Caribbean Telecommunications Union

IDRC CRDI

Evidence for Caribbean ICT Policy Development

Caribbean ICT Policy Rapid Response Initiative
Research Summary

November 2011

Contents

The Caribbean Telecommunications Union is a regional intergovernmental organisation dedicated to facilitating the development of the Caribbean ICT sector.

This work was carried out with the aid of a grant from the Canadian International Development Agency and the International Development Research Centre, Ottawa, Canada

Message from the CTU Secretary General of the Caribbean Telecommunications Union

In 2009, the International Development Research Centre (IDRC) invited the Caribbean Telecommunications Union (CTU) to conduct policy research designed to provide evidence to support the formulation of sound policy for Caribbean ICT development. Funded by the IDRC, the Caribbean ICT Policy Rapid Response Initiative (RRI) was the first project of its kind for the CTU. It represented a new phase of widened activity and an increased thrust by the CTU to advance its mandate of helping the region foster ICT development.

The Caribbean faces many threats and challenges to its social and economic stability. Exposure to the effects of climate change, increasing criminal activity, contracting agricultural sectors and the effects of global economic crises are eroding the region's global competitiveness and threatening social and economic viability.

Fully cognisant of these threats, Caribbean Governments have committed to building competitive advantage on the basis of knowledge and information. They have acknowledged that the ability to create, share and use knowledge must become the driving force in shaping future development. Most have espoused the need to move their countries to knowledge societies and economies, but, in spite of the large expenditures on ICT in the post-liberalisation period of telecommunications markets, the region has not been able to make significant progress in advancing its ICT-based development agenda.

It has been agreed by many that a fundamental component in addressing this issue is the need for evidence-based policy development. This in turn requires the execution of relevant regional research. The Caribbean ICT Policy Rapid Response Initiative (RRI) is a cogent response. The CTU envisions that the RRI will form a part of a greater regional thrust towards evidence-based policy development in the Caribbean ICT sector. As such, it is our hope that the results of this Initiative, whether adopted in their entirety or in part, will serve to inform the process of policy development in the subject areas addressed.

The CTU recognises that this Initiative would not have been possible without the gracious support of our many partners and stakeholders. I would like to express my deep gratitude to the IDRC for the opportunity to conduct the project, by giving their substantial financial and other support. I would also like to extend our appreciation to the regional stakeholder community for their input and my sincere gratitude and appreciation to the members of the Review Committee, whose efforts were pivotal in ensuring that this Initiative was of the highest standard. Finally, I extend my heartfelt thanks to the Project Coordinator, Mr. Renique Murray, and to the members of the CTU staff, whose tireless efforts have brought this stage of the Initiative to a successful conclusion.

The current global climate necessitates a regional response that moves beyond discussion, one that takes us to meaningful action. The CTU therefore urges members to earnestly consider these findings and strongly advocates for action to be taken. We look forward to seeing the results used to formulate and implement sound polices that advance the region's ICT-based development agenda. The CTU stands ready to assist its members in implementing the recommendations of each project.

Bernadette Lewis
Secretary General
Caribbean Telecommunications Union

Executive Summary

The Rapid Response Initiative is a research effort that was spearheaded by The Caribbean Telecommunications Union (CTU) in conjunction with the International Development Research Centre (IDRC), and it forms part of the IDRC's wider Caribbean ICT Research Program. The Initiative was designed to provide quick, expert advice to regional policy makers, regulators and other groups in relation to specific areas of interest. In particular, the Initiative sought to target areas in which the absence, or lack of properly formulated policies, was at the time resulting in significant challenges to the implementation, adoption and/or operation of ICTs and ICT-related development.

The Initiative spawned a number of research projects directed toward the target areas, which were identified by polling the opinions of members of the CTU's regional stakeholder community. The projects were designed to be short and precise, and to unearth information that would be critical in informing the policy development processes of various regional bodies.

At the inception of this Initiative, the CTU's intent was to develop a quantum of resources for the regional members that would assist in their policy development processes. It was therefore considered that critical to this undertaking would be the solicitation of input from members in its development, the apprising of the members at regular intervals as to its progress, and ultimately the availability of its findings and outcomes upon completion. In keeping with this, the CTU has developed this Research Summary publication as a means of disseminating the outcomes of this work. This publication presents a summary of the final project report for each of the research projects done under the Initiative. It outlines the major objectives of the projects, the methodologies used in their execution, the main findings and outcomes of each project, and recommendations as to how to begin the process of addressing some of the more critical issues arising from the work.

In soliciting the input from the stakeholder community, one of the areas deemed to be of significant interest was the issue of the relevance of the region's current regulatory frameworks, in light of the phenomenon of convergence. Most of the regional regulatory frameworks emerged in the era of the liberalisation of the telecommunications sector. However, aside from minor amendments made in most of the regional territories, the sectors have not kept pace with developments in technology, and currently, the regulatory and legal framework is lagging the convergence phenomenon. As such, a project was envisioned that sought to determine the nature of the changes necessary in order to adapt to the new technological environment, while fostering sustainable development. The findings of this work support the belief of growing sector inadequacy despite rapid technological advancements. The research has identified that a critical factor leading to the current reality is the lack of implementation of laws and orders under the current regimes and structures. Furthermore, it asserts the position that much of the action necessary to facilitate proper regulation of the evolving sectors and markets within the region is in fact already catered for under the current frameworks. This is discussed in Chapter 1.

Key Caribbean policy and regulatory stakeholders have for years pointed to a lack of reliable data as a major impediment to their operations. The region by and large still lacks the basic indicators that would facilitate the design and monitoring of policies related to the information society. It is this pressing need for accurate, comprehensive and current statistical data on ICT indicators that has formed the basis for one of the projects conducted under this Initiative. Chapter 2, entitled "Globally Comparable Caribbean ICT Survey Instruments and Baseline Status of National ICT Data Acquisition", presents the major outcomes of this project. It details an assessment of the current status of ICT indicator collection in the CARICOM countries, and examines the various efforts directed towards identifying a set of globally-comparable, regionally-relevant core ICT indicators for the Caribbean. This research has found, however, that the region is still lagging in this regard and that there is still much work to be done. It highlights the key efforts that are being made and advocates for greater regional collaboration in addressing the issue. It also presents a template for the development of a standard ICT survey instrument that can be adopted for use in the regional territories.

Within the region, there have been a number of ICT-related businesses that have developed successfully in recent times. This is indicative of a developing ICT services sub-sector. In keeping with

this, Chapter 3 presents the findings of one of the projects that sought to assess this regional development, with the intent of identifying key policies that were critical to fostering the growth of this sub-sector. Such identification could then be proliferated and implemented in other regional territories. Unfortunately, the research done for this project found that the majority of successful businesses in the region do not ascribe their success to any policies in the sector. The research identified that the key factors that have led to the current state of affairs include a general lack of understanding of the sub-sector, as well as poor implementation of stated objectives by many governing bodies. This points to a need for a more structured approach to the development of the services sub-sectors across the region.

Chapter 4 presents a project with the distinct focus on the issue of regional crime and security, and the role of ICT in a collaborative effort to improve regional security. ICT has been, and is increasingly being considered, a significant tool to be used in the regional response to increasing cross-border and international criminal activities. This project sought to examine the types of policies that need to be developed and implemented regionally to facilitate strategies and approaches to addressing these problems. The work done under this project indicates that any such policies must consider the fact that there already exist a number of regional institutions that can serve as a skeletal structure for such regional strategies. It also asserts that a key issue in addressing crime is knowledge management, and thus policies geared towards such approaches would be significantly beneficial if a knowledge management systems approach is taken.

The last of the projects, presented in Chapter 5, addresses the issue of evaluating the impact of ICTs on regional development. A recent trend has been observed where regional governments have been investing significant resources into ICT initiatives, with the general intent of facilitating economic and social development. However, it is believed that little of this investment has been assessed to determine its success in achieving the stated objectives. The findings of this research verify this belief, confirming that at most only 50% of the projects implemented regionally are assessed or evaluated to some minimal extent. The work further asserts that none of the evaluative methods that are currently in use have been developed for the regional context. In keeping with this, an evaluative approach for the Caribbean context is presented and discussed.

The final section of this publication, chapter 6, presents a macro overview of the findings of the projects presented. It examines these findings to identify underlying issues and considers some critical factors that must be addressed in any approach that seeks the sustainable development of the regional ICT sectors.

A key emphasis in the execution of this project was to ensure that the results and findings are both relevant and readily applicable. As such, for the projects presented, an implementation plan is proposed wherever possible. These plans serve the primary purpose of advocating for the need for actual treatment of the issues presented here, while also seeking to capture the more critical issues that must be considered in seeking to implement potential strategies. However, they are not exhaustive and are by no means prescriptive, bearing in mind an appreciation of the uniqueness of the Caribbean construct. It is the sincerest hope that the findings of this work find relevance in the reader's context, and that they promote further consideration and ultimately action, on some of the more critical issues facing ICT development in the countries of the region.

What is the Rapid Response Initiative?

Overview

The countries of the Caribbean are presently faced with the challenge of responding effectively to the emergence of the knowledge era. In years past, much of the region invested heavily in the implementation of voice telephony systems and sought to make universal access possible. With the passage of time, this was made a reality, but the recent rapid development and advances in Information and Communication Technologies (ICTs) quickly began to outstrip previously conceived objectives and traditional regulatory frameworks. At the same time, globalisation and more recently the contagion of the global financial crisis have eroded the viability and sustainability of the region's economies, and are impelling the countries of the region to the consideration of movement towards becoming knowledge societies. At this point, the region is at a significant juncture where decisive action is critical and unavoidable if its countries are to be positioned appropriately in the evolving global environment.

The capacity of the region to respond to these changes hinges upon the existence of an enabling regulatory and policy environment within the countries of the Caribbean. Unfortunately, the policy frameworks of most countries have not kept pace with the development of ICTs. Consequently, this lag is presently posing challenges to the implementation of ICTs and the related development in many countries of the region.

In light of this, the Caribbean Telecommunications Union (CTU), in conjunction with the International Development Research Centre (IDRC), spearheaded a regional Rapid Response Initiative. The Initiative forms part of the wider Caribbean ICT Research Program that is being conducted by the IDRC. This Initiative was designed to provide quick, expert advice to regional policy makers, regulators and other groups in relation to specific areas of interest. In particular, the Initiative sought to target areas in which the absence, or lack of properly formulated policies, currently result in significant challenges to the implementation, adoption and/or operation of ICTs and ICT-related development.

Structure and Progression Path of the RRI

The mandate of the Rapid Response Initiative came under the charge of the CTU in the latter half of 2009; however, the Initiative effectively commenced in April 2010 with the engaging of the services of a Research Coordinator. The Research Coordinator's primary responsibility involved developing various aspects of the project, coordinating their implementation, and managing the project's progression towards completion. In addition to the Research Coordinator, A Review Committee was set up as a body to oversee the progression of the work done under the Initiative so as to ensure that it was of the highest standard. The Review Committee consisted of key ICT personnel from across the Caribbean region, the Research Coordinator, and members of the CTU Secretariat. The Committee was officially convened and commissioned in September 2010.

The RRI was conducted in four main phases. The soliciting of information from the regional community was the focus of the first phase of the Initiative. This commenced in April 2010 and was conducted in two steps: the issuing of a Call for Expressions of Interest, and the execution of a number of telephone interviews. The Call for Expressions of Interest was forwarded to CTU member representatives, operators and regulators across the region. The subsequent feedback was recorded by the CTU. This was followed by a series of telephone interviews conducted by the Research Coordinator of the Initiative. These two steps were foundational in identifying some of the more critical areas that are currently challenging regional ICT development.

The second phase of the Initiative began in September 2010. This phase sought to refine the rudimentary data received from the first phase into more defined research project areas. The primary tool utilised in the execution of this was the issuing of a Prioritisation Questionnaire. This questionnaire, which was forwarded to CTU member representatives, regulators and other stakeholders, sought to have the regional community identify the priority levels of the areas of challenge previously identified.

The third phase of the RRI involved the initiation, execution and completion of five research projects based on the input received in the first two phases. This phase began in November 2010,

with the acquisition of five Project Researchers to conduct research on each of the projects. The projects were conducted over a period of six months.

The fourth and final phase of the Initiative comprised of two components. The first component involved the Review Committee's review and assessment of the work done by the project researchers. This was an iterative process, as the researchers worked towards the standards set by the Committee. The second component of this phase concerned the dissemination of the Initiative's findings and outcomes to the CTU's regional stakeholder community. As stated previously, this publication forms a critical part of this thrust. However, in addition to this publication, the CTU has planned a number of activities as part of its dissemination efforts, and it is the intention of the CTU to continue these activities over the coming months.

Identification of Research Areas and Determination of Projects

Upon inception, it was determined that a critical indicator of the Initiative's success will be for its findings to be relevant and readily applicable to the real challenges facing the region. To this end, the CTU sought the input of ICT regulators, operators, policy makers, stakeholders and other interested parties across the region in the identification of these critical areas.

The soliciting of information from the regional community was the focus of the first phase of the Initiative. This was conducted in two steps: the issuing of a Call for Expressions of Interest and the execution of a number of telephone interviews. The Call for Expressions of Interest was forwarded to CTU member representatives, operators and regulators across the region. This was followed by a series of telephone interviews conducted by the Research Coordinator of the Initiative. These two steps laid the foundation for identifying some of the more critical areas that are currently challenging regional ICT development. The completion of these steps marked the end of the Initiative's first phase, and the six main areas of challenge identified at this point were as follows:

- Topic 1: The development of a Caribbean regulatory model/framework
- Topic 2: ICT data collection
- Topic 3: Public awareness and education
- Topic 4: Policies that promote success in ICT-enabled businesses
- Topic 5: Further functional regional integration and collaboration
- Topic 6: Deepening of the liberalisation process

It should be noted that the responses to questionnaires and interviews conducted in Phase One revealed that cybercrime is an area of critical concern in a number of territories. However, to prevent repetition of similar work being conducted by other regional entities, it was decided that the issue of cybercrime should not be addressed under this Initiative.

The second phase of the Initiative sought to refine the data and information received from the questionnaires conducted in the first phase, into defined research project areas. The primary tool utilised in executing this was the issuing of the Prioritisation Questionnaire. This questionnaire, which was forwarded to various Caribbean stakeholders, sought to have the regional community prioritise the areas of challenge previously identified. The results of this questionnaire were as follows:

- Level 1 (Highest priority) – Area 2: ICT data collection
- Level 2 – Area 1: The development of a Caribbean regulatory model/framework
- Level 2 – Area 6: Deepening of the liberalisation process
- Level 3 – Area 3: Public awareness and education
- Level 3 – Area 4: Policies that promote success in ICT-enabled businesses
- Level 4 (Lowest level) – Area 5: Further functional regional integration and collaboration

This served as a platform for the development of five key research projects. The first of these sought to target the issue of the relevance of the region's current regulatory frameworks. It is well known that the liberalisation of the telecommunications sector in the Caribbean region began in the 1990s. As such, most of the governing regulatory frameworks across the region were amended or developed during this time. Since then, there have been rapid developments in the sector, a critical aspect of which has been the convergence of technologies. Unfortunately, most of the regulatory regimes in the region have not kept pace with these developments, and are now rather inadequate. As such, this project sought to examine the changes that must be made in order to have a regulatory regime, which can support the further advancement of ICT in the countries of the region. The project

was given the title: Implications of Technology and Service Convergence on the Operational and Organisational Aspects of Regulation.

