Netherlands based IICD is funding two consultants to support the preparation of project proposals. Good use has already been made of the existing high teledensity and cable penetration rates in Portmore, one of the main reasons why it was selected as a pilot for e-governance. Also a major lesson from the pilot to date has been realizing the crucial input of community based organizations and contributions from the community.

SMEs

A major obstacle for SMEs starting up business in the e-commerce arena is access to good quality credit. The high interest rates of over 20% (averaging 17-30%) provide a poor investment climate. An international investor with a local presence in Jamaica (eg IBM) wanting a term loan, and wanting to leverage its industry contacts and its capabilities to invest in Jamaica, and take advantage of the competitive advantages, such as free zones, a trained workforce etc., will have real problem starting any business with borrowed capital. At present, the capital markets are very shallow with high government debt chasing out any other kind of investments. The government is borrowing so heavily in the local market and paying such a high premium for this debt, that other borrowers are finding it difficult getting loans at competitive interest rates. Consequently, growth in Jamaica has been stifled for a very long time because of macro economic conditions.

[58] The NEP is funded by USAID and has as its remit to provide technical expertise to businesses and government in Jamaica.

However, not all is bleak for SMEs. The Technology Innovation Center, a department of the University of Technology does provide services to small businesses to assist in the start-up phase of operation. The TIC has five strategic business units:

- an incubator that provides office space for 29 businesses
- a training unit
- an information services unit
- a businesses services unit
- an administrator

TIC has been on the University of Technology campus since 1987 and targets start-ups and new businesses. However the TIC is only beginning to develop the expertise required to assist SMEs in finding access to good credit and venture capital. Technical expertise is on hand through mentoring programs with experienced industry figures together with access to the technical facilities of the University of Technology, which includes the high speed Local Area Network and VoIP CPE equipment.

The New Economy Project (NEP) has also been working with a private company, Management Control Systems (MCS.com) in Jamaica to provide payroll and tax services to SMEs. The idea for the payroll service is that small companies with perhaps ten or less staff may not be able to afford to run an in-house payroll service and also cannot justify the expense for dedicated payroll software. MCS decided to create MCS.com which is an application service provider offering a remote payroll service. Using the services of MCS, an owner of a small gas station can for example complete his payroll needs by connecting to the internet at home. With the use of a home printer, he can also print his payslips or MCS can print them for him and have them delivered by post. If he wants the banks to transfer wages to his employees, MCS will provide the necessary payroll information to the banks for book transfers, and at end of each year deliver the tax-return form per employee. In terms of funding the project, the NEP is providing US$90,000 in consultancy and technical services, with MCS funding US$400,000-500,000. The project will serve a projected market of around 2000 to 2500 firms in Jamaica. For 90,000 NEP can deliver benefits to 3000 firms.

Summary of Findings

One may summarize the main findings of the assessment as follows:

1. Network Policy:

The implementation of the *Telecommunications Act 2000* must be one of the greatest achievements of the Ministry of Industry Commerce and Technology (MICT). The Act allows for a three- phase transition towards a fully liberalised market and gives authority to the newly created Office of Utilities Regulation (OUR) to regulate not only the incumbent but also the new entrants to the market. The first phase of liberalization was completed with the signing of a Heads of Agreement with C&WJ in September 1999, allowing for an end to the monopoly of C&WJ. At present 29 licenses have been issued since Phase II began in September 2001. Phase III is scheduled to commence in March 2003, when C&W's last monopoloy industry, international services, will become fully deregulated and open to competition, *although the GOJ is known to want to bring this date forward*. There are no trade barriers for the import of ICT equipment in both hardware and software into Jamaica. CPE equipment has been fully liberalized. In January 2001, the GOJ published a Five Year IT strategic plan in which it sets out its vision for facilitating the use of ICTs in Jamaica. This year, the government is set to release a draft E-Commerce Policy, which will include plans to introduce digital signature and privacy laws, laws on computer misuse, and laws for consumer protection. There is however a great need for government to lead by example in terms of adoption of e-commerce. Furthermore, the Five Year Strategic Plan contains too many recommendations, and lacks specific implementation timetables with detailed prioritized items, budget outlines, and the reasons for priorities set out[59].

2. Network Access:

Access to telecommunications infrastructure is generally good in most urban centers with a national teledensity of 23 lines per 100 people (500,000 fixed lines in total). However,rural parishes are not served as well by the incumbent as urban parishes with longer wait times for fixed-line access (sometimes up to two months). The number of mobile subscribers is estimated at 475,000 meaning that mobile penetration will at some point soon overtake fixed-line penetration. Only C&W and Infochannel currently have points of presence in each of the 14 Jamaican parishes. There are 22 licensed ISPs in Jamaica with 15 of them currently operational. The total number of internet subscribers is estimated to be around 150,000, although many users share accounts. With the high level of competition in Jamaica for internet service provision, prices for internet access are in line with OECD rates. However, the above cost of leased-line provision is still continuing to inflate both access and usage prices, and an important driver for change will be a push by the regulator for cost-based leased-line provision and interconnection tariffs from C&WJ.