Key Caribbean policy and regulatory stakeholders have for years pointed to a lack of reliable statistical data on ICT, as a major impediment to the further development of regional policy, regulation and service provision. The region by and large still lacks the basic indicators that would facilitate the design and monitoring of policies related to the information society. It is well known that jurisdictions which have ready, reliable data are better able to assess the impact of ICT's on their economies, benchmark their progress against other countries and calculate the level of investment required to provide households and businesses with access to different types of ICTs. In light of this pressing need, a project was envisioned that sought to assess and document the status of ICT indicators collection in CARICOM countries. The project also sought to advocate for the benefits of adopting standard Caribbean survey instruments to acquire national ICT indicators that are regionally relevant and on par with global standards. This project was given the title: Globally Comparable Caribbean ICT Survey Instruments and Baseline Status of National ICT Data Acquisition.

The past few years have witnessed the growth and increasing complexity of the sector. Within the region, there have recently been a number of businesses that have developed successfully in the ICT-services sector. However, the pace of development has been uneven across the different countries. In order to facilitate the further regional development of these business ventures, a research project was directed towards the examination of the types of policies that are necessary to facilitate this development. The project was entitled: Analysis of the Policies Designed to Encourage Development of Businesses in the ICT-Services Sector.

Additionally, within recent times, crime and security have become very critical regional issues. Furthermore, many of the issues require a regional response in order for them to be effectively addressed. ICT has been, and is increasingly being considered, a significant tool to be used in the treatment of some of these matters. As such, a project was envisioned with the objective of examining the type of policies that need to be developed to facilitate the further implementation of ICT in collaborative cross-border strategies for the regional territories. The project title was: Collaboration Policy for Functional Cooperation through ICT, in the Area of Crime and Security.

Another recent trend observed was that regional governments have been investing significant amounts of resources in developing and implementing ICT initiatives, with the aim of achieving greater operational effectiveness. These investments are still increasing, and are expected to continue. Accordingly, it is important to be able to assess and to implement assessment structures, in order to validate and evaluate the nature of the impact of ICT. As such, though not identified as a key concern in the initial analysis, it was subsequently identified as a critical underlying component to the regional sector's advance. Consequently, a research project was developed to examine methods for applying this within the regional context. This project was entitled: The Examination of Prevailing Models for the Evaluation of the Impact of ICT on Development within the Caribbean.

Purpose and Structure of Publication

As highlighted earlier, there were five research projects conducted under this Initiative. Each project was effected as a standalone entity, with a dedicated Project Researcher executing the main investigation into the subject. As expected, there were differing findings and outcomes, as well as supporting reports and other documents associated with each of the projects under the Initiative. However, in keeping with the CTU's intention to make the outcomes of the work done under this Initiative readily available to its regional stakeholder community, it was necessary to find a way to effectively communicate the various elements. The publication offers a summarised presentation of the main reports submitted by the project researchers upon the completion of work on their respective projects. Thus Chapters One through Five seek to communicate the major objectives, the methodologies used, the main findings, outcomes and recommendations emerging out of the work done for each of the five projects. The complete report on the findings of each research project will be made available via the CTU's website.

Chapter 1: Implications of Technology and Service Convergence on the Operational and Organisational Aspects of Regulation: Review of Regional Regulator Readiness for Convergence

1.0 Overview of Analytical Framework

This paper seeks to firstly evaluate current systems of regulatory oversight throughout the Caribbean, and secondly to consider the continued viability of these systems with the onset of the convergence in services and networks in the individual markets across the region.

From the perspective of the market structure, this document proposes to analyse the telecommunications and broadcasting sub-markets from the perspective of the layered model of the Electronic Communications sector, as represented below.

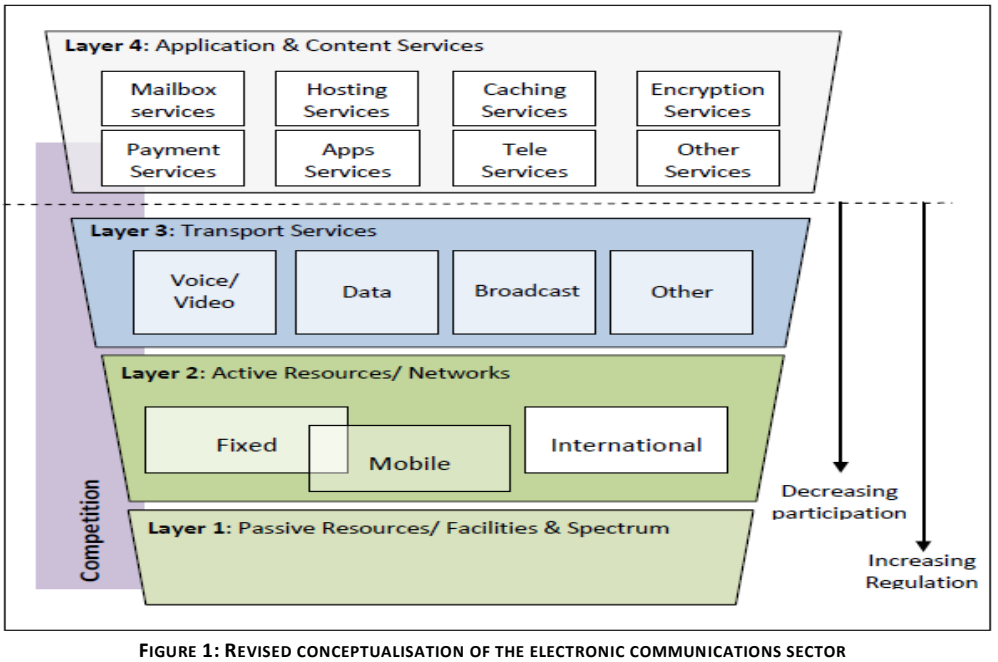


FIGURE 1: REVISED CONCEPTUALISATION OF THE ELECTRONIC COMMUNICATIONS SECTOR

This approach addresses the identification of horizontal equivalents across platforms. Much of the regulatory structures created to regulate the voice-centric PSTN remain valid, albeit with necessary adjustments for applicability to new services and to reflect revised regulatory philosophies.

In the context of the first objective, i.e. to evaluate current systems of regulatory oversight throughout the Caribbean, the research for this paper required the review of the legislative framework and regulatory practices that exist today. This was considered by a review of the law as written in the various jurisdictions in conjunction with the appreciation of how these systems are actually implemented. In this way, subtle variations of regulatory approach were sometimes identified. These variations, on discussion, can sometimes be traced to the paths to liberalisation that

the various countries of the region have taken over the last twelve (12) years. The areas of concern in this part include:

(i) A review of the services under regulatory oversight,
(ii) A review of authorisation approaches used across this variety of services,
(iii) An overview of the scope of applicability of regulatory frameworks such as Universal Service, Price Regulation and even Interconnection; and
(iv)A review of the roles and functions associated with the regulation of broadcast services across the region.

The detailed outcome of this assessment is elaborated upon in Section 2 of this paper.

In the context of the second objective, i.e. to consider the continued viability of these systems with the onset of convergence in services and networks, the research for this paper required the evaluation of existing mechanisms to tacitly, directly or indirectly facilitate the regulation of a variety of areas of interest. This assessment provides a snapshot of the readiness of regional regulatory frameworks/laws to provide the necessary oversight to meet the dual impetus of encouraging investment into the domestic arenas, and enabling the orderly development of markets. Among the areas of concern that were evaluated are:

(i) Ease of application of authorisation across service categories;
(ii) Managing competition, anti-competitive behaviour and net neutrality
(iii) Flexibility in telecommunications resource (spectrum and numbering) administration
(iv) Addressing schema, and the management of address scheme migration
(v) Treatment with issues relating to local content, intellectual property and broadcast rights management

1.1 Key to the analytical tables included in this Paper

The detailed outcome of this assessment is discussed in Sections 3 and 4 of this paper. Each section is followed by a tabular representation of its findings.

Due to particular variations in the approaches of regulatory oversight identified across the region, the framework has elaborated upon the need to facilitate the proper representation of this variation in approaches applied to the administration of particular market segments within the traditional telecommunications and broadcasting sub-sectors.

For example, (i) In considering "**Voice Services**" and "**Competition Regulation**", there is further segmentation to represent "fixed line services" (f), and "mobile services" (m). Further market segmentations include "international services" (int'l), and "subscription broadcasting services" (STV).

(ii) There is particular consideration of **Spectrum Management** as opposed to **confirmation of network installation/ zoning administration** related to facilities deployment and network rollout. This also identifies **Flexible Spectrum Management** as a particular approach, distinct from the general oversight of licensing of spectrum bands.

(iii) Under the scope of regulatory oversight of the regulator, it was found that there was some variation in the administration of **Retail Price Regulation**, **Consumer Protection, Access to Facilities** and **Universal Service.** This warranted particular identification in the report, which is expanded upon at the end of Section 3.

It should be noted that due to the limited activity in the areas identified for new development, this level of market sub-segmentation was not utilised in consideration of these areas. The progress made in these new areas is identified at the end of Section 4.

In all tables, the following interpretations of the coloured cells apply:

1. Green – represents full coverage of the relevant issue in both statute and practice of the regulatory body's operations
2. Yellow – reflects either:
   a. Full coverage of the relevant issue in statute, but no coverage in the practice of the regulatory body's operations; or
   b. Partial coverage of the relevant issue in statute, with appropriate coverage in the practice of the regulatory body's operations.
3. White – represents no coverage for the relevant issue in statute, but there is reasonable potential for such coverage based on the remit of the regulatory body.

4. Hash – represents that the coverage of the relevant issue is not under the general remit of the regulatory body.

2.0 Review of Regulatory readiness across the Region

2.1 Regulating Market entry and operations

The primary point of consideration was the identification of the regulatory authority for each jurisdiction. Of the jurisdictions reviewed, the regulator may be the function of either a department of government (15.4%), or the responsibility of some statutory body (or bodies) (84.6%). Within this latter category, there were further divergences in the administrative framework in which these functions were delegated.

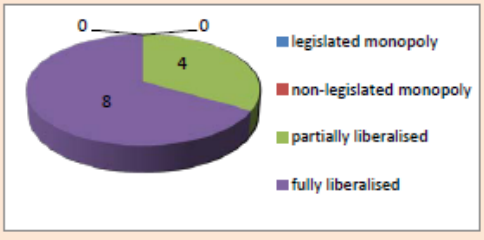
The primary role of the sector regulator is to determine the appropriate bounds of the markets it administers, and establish a framework for recognising the persons that operate in that sphere. In this way, other functions of the regulator can be effected through the application of regulatory or licence obligations on the identified persons.

It is interesting to note the breadth with which the sector is regulated in some jurisdictions. The breadth of such oversight must be reviewed in terms of the relevance to the scope of an economic sector regulator. For example, in OECS member states and Barbados, for example, private telecommunications networks and closed user groups (e.g. Corporate LANs and WANs) are required to register with the regulatory authority, while this is not a requirement in the Bahamas or Trinidad and Tobago. Similarly, in Antigua and Barbuda, Barbados and other jurisdictions, there is the continued requirement for retailers in telecommunications equipment to be licensed. The relevance of such regulation to the general development of the competitive public telecommunications sector must be considered with a view to evaluating whether there is an identifiable benefit for the continuance of this regulatory requirement for private telecommunications networks.

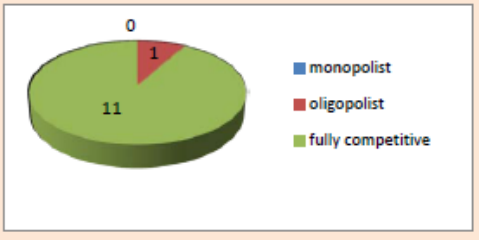
2.1.1 Telecommunications sub-sector

On review of the CARICOM member states, there is a growing recognition that the oversight of the telecommunications regulator has oversight over telephony services (fixed and mobile), as well as data services such as Internet service provision. Exceptions to this are still found in Antigua and Barbuda and Guyana, where Internet services are still regarded as value-added services; and other jurisdictions such as Barbados, where by virtue of the class licence regime, Internet service providers are exempted from some obligations of other telecommunications providers. There is also the general recognition of the need to manage telecommunications resources such as radio frequency spectrum and telephone numbers, despite the fact that the administration of the former was not always necessarily the responsibility of the same body as that responsible for other aspects of regulation.

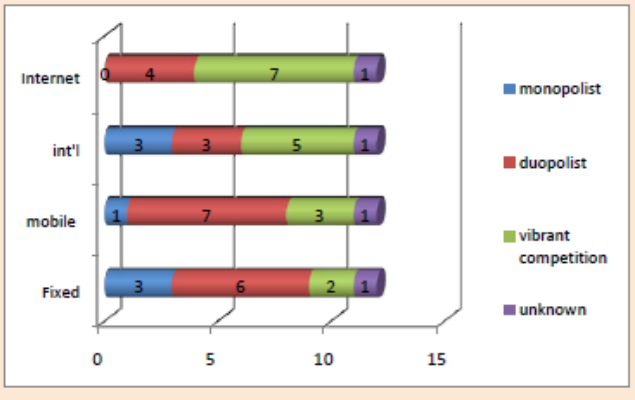
Fact Box 1: Overview of telecommunications sector administration



Regional Voice Telecoms Sector Profile



Regional Internet Sector Profile



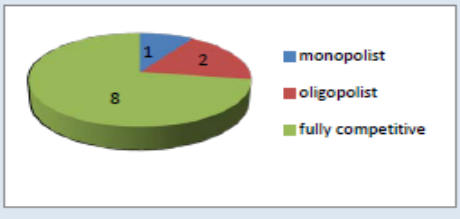
Competitive market profiles across the region

Of note as a commonality between the regulatory frameworks across the region was the requirement for parties to be specifically licensed (either individually or through a class licence regime) for each distinct service offered, even in the instance where the party is an existing operator in another service segment. While there may be differing approaches to the level of technological specificity associated with the licensing of services, there are no member states which allow the initiation of operation following a simple registration, much less notification process. As such, the regulatory cost (and delay) of gaining authorisation has acted as a significant barrier to the deployment of converged networks and services – in some instances forming the single barrier to the entrance of competitive service providers in particular sub-sectors. Particular examples in this regard can be seen in Barbados and the Bahamas, where regulatory barriers are the primary hindrance to the commercial deployment of competitive "triple play" services by fixed telecommunications/ subscription broadcast operators.

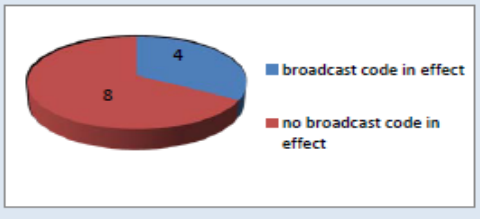
On authorisation, the regulatory authorities have varying powers with regard to the oversight of the going concern of telecommunications operators. While most regulators boasted of powers to ensure information gathering and quality of service from operators; of the thirteen jurisdictions reviewed, only four recorded some level of active competition regulation across **all** segments of telecommunications service providers authorized to operate within the jurisdiction. While their parent Acts provided for such authority and powers to implement frameworks such as access to facilities, (wholesale and retail) price regulation and regulatory cost separations, only four jurisdictions identified these as ongoing activities in their administration of the telecommunications sub-sector. Similarly, direct oversight of the frameworks necessary to diagnose anti-competitive behaviour also seemed absent. There is recognition, however, of the sharing of responsibilities with regard to the instance of the OECS states between the NTRCs and ECTEL.

Also significantly noteworthy is the hand-off approach taken to managing international telecommunications providers, not only with regard to frameworks such as interconnection, but also in the instance of on-going monitoring and reporting requirements of the going concern. The regulatory impetus seemed to be limited to encouraging the landing of submarine fibre, and less about encouraging the provision of innovative off-island connectivity solutions to both operator and non-operator publics. Without appropriate focus and oversight in this space, services such as "Carrier-Selection" or "Carrier Pre-Selection" will not get much traction – leaving the outgoing international service market largely uncompetitive.

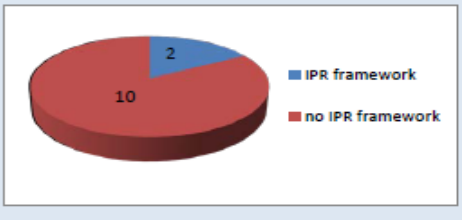
Fact Box 2: Overview of broadcasting sector administration



Regional Broadcasting Sector Profile



Regional broadcast content oversight



Regional CATV obligations for IPR

2.1.2 Broadcasting sub-sector

Unlike what was seen in the telecommunications sub-sector, the broadcasting sub-sector seems widely unmanaged across the region. Of the thirteen countries under review, only five (5) – namely, the Bahamas, Barbados, Belize, Jamaica and Trinidad and Tobago – had frameworks established to address broadcasting other than with regard to the issuance of network-related (i.e. radio) frequency, antenna site zoning, or network rollout/rights of way) licences. Of these, only four (4) of the jurisdictions' frameworks for authorisation of service depended on the issuance of licences, which include content regulation conditions as well as technical requirements for the delivery of service.

2.2 Consumer protection across markets

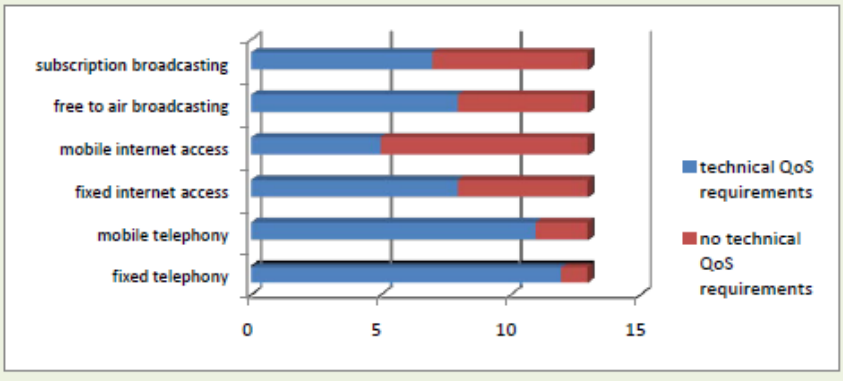
2.2.1 Telecommunications subsector

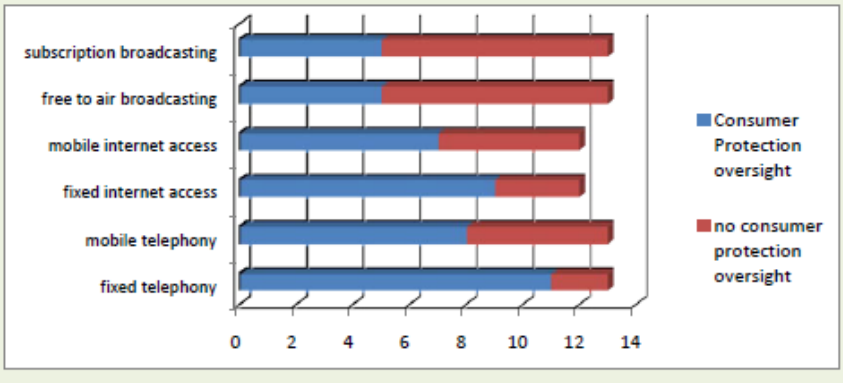
The regulator has a role in ensuring that operators adhere to some basic levels of customer relations with regard to how they treat with service users. Normally, these may take the form of quality of service requirements of the network or service elements of the business to ensure that (a) the service is itself of a minimum quality and (b) that the adjunct support services operate in a timely manner to reduce service brown-outs and black-outs.

It is noteworthy that quality of service benchmarks are identified across the region as key regulatory frameworks for all aspects of regulated telecommunications services. While this is commendable as it suggests the intent to monitor the operations of providers when they are going concerns, research interviews indicate that there is little to suggest that clear benchmarks have been established for non-traditional telephony services. Furthermore, there seems to be little indication that in-country operations are sufficiently robust to ensure appropriate independent measurement of some of the key performance indicators identified.

The consumer protection function should also include the establishment of an arbitration body to which complaints that are not concluded to the satisfaction of the consumer can be escalated. Many of the regulatory frameworks facilitate this, but with limited evidence of implementation of this aspect of consumer protection.

Fact Box 3: Overview of use of Service Quality and Consumer complaints management frameworks





A further challenge exists: there is not as much of a robust requirement for affirmative action to resolve customer complaints for segments other than voice telephony throughout the regulatory frameworks of the region.

2.2.2 Broadcasting sub-sector

There is little evidence of robust regulatory frameworks regarding consumer protection within the broadcasting sub-sector, particularly considering the nature of subscription broadcasting services such as CATV or Satellite TV. With the exception of the recent position paper issued by the Jamaican Broadcast Commission, and the general guidelines as provided in the licensing conditions of URCA and TATT, this is a sphere for which there is a paucity of consideration across the region.

2.3 Competition Management

Competition regulation is critical to ensure that there is no collusion or other anti-competitive practices in the cost, terms or conditions associated with either direct provision of service to consumers, or in ancillary or downstream arrangements that may impact the provision of service to consumers. In markets as small and vulnerable as those of member states across the region, vigilance of such behaviour is essential to mitigate price gouging of the consumer, and the failure of competition-encouraging systems within the jurisdiction. Competition powers include the power to declare a particular operator dominant, execute orders of cessation against particular practices, and

where necessary, powers to effect the separation of a going concern due to anti-trust characteristics of its operations.

As with spectrum, competition management and regulation is a major responsibility to ensure structured development of the sector. Barbados and Jamaica are two instances where independent Fair Trade Commissions have been delegated the responsibilities of competition authority of the telecommunications sector. In other jurisdictions, the competition power is shared with that of the sector regulator, as in URCA in Bahamas.

Competition management seems to be an issue for members of the OECS. While many cite the relationship with ECTEL in providing technical support in this regard, a review of their parent legislation suggests that limited oversight of competition issues is under the regulatory jurisdiction of either the NTRCs or the regional ECTEL, other than some authority to declare a service as regulated or unregulated due to the existence of competition in the market segment. This is similar to the framework in Trinidad and Tobago, although the price regulatory powers are more definitively prescribed in statute, providing TATT more flexibility than the NTRCs/ ECTEL.

While there is a case to strengthen such powers, or encourage the implementation of these as primary concerns, there seems to be a larger issue, which is that there is no general competition or fair trade regulatory framework enacted in these jurisdictions. Such a framework would facilitate the implementation of robust regulation of anti-competitive behaviour in the telecommunications and broadcasting markets (among others) and provide for such oversight by appropriate authorities. It should be noted that this is a considerable regulatory gap, as the CARICOM Fair Trade Commission is geared by the governing treaty to act primarily as an appellate body pursuant to the preliminary decisions of the member state's competition authority. Where the member state has no defined competition authority, the framework would be less than effective.

2.4 Content management

2.4.1 Telecommunications subsector

The applicability of content management in the telecommunications sector is restricted to the management of content accessed or uploaded to the Internet. At this time, there are no jurisdictions with a practice of reviewing the types of content accessed or web sites visited on the Internet. In this way, there is a gap of understanding of usage characteristics of Internet users (except whether subscriptions or use of service is reported by the ISPs). This gap of understanding can have a profound effect in developing meaningful, regionally relevant action plans to deal with questions of Internet-based cyber-piracy (be it intellectual property or identity), and related issues as broadcast rights management, and the impact of one on the other.

2.4.2 Broadcasting sub-sector

Like the telecommunications sector, content management in the broadcasting sector seems widely unmanaged across the region. Of the thirteen countries under review, only four (4) – Bahamas, Belize, Jamaica and Trinidad and Tobago – had established frameworks relating to broadcasting other than with regard to the issuance of network-related licences. The regulation of content is generally treated liberally in the region; as, outside of the five states identified above, this is not under the purview of the regulatory authorities, save and except to be addressed in a reactionary manner due to public concern. Where there are frameworks that speak to the management of content, this is largely achieved through the implementation, and ensuring compliance to a co-regulatory framework in the form of a "Broadcast Code."

Of the institutions engaged, Jamaica is notably the most proactive body in the issuance of regular Orders, which seek to actively and authoritatively adjust the frame of the broadcast content rules. Also unique to Jamaica and Trinidad and Tobago in the region, is the indication of clear positions with regard to adherence to intellectual property rights of broadcast programmes as it relates to the transmission of extra-jurisdictional content by subscription television providers. Such a position is unique to these two jurisdictions in the region.

An overview of the findings of the review, with regard to the implementation of key regulatory frameworks to guide the regulation of the telecommunications and broadcasting sectors is found in Table 1 as follows.

TABLE 1: PROFILE OF IMPLEMENTATION OF KEY REGULATORY FRAMEWORKS FOR TELECOMS AND BROADCASTING SECTORS, BY COUNTRY

	CARICOM Member Country	Regulatory agency	Regulatory Oversight Framework								Domestic converged network deployed	Regulated domestic PSTN inter-connect	Competition Regulation		
			Voices services		Internet		Broadcast			Spectrum manage/t					
			f	m	access	content	FTA (facilities)	STV (networks)	content				f	m	STV
1	Antigua & Barbuda	Ministry													
2	Bahamas	URCA													
3	Barbados	Ministry			(a)										
		FTC													
		BBA													
4	Belize	PUC													
		BA													
5	Dominica	NTRC											(b)	(b)	
6	Grenada	NTRC											(b)	(b)	
7	St. Lucia	NTRC											(b)	(b)	
8	St. Vincent & the Grenadines	NTRC											(b)	(b)	
9	St. Kitts & Nevis	NTRC											(b)	(b)	
10	Guyana	PUC													
		NFMU													
		Ministry			(a)				FTA -TV						
11	Jamaica	OUR											(b)	(b)	
		SMA													
		FTC													
		BC													
12	Suriname	TAS													
13	Trinidad & Tobago	TATT											(b)	(b)	
	Cayman Islands														

Overview of headers, Table 1

Regulatory Oversight Framework*: refers to the regulatory activities undertaken by Authorities related to parties providing the services identified – voice (fixed & mobile), Internet access, Broadcasting (free to air & subscription). Regulatory activities under consideration include regulatory oversight of (i) authorisation/ licensing, (ii) network rollout and maintenance, and (iii) wholesale and retail quality of service.*

Content Regulation includes considerations as light touch as reporting requirements related to gross consumer usage, to more intrusive approaches as obligations to block, filter, censor or otherwise restrict end user access to content by any means, or to any particular time.

Spectrum Management refers to the issuing of authorisation to use radio frequency spectrum, and may include technical or other qualifications of use. Such authorisation may be based on the individual power of the identified agency, or pursuant to recommendation to the relevant Minister.

Domestic converged network deployed*: reflects whether the authorities have identified a commercial service provider which delivers any combination of telephony, data and subscription broadcast services.*

Regulated domestic PSTN interconnect: *refers to the regulatory authority to ensure oversight of interconnection negotiations, as well as necessary review of interconnection terms and conditions subject to any such agreements.*

Competition Regulation*: refers to the regulatory authority to undertake necessary investigations and prescribe necessary Orders to treat with issues of anti-competitive behaviour. Regulatory powers include: (i) determination of markets, (ii) determination of dominance/co-dominance (iii) administrative orders to cease and desist anti-competitive practices either (a) towards consumers, (b) in conjunction with suppliers, or (c) against similarly situated authorised competitors.*

3.0 Existing instances of Regulatory Arbitrage

3.1 What is meant by Regulatory Arbitrage?

In reviewing the existing instances of regulatory arbitrage, the broadcast and telecommunications segments are considered individually. In the following chapter, where the instances of arbitrage that can impact convergence are considered, the variances in regulatory approach across sub-sectors will be fully evaluated.

In economics, regulatory arbitrage generally refers to specific instances where a firm takes advantage of differences in its actual and regulated positions to achieve competitive gains. Persistent regulatory arbitrage, due to insensitive regulatory regimes, may result in increased risk in the firm's operations.

From the perspective of the regulatory authority, regulatory arbitrage refers to instances of imbalance in regulatory rights and obligations, which can compromise the ability of the framework, in part or in total, to achieve the intended policy aims.

Instances of regulatory arbitrage may develop due to changes in market conditions, which lead to product substitutability within and across traditional market bounds. Arbitrage can also develop as a result of frameworks that are characterised by many instances of obligatory exemptions or extra-market, government interventions. Regulatory arbitrage can threaten the stability of the market, and may ultimately result in market failure. Accordingly, avoiding regulatory arbitrage is about striking the right balance between direct and indirect regulatory oversight, as well as requiring constant vigilance in market conditions to determine the appropriate form and type of action that may be warranted. In this context, the regulatory concept of "forbearance" can be an advantageous tool to regulators in areas of market fluctuation.

In reviewing the electronic communications regulatory frameworks across the region, there has been consideration of instances where the rights and obligations of certain participants or groups of

participants are imbalanced with that of other persons similarly situated within the general rubric of the revised, layered market profile.

3.2 Instances of regulatory arbitrage within existing markets

The regulatory frameworks of the sector have been dominated by the liberalisation thrust in the region for the first half of the last decade, due to the aggressive incursion of a competitive mobile service provider across the region. This discourse was however constrained in many instances by the nature of licences of authorisation issued before the completion of the regulatory framework, thereby framing a limited role for regulatory oversight in particular market segments. This is of particular relevance to the region, given that the state of competition in the mobile segment is limited to two operator oligopolies in most jurisdictions. In this instance, the imbalance in the application of regulatory oversight over the mobile telecommunications segment is a significant gap in regulatory oversight.

Another general comment of note is that the regulatory frameworks are still directed towards managing the liberalisation process, and not ideally suited to the managing of the sector as a matter of going concern.

Despite these general findings, it should be recalled that not all CARICOM member states have undertaken the liberalisation process, resulting in instances of entrenched monopolistic incumbents. Examples include Antigua and Barbuda and Guyana, whose regulatory frameworks are woefully unsophisticated with little of the common tropes seen in other frameworks throughout the region. Accordingly, the regulatory oversight to ensure consumer protection is limited to protections associated with incumbent, legacy PSTN networks and systems, and not recognising the body or regulatory practice that has developed to ensure proper service provision by mobile service providers, and Internet Service Providers.

The issues of arbitrage identified are reviewed in a general context reflecting either the capacity or the practice of the Regulator to act in these areas. There is particular focus on particular jurisdictions as appropriate to highlight unique instances of framework construction.

3.2.1 Regulatory approaches for Fixed vs Mobile Networks and Services

A major instance of imbalance in regulatory obligations is seen between fixed and mobile operators in most jurisdictions under review. These imbalances are largely due to the issuance of licence of authorisations before the completion of the regulatory regime (as occurred in Jamaica, Barbados and OECS in particular). Examples of instances where the imbalances are readily demonstrated include:

- The requisite power of the regulatory authority to undertake (wholesale and retail) **price regulation** of a variety of services or “service baskets”;
- Associated with the implementation of a price regulatory regime, the necessary obligation of mobile providers to implement necessary **regulatory cost separations** of their operations; and
- Regulatory oversight of **consumer protection** systems and frameworks including consumer complaint arbitration bodies.

The common rationale for these imbalances are usually associated with the argument that these obligations should be applied only to parties with significant market power (SMP) – and thus explicitly focused on the incumbent fixed line operator only. While model frameworks do encourage that these obligations focus at least on SMP operators, the rationale that vibrant competition would constrain the non-SMP operators from undertaking predatory practices fails to have relevance in the oligopolistic markets that have developed across the region. Such markets are not and should no longer be described as competitive in nature. As such, there is still a major requirement for the oversight of the regulators to minimise the counterproductive impacts of hyper-competition across the region.

The need for re-evaluation of this imbalance is further heightened by the fact that mobile penetration rates far exceed those of fixed line services across the region – thus overturning the presumption that the fixed operator is the party with SMP.