3. Networked Learning:

Computers are to be found at the university, secondary, and primary school level. Equipment tends to be fairly new, particularly at the university level. Networked labs get Internet connectivity through a dial-up connection to the Internet. Computers are available in 170 out of 250 high schools throughout Jamaica, and are used mostly to support traditional work and study, with teachers using PCs for word processing and potentially some research on the Internet. There are limited opportunities for training in ICTs in rural areas, although the urban communities are served well. A range of tertiary institutions offer courses in high-end programming, graduating around 250 students per year**.** Schools and colleges should be encouraged by the Ministry of Education through a formal collaboration plan to work closely with the leading Jamaican ISPs, particularly C&WJ and Infochannel to develop more bulletin boards and information resource sites targeted at the local community. ISPs should also be encouraged to provide sliding scale hosting rates to schools for the hosting of school websites. In this way, schools can reach out to past alumni for fundraising and educational mentoring programs for example.

[59] The MICT does however point out that the Five Year Plan is only a framework document at this stage.

4. Networked Society:

According to Infochannel, a leading Jamaican Internet service provider, the number of users in Jamaica is estimated at around 150,000 maximum, although only around 80,000 have actual internet accounts. The age range of internet users is estimated to be between 22 to 45 years of age, with 45% of the user population being men and 55% women. There are fewer than two domains registered per 1000 inhabitants[60]. The government is trying to increase the use of the internet throughout the island, and has stated in its strategic five year plan that it wants every Jamaican citizen to have an e-mail account by year end 2002. One way, it is pushing increased access is through the national network of post offices. To date the Postal Corporation of Jamaica has received $31M from the INTEC Fund. This grant has enabled the Corporation to refurbish 44 post offices and to equip these offices for IT-based commercial services. Cable and Wireless is under an exclusive contract to place Internet Kiosks in 60 post offices, of which 26 to-date are currently able to offer Internet and email services.

5. Networked Economy:

Throughout urban Jamaica, which includes the tourist resorts and the cities of Kingston (the capital) and Montego Bay, there is a vibrant market for the employment of ICT professionals, particularly given the downturn in the US market and the slowdown in engineers moving abroad. The government has been successful in creating over 4000 jobs through the Information Technology Project (INTEC) in the last two years. However rural Jamaica paints a different picture with very few businesses in the community operating websites. For example, there is little awareness of online business and most dealings between businesses and consumers consist of oral and/or paper based transactions. Also there are few rural government resources online. There is little awareness of e-government, and all dealings between government and citizens or businesses are in person or paper based. However the situation is beginning to change with The International Institute for Communication and Development (IICD[61]) led projects in agriculture and farming. Also, in terms of generating innovation, the government needs to take a very close look at its dwindling venture capital industry to stimulate entrepreneurship. For example, a major obstacle for SMEs starting up business in the e-commerce arena in Jamaica is access to good quality credit. The high interest rates of over 20% (averaging 17-30%) provide a poor investment climate. An international investor with a local presence in Jamaica (eg IBM) wanting a term loan, and wanting to leverage its industry contacts and its capabilities to invest in Jamaica, and take advantage of the competitive advantages, such as free trade zones, a trained workforce etc., will have real problem starting any business with *borrowed capital*. At present, the capital markets are very shallow with high government debt chasing out any other kind of investment. The government is borrowing so heavily in the local market and paying such a high premium for this debt, that other borrowers are finding it difficult getting loans at competitive interest rates. Consequently, growth in Jamaica has been stifled for a very long time because of macro economic conditions.

[60] *Ibid*.

[61] The IICD assists developing countries to realise locally owned sustainable development by harnessing the potential of information and communication technologies (ICTs).

Appendix A Acronyms

MICT: Ministry of Industry, Commerce and Technology
NEP: New Economy Project
UWI: University of West Indies
UTECH: University of Technology
CITO: Central Information Technology Office
OPM: Office of the Prime Minister
C&WJ: Cable & Wireless Jamaica
PostCorp: Post Office Corporation of Jamaica
IICD: International Institute for Communication and Development
DFID: Department for International Development (UK)

[62] *Ibid*.

Appendix B Websites

Jamaica Maps
Cable & Wireless Jamaica
Directory of Jamaican Web Sites
Export Jamaica - List of Publications & Services
Jamaica (Academic Resources)
Jamaica Government Ministries
Jamaica Government Organisation Chart
JAMAICA ICT DEVELOPMENT
Jamaica Manufacturers' Association
Jamaica News
Jamaica Research Home
Jamaica Web directories
Jamaica, Education
Jamaican Consumer Affairs Commission
Jamaican Government Links
Jamaican Internet Services
Jamaican ISPs
Jamaican Sites Subject Index
Jamaican Telecoms Act 2000

Telephone Service Rates

Revised November 1, 2001
(GCT NOT INCLUDED)

1. EXCHANGE LINE RATES (MAIN LINE & PBX TRUNKS)

	BUSINESS	RESIDENTIAL	
		STANDARD	LOW USER OPTION*
	$	$	$
Installation	**940.00**	**660.00**	**660.00**
Rental	**740.00**	**310.00**	**140.00**
Reconnection	420.00	300.00	300.00
Relocation of Master Jack	600.00	400.00	400.00

To which rates under 5.1.2 of this schedule apply.