Examples of jurisdictions with the imbalance include:

(i) Barbados; where the Fair Trade Commission's oversight of wholesale price regulation and consumer protection issues is limited by Regulation to the incumbent fixed operator Cable and Wireless.

(ii) OECS; National Telecommunications Regulatory Commissions (NTRCs) are similarly constrained, focusing primarily on the fixed incumbent C&W, citing the "competitive" nature of the mobile market limiting regulatory oversight.

It should be noted that this imbalance could be resolved with the appropriate issuance of revised Regulations or Orders recognising the changes in the conditions of the domestic marketplace.

3.2.2 Interconnection and access to facilities

As discussed above, many of the administrative frameworks established in the relevant Acts and Regulations that govern the sector focus on the modalities and consideration of market liberalisation. This is nowhere more explicit than in the frameworks governing interconnection – or more precisely the process of establishing (and in some cases approving) interconnection agreements.

In accordance with minimum WTO requirements, jurisdictions have enshrined that the obligations of interconnection are limited to only the person identified as SMP in the jurisdiction. Furthermore, in most instances the frameworks limit the influence of the regulator on the terms and conditions of the agreement outside of the Reference Interconnect Offer (RIO) of the operator with SMP at the time of liberalisation. This has resulted in the regulator arbitrage where there have been asymmetric fixed-to-mobile interconnection rates, which have resulted in super-normal revenues to the new entrant from interconnection. This has also had the effect of creating a cost barrier that has minimised the impact of direct product competition between the major operators, thus resulting in a scenario where most jurisdictions boast mobile penetration rates that exceed 100% while the domestic markets display little evidence of either cost or quality being used as discriminating elements for competitive advantage and market growth. It has been argued by some that the regulatory arbitrage evident by (artificially) inflated mobile termination rates is destroying the competitiveness of the regional mobile telecommunications marketplace.

Furthermore, as the regulatory oversight of interconnection seems geared primarily to addressing the process of agreement making, and the wholesale inter-carrier rates associated therewith; in some instances authorities are deemed to be constrained from regulating the application of retail rates for interconnection services. This interpretation has proven to be critical to the development of the telecommunications sector. In the case of the OECS, where regulatory orders have caused the reduction of inter-carrier settlement prices, there is little evidence of this cost savings being passed to the consumer, as retail interconnection rates remain (artificially) inflated. This persistent price gouging suggests the existence of a non-competitive sub market that is not effectively regulated. The reason for the existence of this sub-market may be the conjoined effect of two distinct instances of regulatory arbitrage. As discussed herein, while there is limited power of the regulatory authority to address interconnection beyond adherence to the RIO; without the application of general **price regulatory powers**, and basic **competition powers (**to declare dominance and co-dominance), jurisdictions will remain near powerless to apply such approaches through the declaration of all interconnection services as inherently monopolistic and subject to price regulation.

It is essential that the regulatory imbalance be rectified so that the regulatory authority is appropriately empowered to instruct **any** interconnecting party to adhere to particular instructions on the management of the interconnection service as a going concern. Regulatory precedent identifies both wholesale and retail interconnection rates as monopolistic irrespective of carrier – incumbent or new entrant, fixed or mobile operator – and warranting the purview of regulatory authority.

Also of interest is that there are a number of jurisdictions, including Antigua and Barbuda and Guyana, where there is a noteworthy absence of oversight of inter-carrier **access to facilities/ infrastructure sharing** frameworks, which are necessary to expedite interconnection as well as provide for network unbundling and wholesale provision of services.

3.3 Instances of regulatory arbitrage across existing markets

3.3.1 Universal Service versus Zone Licences

A major difference in the historic administration of service provision of (fixed) telephony and broadcasting services is the framing of obligations to ensure access to the majority, if not all, persons within the service area of the licensed operator. The regulatory premise of requiring ubiquitous coverage has not changed, but has in fact been heightened; thus, the consideration of these differing frameworks is essential in understanding the impact of converged service provision in CARICOM markets.

In the liberalised telephony sphere, ubiquitous or universal coverage was facilitated through the establishment of Universal Service programmes that sought to reduce the capital and/or operating costs of extending the networks to non-economically viable areas. According to the general premise of Universal Service or its more market-centric version of Universal Access, some areas would be designated as uneconomic by the administrator of the programme, and that special funding would be provided to ensure rollout or sustained service to those areas. This in itself is in fact a managed form of regulatory arbitrage, which remains a continued area of development within the regional telecommunications sphere – with the inclusion of mobile services as a universal service provider, a form of regulatory convergence in this sphere of oversight.

In the data telecommunications sphere, traditionally this issue did not arise. The reason for this was two-fold. Firstly, in the context of traditional narrow-band technologies, no specific infrastructure was required to facilitate dial-up Internet/ data services. Secondly, the traditional terminal equipment – the computer – has until recently been more cost-prohibitive to the general public, reducing the demand for the service in rural or non-economic areas. Both of these socio-economic conditions are changing – broadband service provision requires an upgrade of plant to the location, and the unit cost of computing terminal equipment has fallen to within the price range of an ever greater proportion of consumers.

In the sphere of broadcasting, however, the regulatory approach has been significantly different from that pertained in the sphere of fixed telephony. Historically, the broadcasting service provider was obliged to provide service to all persons within its licensed geographical coverage. In the free to air (FTA) broadcasting segment, that meant the placement of broadcasting sites and the control of broadcast signal powers to effect the required coverage. In the sphere of terrestrial subscription broadcasters, the obligation required the operator to have the necessary capacity to expand its network to reach any consumer within the licensed area – without regulatory assistance.

In the reality of converged operators, whose networks may provide both telephony and broadcasting services, the situation must not arise where, between two competing firms using different technologies, one receives financial aid from the administration while the other must depend on its own resources. The objective of a rationalised regime must treat both parties equally. The solution is to either:

(i) Eliminate Universal Service Programmes as imbalanced;
(ii) Reduce the applicability of Universal Service programme regimes to particular, very specific situations (e.g. the development of wholesale infrastructure); or
(iii) Expand the eligible participants to Universal Service programmes to include parties who are not traditional, historic telephony operators.

Furthermore, there must be consideration of the appropriate mix of contributors to Universal Service funding. Across the region, due to the variety of mechanisms used to authorise services, there is a concomitant differing in the composition of parties who contribute to, and may benefit from, Universal Service funding. Examples include variations such as the situation in Jamaica, where funding is facilitated almost exclusively from a regulatory tax on incoming international minutes (i.e. calls); to frameworks where all service providers are required to contribute, as in Trinidad and Tobago.

3.3.2 Price Regulation of subscriber services

While the nature of the services provided by fixed telecommunications services and fixed subscription broadcasting services are inherently different, the mode of delivery – through the connection of the customer premises to the public network of the provider – provides for the comparison of the regulatory approaches applied to these operators. As discussed in 3.3.1 above, the comparison of the

mode of delivery becomes more relevant as fixed subscription broadcast services, such as cable television operators; migrate horizontally across the market model to provide voice and Internet access services.

Other than the consideration of network access subsidies discussed prior, there is now also the consideration that these subscription broadcast services operate under similar supply constraints as evident for fixed telecommunications providers – critically, their markets are generally monopolistic or oligopolistic in nature due to limited competitive providers. The consumer is therefore found in a situation akin to that which requires the application of price regulatory controls on services provided by service providers deemed to have significant market power (SMP). Without these, as well as the application of associated regulatory cost separation rules, it is possible for subscription TV providers to enter voice markets with cross-subsidised product offerings. This can undermine the fixed voice and Internet service markets, possibly leading to its eventual collapse. Furthermore, it leaves a supplier-constrained market outside the rubric of frameworks geared to protect the consumer from price gouging techniques.

Unfortunately, as broadcasting services were outside the purview of traditional telecommunications sector discourse, with liberalisation there has been a general failure in the provision of appropriate powers over sector regulators to include subscription broadcasting service providers under the rubric of price competition frameworks. While it is not proposed that fixed telephony frameworks be applied without modification, it is clear that to ensure an equitable playing field in the instance of inter-market convergence, there must be some authority for a regulator to act in the best interest of the consumer and market efficiencies. Currently, there is limited applicability of such frameworks across the region.

TABLE 2: PROFILE OF IMPLEMENTATION OF REGULATORY FRAMEWORKS, WHICH MAY BE SHARED ACROSS TELECOMS AND BROADCASTING SECTORS, BY COUNTRY

	CARICOM Member Country	Regulatory agency	Consumer complaints			Retail price regulation			Access to Facilities/ Infrastructure Sharing			Universal Service			
			f	m	STV	f	m	STV	f	m	STV	f	m	Int'l	STV
1	Antigua & Barbuda	Ministry													
2	Bahamas	URCA													
3	Barbados	Ministry													
		FTC		(a)											
		BA													
4	Belize	PUC													
		BBA													
5	Dominica	NTRC		(a)						(a)				(a)	
6	Grenada	NTRC	(a)	(a)						(a)					
7	St. Lucia	NTRC													
8	St. Vincent & the Grenadines	NTRC					(a)								
9	St. Kitts & Nevis	NTRC		(a)			(a)			(a)				(a)	
10	Guyana	PUC													
		NFMU													
		Ministry													
11	Jamaica	OUR													
		SMA													
		FTC													
		BC													
12	Suriname	TAS					(a)								
13	Trinidad & Tobago	TATT													
	Cayman Islands														

4.0 Potential instances of Regulatory Arbitrage

4.1 Fixed to mobile convergence

The areas of regulatory imbalance between the rights afforded to and obligations imposed on fixed and mobile operators act as a particular barrier to the seamless development of business approaches as the markets become increasingly substitutable. As the capacity and throughput of mobile networks increase as mobile operators evolve their infrastructure from 2G to 3G platforms and beyond, there has been a development of new business approaches within the mobile market, which were more traditionally the realm of the fixed line operator. Mobile networks providing Corporate PBX solutions and associated adjunct services are commonplace throughout the region. In this context, the approach to regulating the fixed and mobile operators must be reviewed to facilitate appropriate flexibility and innovation on the part of the operators.

A key framework where revision should be focused to limit the incident of regulatory arbitrage is with regard to the management of radio frequency spectrum. The approach prominent in most jurisdictions, which ties a licence to a particular technology, is not conducive to supporting innovation in service delivery that will result in faster service provision, and lower prices to the consumer. In this regard, a move to frameworks that are technology-neutral would be more appropriate to facilitate the demands of the sector.

Furthermore, there should be consideration of further liberalisation of the spectrum management approach through a review of the costing methodology for in-demand blocks of spectrum. This review will provide for the balancing of the direct monetary opportunity (via spectrum auctions) with the objective of increasing availability of spectrum for services that would deepen Internet penetration (through, for example, utilising the “Digital Dividend” gained from Digital Terrestrial Television migration).

Ultimately, the review of the spectrum management framework should include the development of managed, secondary markets for the trading of spectrum blocks, to facilitate the effective and efficient allocation of resources to ensure the benefit of the public good.

4.2 Regulating provision of Calls and Sessions

4.2.1 International Networks – administration of calls…or sessions

A common theme throughout the consideration of the impact of convergence on regulatory frameworks and practices is the recognition of the transition of telecommunications from call-based, PSTN technologies to session based, IP technologies.

Upon review of regulatory frameworks across the region, it is noted, as mentioned earlier, that there seems to be a distinct variance in the approach to international telecommunications networks and services compared to their domestic counterparts. To an extent this is expected, as a person providing international networks or services would not be subject to many domestic concerns related to network rollout obligations and the like. However, where specific oversight of international networks or services was considered, the frameworks in force are with regard to the management of calls over these facilities. Examples of such frameworks include the Jamaican Universal Service Order, which included a levy on the revenues generated from incoming call minutes; and the reporting requirements of TATT, which also focus on the cost of incoming and outgoing calls over these international facilities.

This limited scope of applicability in practice provides an opportunity for arbitrage, given the growing segment of business associated with the lease, sale or purchase of bandwidth on these facilities for the purpose of the establishment of data/ IP sessions to support services such as Internet provision, among other things. Limited appreciation of the developments in this segment of the international carrier’s business introduces significant information gaps to the rubric of consideration of the regulator.

Use of this bandwidth supports IP-based bypass services, operating without appropriate authorisations. Inequality of information in this instance will mask areas of price gouging, anti-competitive cost in other aspects of data based operations. It is recognised that the power of the regulator to unilaterally adjudicate on such matters would be limited by the inherently cross-border

nature of some of the transactions within this sphere; however, the authority to request particular information sets for analysis is essential for regulator determination of market impact.

The need for closer analysis of international bandwidth routes and costing trends is of particular importance with the migration of VoIP protocols as the preferred form of long haul transport of even voice services. This will impact the profitability and revenue streams associated with international telephony service provision as the prevailing settlement regimes for connectivity slowly switch to peering-oriented regimes.

4.3 Content management and Intellectual Property Rights

4.3.1 Intellectual Property Rights and broadcast rights management

Intellectual Property Rights (IPR), their protection and subsequent monetisation is the foundation of the "knowledge-based" economy. For the region to achieve its stated objective of maximising the benefits of ICT to redound to the benefit of the regional economies, there needs to be more comprehensive concerns of IPR protection in the region – including an understanding of the traditional broadcasting market for IPR, and the impact of that due to activities facilitated by Internet downloads.

Intellectual property rights and the cost of paying for the use of content product is at the heart of the operational costs of broadcasters. These include the payments of royalties for the airplay of music or the broadcast rights to air pre-produced programmes within a jurisdiction, on an exclusive basis or otherwise. In the region, much of the focus on content regulation was directed towards ensuring compliance with Codes geared to restrict the broadcast of sensitive or otherwise offensive content, and in some instances, such as Jamaica, the adherence to minimum local content requirements within the programming schedule. In the context of this limited oversight, it is noteworthy that the decidedly hands-off approach to broadcasting service regulation in the region has left the size of the broadcast rights market in the Caribbean largely unquantified. Therefore this significant aspect of IPR administration, i.e. broadcast rights management, remains an under-considered, and non-evaluated segment of the ICT economy.

This is a pressing issue, as content originally broadcast in one jurisdiction is being made available online by third parties for public download by anyone that accesses the website. This compromises the IPR of the content producers, and also threatens the viability of traditional broadcast revenue, taking into consideration the depreciation of the value of the domestic (or regional) broadcast market if the offshore product is already viewed by the majority of the prospective audience. This example of the Internet as a channel for distribution and broadcasting is merely one aspect of the impact of content piracy on traditional forms of content-based commerce.

Across the region, there does not seem to be any frameworks that address the protection of IPR in traditional and new media channels. With regard to broadcasting services across the region, only two jurisdictions – Trinidad and Tobago and Jamaica – have confirmed the obligation of Subscription Television providers to acquire the appropriate rights for the broadcast of non-domestic channels in their jurisdictions. With regard to Internet services, there are no jurisdictions with any articulated position, strategy or regulatory procedure to systematically address concerns of illegal Internet piracy.

4.3.2 Network Neutrality

Net neutrality is based on addressing the issue of data packet discrimination so as to mitigate against the application of significant market power within the content domain.

In this regard, the regulatory framework can seek to achieve either:

(i) The restriction of the owners/controllers of transport/communications providers from owning/controlling broadcasting or media production firms; or

(ii) The application of non-discrimination principles applied to interconnection and wholesale services in the PSTN to the data sphere; or

(iii) A combination of both.

Upon review of governing legislation in the five (5) jurisdictions where broadcasting services are regulated in manners other than spectrum-related, it was found that in Barbados, Bahamas and Jamaica, there is a common provision which restricted the ownership/controlling interest of persons controlling other domestic (or parish) media/distribution channels (e.g. local newspapers etc.) from

gaining broadcasting licences. In recognising the power of information and its influence on the general populace, it seems that these provisions are driven to limit the monopolisation of information channels by a corporate entity or other person. While such provisions can be adjusted to have the effect of (i) above, the **Jamaican Electronic Media Regulatory and Policy Framework** of 2010 seeks to abandon such an approach, recognising the need for investment into the media sector for continued growth.

Notably, the Jamaican Broadcasting Commission was one of only two entities interviewed that grasped the relevance of network neutrality, and recognised that there needed to be some level of collaborative framework to first identify where the potential for the mischief is apparent, and thereafter act affirmatively to limit any anti-competitive packet discrimination practices if the need arises.

4.4 Equivalent Oversight of IP-based Networks

The establishment of IXPs and appropriate Top Level Domain (TLD) Administration are areas of Internet governance generally outside the rubric of traditional telecommunications regulators. In the first instance, IXPs are generally market-driven to encourage cost efficiencies in markets, while TLD administration has long been delegated to non-governmental organisations (NGOs), particularly in educational institutions throughout the region. The relevance of both of these issues has been raised due to policy implications which have surfaced in the use of ICTs to spur economic and social development.

The establishment of IXPs have now been identified as a key enabler and catalyst to domestic Internet economic activity – resulting in the development of more robust online-based services where more of the value chain elements remain onshore. Furthermore, IXPs have been identified as a fundamental component of the cyber-resiliency and cyber-security of the Internet infrastructure of a jurisdiction. As such, there has been increased focus by administrations across the region to encourage IXP peering points – equivalent to the interconnection within the PSTN – which have as yet been delayed by the commercial concerns of market players.

Similarly, the importance of TLD administration in encouraging online innovation and development in online product development has previously been discussed at length. When the Internet first emerged in the early 1990s, ICANN – the corporation delegated with the responsibility for managing the domain name service of the Internet – liaised with interested parties worldwide (and largely in the tertiary education system) in the establishment of a distributed TLD administration system. Later still, governments including those within the region outsourced this function to third parties to manage this facility on their behalf. While this model of outsourcing operations to NGOs is still relevant and attractive, regional governments must review the framework through which government policy towards usage development is reflected in the arrangement. This is critical in order to maximise the use of this resource as an incentive to encourage particular online practices geared toward growing the regional online community, both commercially oriented and otherwise.

With regard to IXPs, Barbados has established regulations to license such operators, the first step to facilitate the establishment of such a facility in their legislative framework. This advancement, and others akin to it, has not been reflected anywhere else in the region.

With regard to TLD administration, Barbados, Grenada and St. Lucia all include the role of TLD administrator within the function of the regulatory body. Antigua, Bahamas, St. Vincent and the Grenadines, and Trinidad and Tobago all refer to direct or indirect outsourcing agreements with commercial third parties. Notably, Jamaica still cites the responsibility as under the purview of the UWI Mona Campus.

However, overall, there seems to be little direct strategy for affirmative use of these resources to enhance the IP-based telecommunications infrastructure in the region. Given the nature of market developments worldwide, this is a significant indictment on the collective direction of regulation of the sector across the region.

TABLE 3: PROFILE OF IMPLEMENTATION OF EMERGING REGULATORY FRAMEWORKS TO SUPPORT CONVERGENCE OF TELECOMS AND BROADCASTING SECTORS, BY COUNTRY

	CARICOM Member Country	Regulatory agency	domestic IP inter-connect	Net Neutrality	Anti-Piracy Framework	Flexible Spectrum Management	Digital Terrestrial Broadcasting	ENUM	TLD Admin
1	Antigua & Barbuda	Ministry							
2	Bahamas	URCA					Discussion paper		
3	Barbados	Ministry							
		FTC							
		BA							
4	Belize	PUC							
		BBA							
5	Dominica	NTRC							(a)
6	Grenada	NTRC							
7	St. Lucia	NTRC							
8	St. Vincent & the Grenadines	NTRC							(a)
9	St. Kitts & Nevis	NTRC							(a)
10	Guyana	PUC							
		NFMU							
		Ministry							
11	Jamaica	OUR							
		SMA					Discussion paper		
		FTC							
		BC					Discussion paper		
12	Suriname	TAS							
13	Trinidad & Tobago	TATT					Discussion paper		
	Cayman Islands								

5.0 Conclusions and Recommendations

Upon review of the findings of the research, it can be surmised that while there is a need to review the regulatory frameworks established by the relevant Telecommunications Acts passed throughout the region in the early 2000s, many of the instances of regulatory arbitrage within the telecommunication sub-sector that are experienced today are due to subsidiary Regulations, Orders or operational mores which can be modified and addressed within the rubric of existing regulatory frameworks. For example, the determination of dominance (and where appropriate co-dominance) of parties other than the incumbent can be achieved largely through existing legal frameworks. Such determinations can be used to address to a great extent some of the regulatory imbalances seen within the telecommunications sector today.

This by no means advocates the application of overly stringent regulatory tools or paradigms, but instead merely highlights that many of the tools to treat with legacy issues are not outside the realm of the wider regulatory frameworks already established. Furthermore, many of the provisions in primary legislation associated with telecommunications networks can be readily applied to subscription broadcast networks with minimal adjustment, even when this may be necessary.

The areas where there is a need for considerable work across the region include the recognition that broadcasting requires more regulatory oversight than the issuance of spectrum licences and the mitigation of radio frequency interference. Content, and the IPR management scheme that supports it, requires a more involved analysis if the region is to appreciate the risks and opportunities to this sector associated with the explosion of Internet access that is being facilitated. While this review may assist in appreciating the economic profile associated with the import of foreign programmes into the region, the oversight of broadcast programme practices should also be the keen subject of

consideration for policy makers in the context of addressing issues such as cultural identity and sustainability.

This consideration of appropriate IPR management by the administration, industry participants and users becomes a key focal point for the development of new regulatory frameworks that will treat with convergence in service provision. In this regard, the frameworks necessary to manage concerns such as network neutrality, which is largely seen as not relevant in the region thus far, are already enshrined within many of the regulatory frameworks across the region. This must be recognised and harnessed, so that jurisdictions are better prepared to manage situations which are on the regional doorstep, but largely unmonitored.

However, the modification of primary and secondary legislative frameworks must first be pursued to limit the broadening and deepening of intra-sector regulatory imbalances going forward. To this end, the rationalisation of authorisation regimes is critical to provide for different types of telecommunications and broadcasting service providers equally, transparently and with reduced bureaucracy; in conjunction with the adjusting of the paradigm that sees resources such as spectrum primarily as sources of revenue, to the detriment of the approach which afforded access to the resource so as to benefit innovation in service delivery.

6.0 Bibliography

- **Antigua & Barbuda**
  - Telecommunications Act, Cap. 423
- **Bahamas**
  - Communications Act, 2009
  - Interim Code of Practice for Broadcasting Content
- **Barbados**
  - Telecommunications Act, 2001, Cap. 282B
  - Telecommunications (Regulated Services) Order, 2003
  - Telecommunications (Regulated Services) Order, 2006
  - Telecommunications (Universal Service) Regulations, 2003
  - Telecommunications (Interconnection) Regulations, 2003
  - Telecommunications (declaration of dominance) Regulations, 2005
  - Fair Competition Act. 2002, Cap. 326C
  - Fair Trade Commission Act, 2002, Cap. 326B
- **Belize**
  - Telecommunications Act, 2002
  - Telecommunications Interconnection and Infrastructure Sharing (Rates, Fees and Charges) Regulations, 2010
  - Broadcasting and Television Act, 2003, Chap 227
- **Dominica**
  - Telecommunications Act, 2000
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Licensing & Authorisation) Regulations
  - Telecommunications (Private Network Licensing) Regulations
  - Telecommunications (Spectrum Management) Regulations
  - Telecommunications (Universal Service Fund) regulations
  - Telecommunications (Quality of Service) Regulations
- **Grenada**
  - Telecommunications Act, 2000
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Licensing & Authorisation) Regulations
  - Telecommunications (Private Network Licensing) Regulations
  - Telecommunications (Spectrum Management) Regulations
  - Telecommunications (Universal Service Fund) regulations
  - Telecommunications (Quality of Service) Regulations

- **Guyana**
  - Public Utilities Act, 1999
  - Telecommunications Act, 1990, Chap 47:02
  - Post and Telegraph Act, Chap 47:01
- **Jamaica**
  - Broadcasting and Radio Re-Diffusion Act (1949)
  - Broadcasting and Radio Re-Diffusion (Amendment) Act, 2008
  - Jamaican electronic Media Regulatory and Policy Framework (2010)
  - Telecommunications Act, 2001
  - Fair Competition Act
  - Quality of Service Standards and Guidelines for the Telecommunications Sector, (consultative document) 2010
- **St. Kitts**
  - Telecommunications Act, 2000
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Licensing & Authorisation) Regulations
  - Telecommunications (Private Network Licensing) Regulations
  - Telecommunications (Spectrum Management) Regulations
  - Telecommunications (Universal Service Fund) regulations
  - Telecommunications (Quality of Service) Regulations
- **St. Lucia**
  - Telecommunications Act, 2000
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Licensing & Authorisation) Regulations
  - Telecommunications (Private Network Licensing) Regulations
  - Telecommunications (Spectrum Management) Regulations
  - Telecommunications (Universal Service Fund) regulations
  - Telecommunications (Quality of Service) Regulations
- **St. Vincent & the Grenadines**
  - Telecommunications Act, 2001
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Licensing & Authorisation) Regulations
  - Telecommunications (Private Network Licensing) Regulations
  - Telecommunications (Spectrum Management) Regulations
  - Telecommunications (Universal Service Fund) regulations
- **Trinidad and Tobago**
  - Telecommunications Act, 2001
  - Telecommunications (Interconnection) Regulations
  - Telecommunications (Access to Facilities) Regulations
  - Authorisation Framework for Telecommunications Networks and Services, 2005
  - Universality of Telecommunications Services in Trinidad and Tobago (consultation document), 2008
- **Cayman Islands**
  - Information and Communications Technology Authority Act, 2006

Chapter 2: Globally Comparable Caribbean ICT Survey Instruments and Baseline Status of National ICT Data Acquisition

1.0 Introduction

Since the 1980s, information has been recognised to be a factor of production that is of equal importance to land, labour, capital and entrepreneurship. The culture of data collection and use in formulating development plans has been more pronounced in the more developed countries than in the lesser developed countries. This has resulted in a dichotomy if one considers the ability of the developed countries to use data and more markedly, the information and communication technologies to produce greater productivity and wealth; as opposed to the general observation of data poverty and relative underdevelopment of ICT in the developing world.

The activities of the WSIS may have emerged from the United Nations Millennium Declaration, which showed the need to agree upon a group of indicators (including ICT indicators) of the socioeconomic development of the countries. The MDG Goal 18 identifies the need for national measurement for comparative purposes, with a view to closing the observed gap in ICT endowment:

> *"The WSIS was held in two phases, with the first phase in Geneva in 2003 and the second phase in Tunis in 2005, to establish a clear vision for building an inclusive global Information Society. Since the WSIS, a strong body of empirical evidence has developed which proves conclusively that Information and Communication Technologies (ICTs) are important drivers promoting social development and economic growth. However, in 2008–09, the outbreak of the global financial crisis challenged policymakers around the world in maintaining economic growth and preserving progress towards achieving the WSIS targets and Millennium Development Goals (MDGs) by 2015."*[1]

The above quotation establishes the necessity of data as a prerequisite to arriving at a clear assessment of the inclusiveness of the global Information Society. OSILAC, with help from IDRC, has been working towards the achievement of this objective for the countries of the region, i.e. Latin American and Caribbean countries. The Compendium of Practices on the implementation of ICT questions in households and business surveys in Latin America and the Caribbean of 2010, prepared by OSILAC, lists its objectives as follows:

- *To collect and organise the main developments in the design and implementation of questions regarding the access and use of ICT in the household and business surveys of the countries of the region.*
- *To report the measurement agreements achieved by the countries of the region that collected data on ICT in the framework of their household and business surveys.*
- *To serve as a reference, or support material, for the persons responsible for both the design and implementation of the ICT questions, and the definition, calculation and analysis of the ICT indicators in the countries of the region.*
- *To enable the exchange of implementation experiences among the organisms and institutions that produce statistical data on ICT in the countries of the region*.

The present work aims at proposing a standard questionnaire that would be applicable to the countries of the sub-region, taken to mean the English-speaking countries of the Caribbean. An

[1] Source of above paragraph: Report on the WSIS Stocktaking 2010: Tracking progress

essential part of the questionnaire would be the production of an interviewer's manual to assist in the understanding of the questions and guidance to the persons interviewed as they answer the questions.

It is fully understood that the compilation of ICT indicators is not seen as an end in itself, but as an input into decision-making processes among governments, researchers and regulators working towards the development of the information society in the countries of the region and sub region. The focus of this exercise is on the countries of the sub-region.

It is opportune to register the difference between a statistic and an indicator. A statistic is a figure arrived at through research and measurement of a concept or phenomenon that is capable of direct measurement. An example of a statistic is the Gross Domestic Product. On the other hand, an indicator, as the name implies, is an indirect measure of a concept or actuality that is not capable of direct measurement in and of itself, but is correlated to a determinant to which one may wish to put an estimate.

The standard core questionnaire to be developed for the sub-region aims generally at the following, which was the result of inter-country collaboration at the OSILAC fora on indicators.

OSILAC - List of Indicators Proposed for the Regional Plan of Action eLAC2015

Complete list of indicators agreed by OSILAC/Partnership

A. Core indicators on ICT infrastructure and access

Core indicators

Al Fixed telephone lines per 100 inhabitants
A2 Mobile cellular telephone subscriptions per 100 inhabitants
A3 Fixed Internet subscribers per 100 inhabitants
A4 Fixed broadband Internet subscribers per 100 inhabitants
AS Mobile broadband subscriptions per 100 inhabitants
A6 International Internet bandwidth per inhabitant (blts/second/lnhabitant)
A7 Percentage of the population covered by a mobile cellular telephone network
A8 Fixed broadband Internet access tariffs per month in US$, and as a percentage of monthly per capita income
A9 Mobile cellular telephone prepaid tariffs per month in US$, and as a percentage of monthly per capita income
Al0 Percentage of localities with public Internet access centres (PIACs)
(Source: Partnership on Measuring lCT for Development (2010)).

B. Core indicators on access to, and use of, ICT by households and individuals

Core Indicators

HHl Proportion of households with a radio
HH2 Proportion of households with a television set (TV)
HH3A Proportion of households with telephone any telephone
fixed telephone only
mobile cellular telephone only
both fixed and mobile cellular telephone
HH4 Proportion of households with computer
HHS Proportion of individuals who used a computer in the last 12 months
HH6 Proportion of households with Internet access
HH7 Proportion of individuals who used the Internet in the last 12 months
HH8 Location of individual use of the Internet in the last 12 months
Home
Work
Place of education
Another person's home

Community Internet access facility
Commercial Internet access facility
Any place via a mobile cellular telephone
Any place via other mobile access devices

HH9 Internet activities undertaken by individuals in the last 12 months
Getting information about goods or services
Getting Information related to health or health services
Getting information from general government organisations
Interacting with general government organisations
Sending or receiving e-mail
Telephoning over the Internet/VoIP
Posting Information or instant messaging
Purchasing or ordering goods or services
Internet banking
Education or learning activities
Playing or downloading video games or computer games
Downloading movies, images, music, watching TV or video, or listening to radio or music
Downloading software

HH10 Proportion of individuals who used a mobile cellular telephone in the last 12 months

HHll Proportion of households with access to the Internet by type of access
Narrowband
Fixed broadband
Mobile broadband

HH12 Frequency of individual use of the Internet in the last 12 months

Recommendations have been made for the collection of more indicators, but these are outside the scope of this exercise. The present effort is confined to the collection of indicators from the household and business sectors. The latter survey, i.e. the one that concerns businesses, contains questions directed to Service Providers and Specialised Public Agencies. These include the following:

- Land Line Providers
- Mobile Providers
- Internet Providers
- Cable TV Service Providers
- Ministry of Community Development
- National Library and Information Services

The modality of collecting such data has been identified as the survey route. To this extent, IDRC and OSILAC have provided resources for the conduct of a household survey in Jamaica, whereby the statistical unit will be the household as well as the individual within the household. That survey has been conducted and results are pending.