2. NATIONAL & INTERNATIONAL TOLL FREE LINES

	DOMESTIC	INTERNATIONAL
	$	$
Rental	**740.00**	**740.00**
Installation	**940.00**	**940.00**
Deposit	1,000.00	2,000.00
Reconnection	420.00	420.00

3. DIRECT INWARD DIALLING (DID) LINE

	DOMESTIC
	$
Rental	1,000.00
Installation	**940.00**
Reconnection	420.00

4. FOREIGN EXCHANGE LINE

	Intra-Parish	Inter-Parish
	$	$
Rental	9,165.00	14,000.00
Installation	9,227.00	9,227.00

Reconnection	420.00	420.00

5. USAGE RATES

5.1 DOMESTIC USAGE

5.1.1. *Standard* - Calls Dialled Directly by the Customer (Per minute or part thereof)

	Full $	Reduced $	Weekends $
Intra-Parish	**0.24**	**0.21**	**0.19**
Inter-Parish	**0.96**	**0.71**	**0.53**

The first 60 minutes of intra-parish calls per line per month are free.

5.1.2. *Low User Option* - Calls Dialled Directly by the Customer (Per minute or part thereof)

	Full $	Reduced $	Weekends $
Intra-Parish	**0.51**	**0.44**	**0.35**
Inter-Parish	**1.51**	**1.22**	**0.81**

The first 60 minutes of intra-parish calls per line per month are free.

5.1.3. Collect Calls (Intra- & Inter-parish)

Surcharge (per call) $	First 3 Minutes or part thereof $	Additional Minute or part thereof $
20.00	3.30	1.10

5.2 DOMESTIC TOLL

FREE USAGE (Per minute or part thereof)

	Full $	Reduced $	Weekends $
Intra-Parish	**0.51**	**0.44**	**0.35**
Inter-Parish	**1.51**	**1.22**	**0.81**

5.3 FIXED LINE TO MOBILE

5.3.1 Calls to CWJ Mobile

	Reduced	Weekends	Full
(Per minute or part thereof)	$	$	$
(There is no charge to mobile customers receiving these calls)	5.00	4.00	3.00

5.3. 2 *Calls To Digicel Mobile

Full	Reduced	Weekends
$	$	$
12.00	11.00	10.00

5.3.3 Calls to Centennial Mobile $7 anytime

*Rates are quoted in minutes but billed at applicable per second interval. Note that in Jamaica, the Calling Party pays method for billing of calls is used.

INTERNATIONAL TELEPHONE RATES

(GCT NOT INCLUDED)

Operator Assisted calls attract Additional surcharge as follows:

Per call surcharge	$20.00
Time & Charge	$20.00

	INTERNATIONAL DIRECT DIALLING (IDD) RATE Per Minute or Part Thereof			RATE VIA OPERATOR PERSON/ STATION	RATE VIA OPERATOR ADDITIONAL MINUTES
ZONES	**FULL**	**REDUCED**	**WEEKEND**	**3 MIN OR PART THEREOF**	**1 MIN OR PART THEREOF**
ZONE 1: USA	**26.00**	**24.00**	**20.00**	**78.00**	**26.00**
ZONE 2: CANADA	**26.00**	**24.00**	**20.00**	**78.00**	**26.00**
ZONE 3: UNITED KINGDOM	**26.00**	**24.00**	**20.00**	**78.00**	**26.00**
ZONE 4: WESTERN EUROPE	**37.00**	**34.00**	**30.00**	**111.00**	**37.00**
ZONE 5: COMMONWEALTH CARIBBEAN	19.00	18.00	17.00	57.00	19.00
ZONE 6: OTHER CARIBBEAN	**26.00**	**24.00**	**20.00**	**78.00**	**26.00**
ZONE 7: SOUTH & CENTRAL AMERICA	**41.00**	**38.00**	**34.00**	**123.00**	**41.00**
ZONE 8: REST OF THE WORLD	**50.00**	**45.00**	**40.00**	**150.00**	**50.00**

KEY TO TIME BANDS:

Full: Weekdays - from 6:00am to 5:59pm

Reduced: Weekdays - from 6:00pm to 5:59am

Weekend:	**-**	**from Saturday 12:01am to Mo**

Appendix D List of Interviewees

1. Caribbean Institute of Technology
2. University of Technology Innovation Center
3. University of Technology Faculty of Computer Science
4. University of West Indies
5. Ministry of Industry Commerce and Technology
6. Ministry of Education
7. Office of the Prime Minister
8. Cable & Wireless Jamaica
9. N5
10. Infochannel
11. Colis Internet
12. The New Economy Project
13. Centennial Ja
14. The HEART Trust
15. The Jamaica 2000 Foundation
16. The Jamaica Promotions Corporation (JAMPRO)
17. Montego Bay Community College
18. Holmwood Technical School
19. Glenmuir High School
20. Spauldings Primary School
21. Bethlehem/Moravian Teachers College
22. Clarendon College
23. Ewarton Primary School
24. Bog Walk High School