In 2007, The Telecommunications Authority of Trinidad and Tobago (TATT) commissioned a survey of households and individuals to obtain an idea of ICT presence and use in Trinidad and Tobago. The other survey to update the data on the business sector is being planned by TATT. As at December 2010, the process of identifying the consulting firm to conduct the survey was still being undertaken. An idea of the questions asked in this survey can be derived by examining the questionnaire used in the previous survey, and matching these questions with the needs as articulated in the WSIS and OSILAC lists of core indicators.

Both survey instruments are expected to collect the same basic information as was collected in earlier surveys. However, in light of the OSILAC partnership, the countries are expected to collect a wider and more detailed dataset than the basic questions for which data were collected in the year 2000 Population and Housing Census.

2.0 Framework for the selection of indicators for the households and individuals sector

The core list of indicators as prepared by OSILAC is divided into two main parts. The first concerns the ICT infrastructure that is already in place in any given country, and seeks to identify the type of data

that can be provided by relevant administrative data or through the assistance of the service providers. This type of information is administrative in nature in that it was not collected expressly for the purpose of the survey. The second part is concerned with core indicators on access to, and use of ICT by households and individuals. This necessitates the collection of primary data from households and individuals within these households. In terms of fulfilling a mandate to collect updated statistics on ICT, the updating of the core indicators requires periodic surveys of households and business establishments.

The OSILAC compendium discusses the question of periodicity and through data collected from the countries, and it shows that there is no consensus as to the periodicity of conduct of the survey to which the countries will easily agree. This is derived from the human resource endowment of the agencies collecting the data. It was assumed in the OSILAC forum that the National Statistical Offices would undertake the survey, but this may not be the case for all of the countries, given that there are a number of micro-states with very small Statistical Offices and budgets that cannot provide the resources to produce basic social and economic datasets, let alone ICT indicators. For some countries to be a part of the digital divide research, financial and human resources may have to be provided to assist in the effort.

The Caribbean countries have reported their efforts to collect data on the digital divide through the vehicle of household surveys. This is reflected in the OSILAC document entitled “Analysis of the results of the Survey applied to the NSOs in the countries of Latin America and the Caribbean, March 2010”. A parallel analysis of the responses of the Latin American as separate from the Caribbean NSOs is provided, which reveals very little work done by the Caribbean NSOs on ICT data gathering. Reasons given for this include a general lack of interest; the unimportance of the subject matter in the scheme of NSO matters; and a significant lack of preparation by way of budget or manpower, with a dim prognosis of amelioration in the near future in the absence of external funding. A table compiled by OSILAC and included in this report shows that, with the exception of Jamaica and Bermuda, the Caribbean countries have included less than ten ICT questions in their Population Census Questionnaires. Part of the reason for this may be that the preference would be to conduct a separate ICT survey, and therefore not burden the Census Questionnaire with more questions that may increasingly jeopardise the response rate and quality of its responses. Another reason may be a revealed disinterest in the subject. Table 1 indicates the number of ICT questions in the Population Census.

TABLE 1: EXCERPT FROM OSILAC REPORT ON 2010 SURVEY

Preg A.2 Has your Institution included some of the key questions on ICT access and use in the conduction of census, surveys or other statistical operations between 2009 and 2010?			Population and Housing Census		Multi-purpose household surveys or living conditions surveys		Employment or income and expenses surveys		Census or surveys of businesses from the commerce or service sector		Census or surveys of industrial facilities (Manufacturing Sector)		Technological innovation surveys		Specific surveys on ICT access and use by households and individuals		Specific surveys on ICT use in businesses		Continuous Household Survey (quarterly)	
	Countries Caribbean	Yes	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010	2009	2010
			Number of questions including																	
1	Anguilla	x	-	-	5	-	-	-	-	-	-	-	-	-	11	-	-	-	-	-
2	Bahamas	x	-	2	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-
3	Barbados	x	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Bermuda	x	-	3	-	-	-	-	-	10	10	10	-	-	-	-	-	-	-	-
5	British Virgin Islands	x	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Cayman Islands	x	-	6	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Dominica	x	-	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Grenada	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Jamaica	x	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Montserrat	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	R. of Trinidad & Tobago	x	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	St. Kitts And Nevis	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Suriname	x	-	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	2	2
14	Turks and Caicos Islands	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total countries 14	**10**																		
	Total Questions		**0**	**27**	**15**	**12**	**9**	**0**	**0**	**10**	**15**	**10**	**0**	**0**	**11**	**0**	**0**	**0**	**2**	**2**
	Total country by research		0	7	4	2	2	0	0	1	2	1	0	0	1	1	1	0	0	0
	[8]Percentage (%)	**71.4**	**0.0**	**50.0**	**28.6**	**14.3**	**14.3**	**0.0**	**0.0**	**7.1**	**14.3**	**7.1**	**0.0**	**0.0**	**7.1**	**7.1**	**7.1**	**0.0**	**0.0**	**0.0**

[8] The percentage is calculated on a total of 14 countries that responded to the survey

In the Caribbean, the Population and Housing Census is still the main instrument for the collection of this type of data. Because of the need to update the indicators as collected in census or survey activity at intervals shorter than the ten years between Censuses, a survey is suggested as the appropriate instrument that would deliver quality data at a periodicity shorter than decennial. The discussion among the OSILAC partners revealed differing reported capabilities of collecting the data at given periodicities. Some countries favoured annual surveys, some suggested two-year lapses in survey-taking, while others were not comfortable with a time lapse greater than two years. Under the circumstances, this report proposes a dedicated ICT survey every three years. This will provide ample time to have the survey data processed, published and used by the relevant authorities, not only for reporting, but more importantly, for use in narrowing the digital divide in accordance with the objective of MDG 18. As previously cautioned, some Caribbean countries do not currently possess a household survey capability, but have, however, reached close to having the knowledge to conduct a household survey. This new capability has been more or less put in place through the MECOVI[2] project in the OECS countries and the SPARC[3] project of the IADB and the Caribbean Development Bank. National budgets and the paucity of human resources in statistics make compliance with the three-year commitment a difficult task for the OECS countries, with the possible exception of one. Table 2 reports the responses of the Caribbean countries to the question "**How could OSILAC and the WORKING Group on ICT of the SCA contribute to the coordination among the different Statistical data producers in each country**?"

[2] **MECOVI** is short for "Programa para el Mejoramiento de las Encuestas y la Medición de Condiciones de Vida" (Programme for the Improvement of Surveys and the measurement of Living Conditions)

[3] **SPARC** is the acronym for "Support to Poverty Assessment and Reduction in the Caribbean"

TABLE 2: "HOW COULD OSILAC AND THE WORKING GROUP ON ICT OF THE SCA CONTRIBUTE TO THE COORDINATION AMONG THE DIFFERENT STATISTICAL DATA PRODUCERS IN EACH COUNTRY?"

COUNTRY	RESPONSES
Anguilla	Advocacy and informing departments of government that they do not have such statistical capacity or understanding of survey design and analysis
Bahamas	No comments
Barbados	Technical assistance in developing human capacity for analysing ICT phenomena
Bermuda	No comments
British Virgin Islands	Apart from collaborative efforts between the Development Planning Unit and the Telecommunications Regulatory Commission with regard to the collection of ICT statistics, there is limited coordination between both public and private other stakeholders. OSILAC and the SCAs Working Group on ICT can assist in reiterating the importance of ICT statistics on the national as well as regional level, particularly in addressing how such information can be used for policy generation and for comparative purposes. In addition, expertise on survey design, implementation and analysis would also be useful.
Cayman Islands	No comments
Dominica	Cross-ministerial training
Grenada	No comments
Jamaica	No comments
Montserrat	No comments
Trinidad and Tobago	If the CSO attends this process, then an agreement should be made with OSILAC & CSO to pioneer the collection of these new statistics in Trinidad and Tobago. Collaboration would be made internally with the CSO and these other government ministries: Education, Health, and Public Administration. CSO can then report their progress, or lack thereof, back to OSILAC. These institutions may not respond to OSILAC efforts directly.
St. Kitts and Nevis	No comments
Suriname	No comments
Turks and Caicos Islands	No comments

The above table demonstrates the position of the Caribbean countries. In another survey, most of these countries still operate in the 1940 to 1960 mode – that of being departments or Divisions of a Ministry such as the Ministry of Finance or the Ministry of Planning. Despite recommendations of the United Nations and the European Commission that the Statistical Offices should be modernised, taken out from under a parent ministry, and organised as an office, with executive status; it is apparent that there is little enthusiasm in the Statistical Offices to embark upon that route.

Table 3 analyses the OSILAC indicators for the attributes of:

- Relevance or benefit
- Validity
- Quality of data that can be collected
- Reliability
- Simplicity
- Accessibility

Indicators should disaggregate and segment by age, sex, income level and geographic area. The categorisation of **Relevance/Benefit** speaks to the relevance of the indicator and its benefit to the measurement of the digital divide. If the indicator is relevant, it is more than likely to benefit the research. If the indicator is of low relevance, then it is not likely to provide much benefit to knowledge in the exercise.

The indicator may be high in relevance, but if its correlation with a reality by which it is not reflected is low, the indicator will be of low **validity**.

The **quality of data collected** is a function of one or more of a number of situations. The simplest example is the quality of the field research and enquiry to elicit the data from the

respondent. If the question is not asked in an unbiased manner as designed by the NSO, the data collected will run the risk of reflecting the bias of the interviewer, and therefore not being reflective of the wider group that responded to the survey. The score "Moderate" would indicate the need for improvement to the indicator receiving that score.

A. Core Indicators on ICT Infrastructure and Access

Indicators	Relevance/ Benefit	Validity	Quality of data collected	Reliability	Simplicity	Accessibility
AI Fixed telephone lines per 100 inhabitants (blts/second/Inhabitant)	High	Moderate	Moderate	Moderate	High	High
A2 Mobile cellular telephone subscriptions per 100 inhabitants	High	Moderate	Moderate	Moderate	High	High
A3 Fixed Internet subscribers per 100 inhabitants	Moderate	Moderate	Moderate	High	High	High
A4 Fixed broadband Internet subscribers per 100 inhabitants	Moderate	Moderate	Moderate	High	High	High
A5 Mobile broadband subscriptions per 100 inhabitants	Moderate	Moderate	Moderate	High	High	High
A6 International Internet bandwidth per inhabitant	Moderate	Moderate	Moderate	High	High	High
A7 Percentage of the population covered by a mobile cellular telephone network	Moderate	Moderate	Moderate	Less than moderate	High	High
A8 Fixed broadband Internet access tariffs per month in US$, and as a percentage of monthly per capita income	Moderate	Moderate	Moderate	High	High	High
A9 Mobile cellular telephone prepaid tariffs per month in US$, and as a percentage of monthly per capita income	Moderate	Moderate	Moderate	High	High	High
AI0 Percentage of localities with public Internet access centres (PIACs)	High	High	High	High	High	High

The **reliability** score reflects the degree to which the indicator leads to a good assessment of the situation being researched. If one is trying to assess the use of ICTs by asking if there is a computer in the house, the response received may be correct; however, the purpose behind the question would not have been achieved. There might indeed be a computer in the house, but it may not actually be in use by the persons in the household. Therefore, the question itself is not necessarily a reliable indicator of use. Reliability reflects the degree of correlation between the indicator and the reality. The assessments of high, moderate and poor therefore reflect correlation coefficients.

Simplicity refers to the ease with which the question can be answered. In the case of the use of administrative data, one would expect that the number of telephone lines in a given country would be

an easy question, as this can be answered from the administrative records of the Government Department or firm in charge of keeping records on the number of people owning land lines.

Accessibility refers to the ease with which the private citizen may seek and find the indicator under review.

TABLE 3: ANALYSIS OF OSILAC INDICATORS

A. Core indicators on ICT infrastructure and access

B. Core indicators on access to, and use of, ICT by households and individuals

Indicators	Relevance/ Benefit	Validity	Quality of data collected	Reliability	Simplicity	Accessibility
HHl Proportion of households with a radio	High	High	Moderate	Moderate	High	Moderate
HH2 Proportion of households with a television set (TV)	High	High	Moderate	Moderate	High	Moderate
HH3A Proportion of households with telephone any telephone fixed telephone only mobile cellular telephone only both fixed and mobile cellular telephone	High	High	Moderate	Moderate	High	Moderate
HH4 Proportion of households with computer	High	High	Moderate	Moderate	High	Moderate
HH5 Proportion of individuals who used a computer in the last 12 months	High	High	Moderate	Moderate	High	Moderate
HH6 Proportion of households with Internet access	High	High	Moderate	Moderate	High	Moderate
HH7 Proportion of individuals who used the Internet in the last 12 months	High	High	Moderate	Moderate	High	Moderate
HH8 Location of individual use of the Internet in the last 12 months Home Work Place of education another person's home community Internet access facility Commercial Internet access facility Any place via a mobile cellular telephone Any place via other mobile access devices	High	High	Moderate	Moderate	High	Moderate

HH9 Internet activities undertaken by individuals in the last 12 months Getting information about goods or services Getting Information related to health or health services Getting information from general government organisations Interacting with general government organisations Sending or receiving e-mail Telephoning over the Internet/VoIP Posting Information or instant messaging Purchasing or ordering goods or services Internet banking Education or learning activities Playing or downloading video games or computer games Downloading movies, images, music, watching TV or video, or listening to radio or music Downloading software	High	High	Moderate	Moderate	High	Moderate

HH10 Proportion of individuals who used a mobile cellular telephone in the last 12 months	High	High	Moderate	Moderate	High	Moderate
HHll Proportion of households with access to the Internet by type of access Narrowband Fixed broadband Mobile broadband	High	High	Moderate	Moderate	High	Moderate
HH12 Frequency of individual use of the Internet in the last 12 months	High	High	Moderate	Moderate	High	Moderate

The analysis of the OSILAC indicators in terms of:

Relevance/Benefit	Validity	Quality of data collected	Reliability	Simplicity	Accessibility

As was demonstrated above, this would be the case of the indicators addressed in the Jamaican Survey. These characteristics of relevance, validity, quality of data collected, reliability, simplicity and accessibility are derived for the most part from the modality of data collection, i.e. the survey. The attributes of Moderate reflect the issue of the veracity of response, as memory recall – of which a period of 12 months was used in the questionnaire – may have reflected a defective telescopic view of the past. The 12-month period of recall runs the risk of being too great a timeframe with regard to assessing ICTs, as advances are too rapid to maintain relevance with the situation of 12 months prior. If an individual were to shut off his or her computer for 12 months and then resume operations, that individual would witness a significant paradigm change in the computing environment known twelve months prior.

3.0 Other Data Collection Efforts

The OSILAC documentation was the main modality of acquiring data on the country situations. The reports made in those documents were in accord with information that is generally known. However, in the interest of greater transparency, a number of countries were polled for their comments that could be added to the present documentation. As many of the countries are in the process of their Census taking and processing, not all of them responded to the request for information. The following table indicates the responses.

TABLE 4: RESPONSES FROM CARIBBEAN COUNTRIES ON ICT PROGRAMME ACTIVITY

QUESTION	ANU	BGI	DOM	GDA	GUY	SVG	SLU	SUR
Apart from POPCEN, do you collect data on ICT indicators?	Yes	No	Yes	No	Yes	Yes	Yes	Yes
Other data agencies that collect that type of data?		No	No	No	Yes	Yes	Yes	No
CSO priority for collecting such data*		5	3	5	3	1	1	5
Does CSO have human resources to conduct ICT survey thru h/hold survey?		No	No	Yes	Yes	No	Yes	No
What statistics of ICT have you contributed to CARICOM data collection?		Indicators	ns	ns	Indicators	Indicators	Indicators	

Priorities are stated on a scale from 1 to 5 where 1 is the highest priority, and 5 is the lowest.

The above responses confirm the relatively low priority accorded to ICT statistics by the National Statistical Offices. This is not due to a lack of interest, but to the inelasticity in the number of resources to bring to bear on issues such as ICT statistics, when there are more pressing needs for statistics on GDP, Balance of Payments and Retail Price Indexes. Notably, the majority response to whether the Statistical Offices have the human resources to conduct ICT surveys was "No". There will be the need to contract field staff to do the survey. This dependence on extra-budgetary assistance means that the NSOs do not have the "on board" capacity to conduct an ICT survey.

When asked what their contribution to the CARICOM data collection initiative on ICT was, the majority of respondents stated that they contributed by providing indicators. In most cases, these were confined to at most five indicators that arose from the Census questionnaire, or the relevant questionnaire in countries that conducted a Living Standards survey.

The fact that many of the Chiefs of statistics from the Caribbean countries did not attend the OSILAC meetings may reflect the perception in the minds of those Heads of the importance of the series, as relative to their other priorities as reflected in the priority ratings as above.

4.0 Approaches to the Design of a Pan-Caribbean ICT Survey Instrument

4.1 Objectives

One of the main objectives of this work was to collect, collate and analyse data relating to ICT access and usage by various categorisations. Following the guidelines and data objectives of WSIS and reinforced by observations of survey work undertaken elsewhere including countries in the Caribbean, the survey instrument should capture data on ICT indicators as defined by the International Telecommunications Union (ITU). A major feature of the survey was that it should collect social and economic data that would put the analysis of the ICT data collected into context. This would, in turn, provide a clear view of the nature of the ICT services, including the gaps in access and utilisation, as well as the reasons for these gaps. The survey data would feed into the design of strategies to monitor the digital divide and to point to strategies that would overcome the access and usage barriers, clearing the way for ICT-predicated development in the country.

4.2 Comments on the Jamaican Survey

The UWI/STATIN questionnaire has been developed against a background of a well-established national household survey capability, which is not available in the other Caribbean countries with the exception of Barbados, Guyana and Trinidad and Tobago. That survey instrument presents a more complete body of relevant information than can be afforded by the collection of the indicator data as presented in the OSILAC list. It is fully understood that the OSILAC list was not intended to be a data collection vehicle, in that it deliberately avoids focus on characteristic and demographic data elements that must be collected in a questionnaire to make the ICT data useable in a meaningful manner. The attributes of toilet facilities, income, employment status and other population and demographic attributes serve to put the ICT situation into proper perspective as against the social and

economic advances being registered at national level. Once these data are captured at national level, a statement of the sub-regional situation can be made.

A dedicated survey, such as the Jamaican survey, collects data that are useful adjuncts to the analysis of ICT demand, provision, use and ability of ICT consumers to pay. An ordering of priorities may be deduced from the analysis of use against a number of housing and other infrastructure attributes such as toilet facilities and other such attributes. A properly designed and completed questionnaire will indicate over time the situation of the household as a reasonable statistical unit in the measurement of the digital divide. It is possible that the very definition of "household" could be questionable, as societal changes influence meal arrangements and other domestic interfaces. As is well known, a household is defined to be a number of individuals in a dwelling unit who share at least one meal daily. There can therefore be one or more households in any given dwelling unit.

The questions designed for all household members locate the individuals in terms of their relationship to the acknowledged head of the household. In addition to relationship to the head of household, the survey instrument collects data on:

1. Sex
2. Age at last birthday
3. Religion
4. Ethnicity
5. Literacy
6. Highest level of education attained
7. Employment status (paid employee, self-employed, etc.)
8. Main occupation
9. Income (to estimate monthly or annual income)

Another section of the questionnaire collects data on housing features, and Section C of the questionnaire collects data on household access to Information and Communication Technologies (ICT). Within the household, there is one respondent. That person would be the most knowledgeable in ICT, and may not necessarily be the head of the household. The relationship between the respondent and the household head is therefore captured. Age and sex data are captured. Respondents under the age of 16 years have an older household member present at the interview.

The design of the questionnaire is useful in that it incorporates all of the indicators as proposed in the OSILAC list. The demographic and infrastructural section that addresses housing and electricity form the background against which the core data on ICT can be analysed. It is sectioned to address different categories of user and use. The statistical unit is the household selected along the same lines as the selection of households in, for example, a survey of living conditions. Within the households selected, an individual is selected by a random process with the proviso that the individual must be over the age of 10 years.

The length of the questionnaire vindicates the conduct of a separate purpose-specific survey on ICT in a country with a well-established national household survey capability. All countries in the Caribbean would be comfortable with the formulation of the questions in the questionnaire, but may experience varying degrees of applicability of questions. A different questionnaire – one that captures the main questions of the suggested list of questions of the Partnership (the same questions as referenced by the Jamaican survey) is suggested for use in the Caribbean countries that do not currently possess the national household survey capability.

4.3 Designing a flexible survey instrument for the Caribbean – Considerations of Contextualisation

The Caribbean countries are characterised by diverse sizes, capabilities and outputs of their Statistical Offices. In addition, whereas most of the countries can boast of having had Statistical Offices since the pre-1950 era, some countries have Statistical Offices that were set up more recently. Another apparent differentiating characteristic is the variability of size of the offices. The net effect is that the output of the Statistical Offices is variable. The only exception to this variability of output is the result of the decennial population and housing Census. A Statistical Office with low output is not likely to receive critical support from a Government that is seeking to adjust structurally. In such a case, the poor performance of the office is likely to contribute to a lack of official support for it, and therefore

to a perpetuation of its data-poor status. The decennial Census of population and Housing is the only statistical exercise that is supported by all of the Caribbean governments. In this case, size does not matter when it comes to the content of the core questionnaire.

The core questions constitute the major part of the Census questionnaire that is common to all countries. In a similar manner, the ICT questionnaire to households and individuals is very much along the lines of a census or a survey, with limited variability regarding its content, definitions and methodology. In other words, a survey conducted satisfactorily in one country may be replicated in the other countries as long as the definitions, methodology and national preparation are satisfactory. ***The questionnaire proposed in this report is not a narrow copy of any country's questionnaire, but rather a presentation in an organised format of the questions that should be considered by the countries for inclusion in their ICT census or survey. There is a clear understanding that each country may, according to its circumstances, modify the proposed questionnaire for its own purposes, but it should maintain the concepts and definitions on which the entire data collection is grounded.***

Tables 5 through 8, which address the OSILAC Compendium of practices on the implementation of ICT questions in households and business surveys in Latin America and the Caribbean 2010, reveal the paucity of ICT datasets as held by the English-speaking Caribbean. Whereas there is awareness in the Caribbean of the need to collect ICT statistics, the corresponding registered domestic demand does not yet exist for those statistics by the administrations or by the business community. The need to prepare a Ministerial brief as a part of the present work is testimony of this fact. The stock of decennial data on ICT that may be available in Caribbean countries does not address the requirements for the measurement of the evolution in the measurement of the digital divide. The measurement of more meaningful indicators of ICT, while continuing to be an exercise in comparative statistics, will approach more closely a continuous monitoring as the survey is conducted with a known periodicity. The expectation is that the results of an ICT survey will give rise to an understanding of the demographics that may explain the degree of access and use of ICT in a given population. When viewed against the data collected from business establishments providing ICT services, fuller data on market segments and mechanisms may emerge, which may then lead to logical and consequential Government and service provider action that should result in any or all of the following:

- Lower access rates
- Greater competitive positions in all aspects of business
- A higher level of convergence among service providers
- The emergence of ICT solutions designed to meet respective national needs
- A changed relationship between the Caribbean and the originators of ICT as vended worldwide

The changed relationship referred to in the list would be the emergence of shared value and the emergence of appropriate technology use in the Caribbean and other developing countries in a manner that would reduce the digital divide through the modality of the emergence of situation-appropriate ICT solutions[4]. Advocacy is seen as a valuable modality of bringing to the Government and Private Sector the need to get on the global ICT map and appropriate the technology to the benefit of national and international development as the region's national ICT experts patent and market their derivatives to the rest of the world. **The role of advocacy as an intermediate output of the present effort cannot be minimised.**

5.0 Proposal of a Prototype Questionnaire for the "Typical" Caribbean Country

At the outset of this discussion, it is fully recognised that there is no typical Caribbean country. Each country has its own peculiarities; however, each situation tends to cluster around an average, with similar trends being identified between countries in the region. Bearing this in mind, a questionnaire

[4] Of particular interest is the discussion of shared value, such as attracting the attention of a group of researchers that includes Michael Porter and Mark Kramer. The January-February 2011 edition of Harvard Business Review is recommended reading. Porter and Kramer discuss the creation of shared value.

was designed and presented in this report, and can be utilised by the Caribbean countries that are not as well provided for as Jamaica has been.

In some respects, Jamaica is a good example, in that its degree of development and its wide-ranging activity in ICT and the supply of service providers allow it to collect an almost complete array of data. The example is not too useful if the questionnaire is transported "wholesale" to a smaller Caribbean country that is less complex, and where the service awareness and provision is just above rudimentary. There is at least one country where bandwidth is still narrow and the modal manner of connecting to the Internet is "dial-up". To this extent, deviations should be made from the comprehensive questionnaire that is used in Jamaica.

A more country-relevant questionnaire is therefore proposed in this report. Some generalised modules are being proposed, with leeway being given to the countries to introduce variations or additions to the questions as may be deemed necessary at the country level. This is similar to what is done in the Population Census, where there is a core of questions that are common to all countries. In cases where certain issues are pertinent to some countries, these may be addressed by supplementary questions. The core can easily be identified.

5.1 Recommended Questions for Inclusion in Questionnaire

SECTION A: HEAD OF HOUSEHOLD DATA

1. Sex
2. Age at last birthday
3. Religion
4. Ethnicity
5. Literacy
6. Highest level of education attained
7. Employment status (paid employee, self-employed, etc.)
8. Main occupation
9. Income (to estimate monthly or annual income)

SECTION B: FEATURES OF HOUSING

1. Ownership/tenure of dwelling unit
2. Description of dwelling unit (separate house, apartment, etc.)
3. Number of rooms
4. How many rooms are used for sleeping
5. Access to water
6. Toilet facilities

SECTION C: DATA ON HOUSEHOLD ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGIES

1. Does the dwelling unit have electricity?
2. Is there access in the dwelling to a radio?
3. Is there access to a television in the dwelling?
4. Is there access in the dwelling to a digital-ready television?
5. Does this household have a fixed line telephone at home?
6. Do you or anyone in your household have a cellular/mobile telephone?
7. Do you or anyone in your household have a computer at home, regardless of whether it is used?
8. If the answer to the above question is "Yes", what type of computer is it? (Desktop, portable, etc.)
9. Do you or anyone in your household have access to the Internet at home, regardless of whether it is used?
10. What are the reasons why members of this household do not have access to the Internet at home? (List provided)
11. What is the approximate monthly cost of your Internet access (highest in the case of multiple subscriptions)?
12. What type/s of connection/s is/are used for Internet access at your home? (list provided)
13. Why doesn't this household have high-speed broadband access? (list provided)

14. Does your narrowband Internet service satisfy your needs?
15. What would make you switch to a broadband (high-speed) Internet service?

The above shows that the core questions will not be vastly different from the questions asked in any similar survey, including what is discussed in the OSILAC documentation. The size of the recommended core will be determined by the extent to which there is a similarity of the circumstances and the abilities of the countries to identify areas that require special attention at the level of that particular country.

For example, some of the countries contain a large number of inhabitants who do not speak English. Questionnaires that are translations from the original English questionnaire will have to be prepared in other languages, thus incurring more expense in the case of countries with a rich linguistic and cultural diversity.

Taking into consideration the discussion on capacity of the NSOs, one may wish to decide on the periodicity with which the survey should be conducted.

6.0 A Design for an Annotated Household Questionnaire and a Manual

The questionnaire proposed includes explanatory notes and prompts that assist both the interviewer and the person interviewed to explain and understand the question effectively. This is different from a manual that should be produced to train the enumerators in order to ensure that they understand what is to be collected for each of the questions. The manual will discuss all aspects of the survey: from the sample design, to the training of the enumerators, to the quality control by supervisors while the survey is still in the field, and the referral of difficult cases to the supervisor(s). The manual will be produced to fit the questionnaire customised for use in a given country.

The most crucial element of the manual is the definition of specialist terms such as broadband, narrowband, bandwidth and other technical terms. The other requirement would be for the interviewer to be able to communicate with the respondent the concepts and definitions that are at the heart of the data being collected. The third aspect of the manual would be the effort to avoid non-sampling error, i.e. errors that do not arise from the manner of selection of the sample, but as the result of faulty interpretation of the meaning of the questionnaire.

The difference between a statistic and an indicator should be taken into consideration. A statistic is the number yielded through an enquiry, such as the survey conducted in Jamaica, or previous surveys that focused on some aspect of ICT provision. The primary data collected will yield data such as age, computer use or non-use and other information bits that are given by the respondent. An indicator, on the other hand, is not usually collected directly in a survey. For instance, number of cellular phones per thousand persons cannot be collected in a survey. That indicator is a derived figure that is calculated outside the survey. A number of these indicators are recommended by the statisticians working on ICT statistics under a CARICOM initiative. Recent communication with the CARICOM Secretariat indicates that CARICOM is currently refining and defining a set of indicators. The intention was to outline the detailed processes to define the indicators and to produce meta-data in the report. Subsequent to the submission of the First Draft of this report, information from the CARICOM Secretariat was made available. This report provides a definition of the ICT sector and presents a sample of indicators being developed by the Secretariat. Wholly in keeping with what this report would wish to present, the CARICOM exercise will present a list of indicators and describe how they are calculated.

6.1 Generalised Questionnaire to Households on ICT Availability and Use

The generalised household questionnaire has been conceived as being a vehicle that can be used as is or modified for use in any of the Caribbean countries. It has been designed to be a stand-alone survey, since most of the countries do not have a national household survey capability onto which a module on ICT can be attached. The questionnaire is divided into four sections, each of which contains data that can be cross-tabulated with other responses in the other sections of the questionnaire. This allows for more exhaustive analysis of the situation of the household or individual with the reality and reasons for ICT access and use. The questionnaire therefore includes questions on the characteristics of the households included in the survey. The questions asked can be used to

produce cross-tabulations with other responses on access to Information and Communication Technology as asked in subsequent sections of the questionnaire.

The questionnaire is not intended to be a strictly formal document. A formal questionnaire requires that the questions must be read out to the respondent exactly as written. Rather, the wording of the questions has been simplified in order to effectively communicate what is being asked of the respondent. Some variability in posing the question is allowed, as long as the meaning of the question is unchanged.

It is recommended that the sample should be representative of the entire population. It should therefore include the wealthy and the poorer income and society groups, so that a cross-section of users is evaluated.

The proposed questionnaire comprises of four sections that collect data on the various aspects of the questionnaire. A formatted version of the survey questions are presented at the end of this report in section 10.

6.2 The Development of ICT Indicators

The work of the CARICOM Secretariat is framed by the following strategy:

- To fully establish modern regional regulatory and open telecommunications infrastructures with affordable networks using converged technologies, in order to provide affordable and ubiquitous access.
- Build a digital community culture and increase the value and volume of the region's trained ICT workforce that can create with, develop and use ICT to improve lifestyle and otherwise add personal and economic value.
- To manage and use ICT to demonstrate good governance and increase efficiency in operations.
- To establish a culture of innovation and quality, and to enable sustainable production of regional digital goods and services, the development of cultural industries, and the inclusion of local content in the delivery of information.
- To guide businesses and governments to use ICT for sustainable growth and support social development objectives through partnerships that use networked technologies.

6.3 The Production of a Table that Explains the Derivation of the Indicators

The thinking on the part of the originators of this project is that a manual should be produced to outline the methodology used to calculate every ICT indicator that is produced. This output is not included in the deliverables of the present project, but still bears significant relevance. The CARICOM Secretariat, which has previously started discussion on the collection of ICT statistics, is entrusted with the production of the indicators that may be produced more often than once every ten years. A periodicity of once every two or three years would be more satisfactory, given the shortage of the human resources at the Statistical Offices. The statistics arm of the CARICOM Secretariat that leads the ICT initiative has reported some progress on the work of producing the list of key indicators of ICT statistics. Between the list of the key indicators produced by CARICOM and the list of indicators coming out of the surveys, a manual such as that envisaged by the originators of the present project will be produced.

A most recent update from CARICOM, while not producing a list for inclusion in the present report, speaks of work being done at the time of writing of the present report. It presents the set of indicators that the countries have submitted to that Secretariat. The list provided is to be regarded as a preliminary list. This report proposes a number of indicators in the absence of the CARICOM list. It recognises the need to update the list from time to time as more data become available. Table 5 presents the list of indicators and the methodology for their computation. This in effect incorporates the data dictionary, which is the methodological guideline to the calculation of the indicators identified at this stage.

7.0 Methodology for the Derivation of the Indicators

One of the main purposes of the proposed survey is the description of some attributes of the ICT situation in the countries surveyed. Some indicators of progress and situation have been identified by

OSILAC, CARICOM and some of the Caribbean countries. An indicator is often not a direct measure, but is essentially an indirect measure of a concept or a reality that is not capable of direct measurement in, and of itself. An indicator, as the name implies, can assist in ascertaining the direction in which a variable is moving but cannot measure the variable directly. Indicators are complex measures in that they usually represent computations involving two or more statistics. The following table, which is in essence a data dictionary of indicators, lists the statistics requirements of each indicator and describes the manner in which the indicator is computed. From the table below, it is clear that the household survey alone will not yield all of the statistics required to calculate the entire range of indicators required. The household survey effort will need to be supplemented by the survey of Service Providers (establishments) as discussed earlier, data from the decennial population and housing census, and any other data source that provides inputs into the calculation of the indicators. The tabulations from the survey responses will point to indicators that can be useful in the analysis of household use of ICT. For example, an analysis of the extent to which households interact with Government online facilities can be made by calculating a measure of such use in the indicator: *"Number of individuals who have interacted online with government organisations in the last 12 months as a percentage of the total number of Internet users"*

TABLE 5: LIST OF INDICATORS AND METHODOLOGY FOR COMPUTATION

INDICATORS	STATISTICS REQUIRED	COMPUTATION OF INDICATOR
Al Fixed telephone lines per 100 inhabitants	1. Number of fixed lines in country 2. Population count	(Number of fixed telephone lines/ Population total)* 100.
A2 Mobile cellular telephone subscriptions per 100 inhabitants	1. Number of Mobile cellular telephone subscriptions 2. Population count	(Number of Mobile cellular telephone subscriptions/Population total)*100
A3 Fixed Internet subscribers per 100 inhabitants	1. Number of fixed Internet subscribers 2. Population count	(Number of Fixed Internet subscribers/Population total)*100
A4 Fixed broadband Internet subscribers per 100 inhabitants	1. Number of fixed broadband Internet subscribers 2. Population count	(Number of fixed broadband Internet subscribers /Population total)*100
A5 Mobile broadband subscriptions per 100 inhabitants	1. Number of mobile broadband subscriptions 2. Population count	(Number of Mobile broadband subscriptions/Population total)*100
Number of households with broadband Internet access as a percentage of the total number of households	1. Total number of households 2. Estimate of number of households with broadband Internet access	(Estimate of number of households with broadband Internet access/ Total number of households)*100
A6 International Internet bandwidth per inhabitant	1. International Internet bandwidth 2. Population count	(International Internet bandwidth/ Population total)
A8 Fixed broadband Internet access tariffs per month in US$, and as a percentage of monthly per capita income	1. Fixed broadband Internet access tariffs per month in US$ 2. Monthly per capita income	(Total of annual fixed broadband Internet tariffs/12)/Annual per capita income/12)*100

A9 Mobile cellular telephone prepaid tariffs per month in US$, and as a percentage of monthly per capita income	1. Mobile cellular telephone prepaid tariffs per month in US $ 2. Monthly per capita Income	(Total of annual Mobile cellular telephone prepaid tariffs/12)/Annual per capita income/12)*100
Al0 Percentage of localities with public Internet access centres (PIACs)	1. Count of all localities 2. Count of all localities with public Internet access centres	(Total of all locations with public Internet access centres/Total of all localities with Internet access centres)*100
A11 Number of individuals who have interacted online with government organisations in the last 12 months as a percentage of the total number of Internet users	1. Number of individuals who have interacted online with government organisations in the last 12 months 2. Total number of Internet users	(Number of individuals who have interacted online with government organisations in the last 12 months/Total number of Internet users)*100

8.0 Collecting Data from the ICT Business Community

Two organisations – The Telecommunications Authority of Trinidad and Tobago (TATT) and the Eastern Caribbean Telecommunications) Authority (ECTEL) have produced data collection instruments aimed at collecting information from business establishments.

The TATT seems to be well placed to collect ICT data from providers of ICT services and from other users who are a large part of the stakeholders' body for ICT. TATT seems quite poised to collect this type of data periodically, and is therefore in a position to provide a data capture form that can, as in the case of the household survey instrument, help to shape the generalised data capture form for the Caribbean countries. A common ICT data collection vehicle aimed at businesses (ICT providers and users) for the Caribbean countries is therefore not presented in this report.

8.1 Method for Conducting the Digital Divide Survey

In order to revise the achievable objectives outlined in the Universality Framework, and to identify geographic areas (communities) that fall within the digital divide, an assessment of Trinidad and Tobago's current situation needs to be conducted. This survey will update an earlier data collection effort and point the way for the conduct of a similar survey to be done in the rest of the Caribbean. To measure this divide, TATT will be using three internationally recognised tools: the Digital Access Index (DAI), Digital Opportunity Index (DOI) and the ICT Development Index (IDI), which are defined on the following page.

- The Digital Access Index (DAI): This index is built around eight (8) indicators grouped into four (4) fundamental vectors that reflect a country's ability to access ICTs: infrastructure, affordability, knowledge and quality and actual usage of ICTs.
- The Digital Opportunity Index (DOI): This index is based on eleven (11) ICT indicators grouped into three (3) vectors: opportunity, infrastructure and utilisation.
- The ICT Development Index (IDI): This index contains twelve (12) ICT indicators, grouped into three (3) vectors: ICT access, use and skills.

The following are the individual indicators used to calculate these indices:

TABLE 6: INDICATORS FOR CALCULATING THE CRITICAL INDICES

DAI Indicators	DOI Indicators	IDI Indicators
Fixed telephone subscribers per 100 inhabitants	Proportion of Households with a fixed- line telephone	Fixed telephone lines per 100 inhabitants
Mobile subscribers per 100 inhabitants	Mobile cellular subscribers as per 100 inhabitants	Mobile cellular telephone subscriptions per 100 inhabitants
Broadband subscribers per 100 inhabitants	Broadband Internet subscribers as a percentage of total Internet subscribers	Fixed broadband Internet subscribers per 100 inhabitants
International Internet Bandwidth per capita	Mobile Tariffs as a percentage of per capita income	International Internet bandwidth (bit/s) per Internet user
	Proportion of households with Internet access	Proportion of households with Internet access at home
	Mobile Internet subscribers	Mobile broadband subscribers per 100 inhabitants
	Proportion of households with computers	Proportion of households with a computer
	Proportion of individuals using the Internet	Internet users per 100 inhabitants
Internet Access Price as a percentage of per capita income	Internet Access Tariffs as a percentage of per capita income	
Adult Literacy		Adult literacy rate
Overall School Enrollment		Secondary gross enrolment ratio
		Tertiary gross enrolment ratio

The Authority proposes the conduct of the survey to collect the primary data needed to measure the indices. Even though some of the data may be available on a national level from the service providers, primary data will need to be collected for the pre-defined areas of the country in order to measure the digital divide among communities. Up to the time of writing, a survey scheduled to have been conducted by TATT in the first quarter of 2011 has not yet been completed.

ECTEL has designed a questionnaire aimed at collecting what is most likely similar data from the Eastern Caribbean countries. As in the case of the Jamaican household survey, the ECTEL 2008 survey of the impact of telecomm liberalisation on SMEs (business establishment questionnaire) has a great appeal for the Eastern Caribbean in that the questionnaire content may track the situation in those islands more closely.

As with the Household Survey and the ability of the National Statistical Offices to conduct those surveys from the regular budget or with regular staff, the probability of any of them conducting one such survey is small.

9.0 Implementing the Project – Achieving A Country Response

The question now remains: **How can it be ensured that the survey is done by the National Statistical Offices?**

Before determining the manner in which the downstream work will be done, it would be advantageous to discuss what the survey should aim to produce. The following model is in accord with the Manual for Measuring ICT Access and Use by Households and Individuals in the Caribbean 2010 as developed by OSILAC. That manual is relevant and should, with minor modification, be

adopted. The proposed project should concern itself with every activity from questionnaire design to data collection, dissemination, the production of indicators and advocacy to policy makers. It should result in official policy review and impact the economy and society in terms of an increase in ICT use, and a resultant boost in economic growth.

The discussion of the following questions and issues will shape the response of the funding agency as it seeks to evoke action at national level:

1. Why the survey should be undertaken by the Statistical Offices
2. The present constraints to the Statistical Offices
3. The opportunity that can be presented to the Statistical Offices for them to conduct the surveys
4. The factors that can militate against the follow-through on this work.

The survey should be undertaken by the Statistical Offices because they are the best equipped to do this work. Survey taking is an area of expertise and should be undertaken by organisations with the required expertise to do so. The logistics for the mounting of such an exercise are within the competence of those offices, which is to say that they are far better equipped than any other organisation.

The Statistical Offices are under pressure to produce the work programme that they have before them. This pressure derives from a number of reasons, including the following:

1. They suffer from staff shortages. There are posts that are not filled in many of the Statistical Offices. There is therefore an undersupply of human resources at the Statistical Offices.
2. The agility of the offices to inaugurate new series for monitoring is hampered by a product orientation of the offices in which they see themselves as producing information products that seem excellent to themselves, whereas the demand for data from the offices may suggest otherwise. Therefore, there is a need for the offices to become more service-oriented and move quickly to include new datasets as the need arises. The ability to do this also depends on the availability of more staff and the organisation of the office to incorporate a special group of researchers who can inaugurate new series, put them into production, and then pass them on to be continued and maintained.
3. Under a different management orientation, the offices can become more aggressive and perform environmental scans to identify new areas of data need and produce new statistics. This is the route of portfolio development and management.
4. The budgets allocated to the offices would, however, not be adequate to support this new thrust. This constitutes a minus factor. The thrust described at point 3 above can be accomplished if there is project funding that would bring to the offices the requirements to produce the new and relevant statistics.

If the present data requirements are simply placed before the Statistical Offices, not much will ensue because of the reasons proffered above. The cause of the survey should be sold first to the governments of the region. This is what the Ministerial Brief should achieve. In addition, at the level of CARICOM, the Council of Ministers should receive a report on the outcome of the Rapid Results Initiative and be asked to endorse the work while making the recommended actions happen. The conduct of the survey should be discussed with the statisticians at one of the annual Standing Committee of Caribbean Statisticians (SCCS) meetings that are convened by the CARICOM Secretariat. This technical meeting would be the ideal forum to discuss the technical aspects of the present report. The Council of Ministers and Heads of Government of the CARICOM countries would be the forum at which national support at the highest level will be sought.

The first assistance with regard to doing the survey should take the form of a project that will be agreed to by the governments with a proviso that the project should not be considered as budgetary support, but as an action that will be taken over by government in the subsequent survey exercises required to maintain the benchmarking of the countries with the rest of the world.

The Roadshows are expected to increase the awareness of the people of the Caribbean of their position vis- à vis the rest of the world. These events should be used to create a demand that cannot go unnoticed.

10.0 The Proposed Questionnaire

	SECTION 1 – HOUSEHOLD CHARACTERISTICS	
1	How many people are there in this household? (This question is asked of the person responding to the survey interviewer. The interviewer explains what a household is.)	
2	How many children aged 15 years or younger live in this household?	
3	Does this dwelling unit have electricity or access to electricity?	Y N
4	Does this dwelling unit receive electricity directly from the Electricity Company?	Y N
5	Is there an identifiable Head of the household?	Y N
6	What is your relation to the Head of the Household? Circle the one appropriate answer number).	**01.** Head of household **02.** Spouse / Partner **03.** Child **04.** Parent **05.** Grandparent **06.** Sibling **07.** Brother / sister in law **08.** Son / daughter in law **09.** Grandchild **10.** Nephew / niece **11.** Cousin **12.** Parent in law **13.** Uncle / aunt **14.** Other (specify) **15.** No relationship
7	What is the age of the Head of the Household? Please give age at last birthday.	.....
8	What is the sex of the Head of the household?	M F
	SECTION 2 – HOUSEHOLD ACCESS TO INFORMATION AND COMMUNICATION TECHNOLOGY	
9	Do you or anyone in this household have access to a working radio at home? *(The interviewer explains what a radio is. This is contained in the Manual)*	Y N
10	Do you or any other member of his household have a television set at home?	Y N

11	Does this household have a fixed telephone (landline) at home?	Y N
12	Do you or does any member of this household have a mobile telephone?	Y N
13	Do you or does any member of this household have a computer at home, working or soon to be repaired?	Y N
14	Do you or any member of this household have access to the Internet at home, regardless of whether it is used? If "No" GO TO question 17	Y N
15	What type of Internet access services do you use at home? (Provide list) 1. Dial up 2. Broadband (DSN/DSL) 3. Broadband (satellite) 4. Cable 5. Wireless 6. Don't Know 7. Other (Please specify) _____	
16	What is the approximate monthly cost for your Internet access? …..$US……	
17	What are the reasons why members of this household do not have access to the Internet at home? Circle the number to the left of the reason listed below. 1. Access costs are too expensive 2. Not sufficiently capable to use the Internet 3. Feelings of lack of privacy when on the Internet 4. Feelings of vulnerability to malicious e-mail 5. Concern that children will be targeted by predators 6. Have no interest in going online 7. Other (Please specify)	
18	What is the estimated total income of all of the members of this household? (Please give figure in national currency)	

	SECTION 3 – INDIVIDUAL CHARACTERISTICS	
19	What are the ages of the youngest and the eldest member of this household?	☐ ☐
20	What is the gender of each person in this household (No. of males and No. of females)	Male Female
21	What is the highest level of education attained by each of the individuals above?	

22	Please describe your labour force status by ticking one of the following categories: Paid employee Self employed Unemployed	 3 1 2
23	Please give the main occupation of the Head of this household (please tick one) 1 Manager 2 Professional 3 Technician and associate professional 4 Clerical support worker 5 Service / sales worker 6 Skilled agricultural, forestry and fishery worker 7 Craft and related trades worker 8 Plant and machine operator/ assembler 9 Elementary occupation 10 Armed forces	
24	Please state the grouping that best describes the head of this household. Please circle one number from 1 to 7 as appears in the box below. 1. East Indian 2. African 3. Amerindian 4. White 5. Chinese 6. Syrian or Lebanese 7. Other (please specify)	
	SECTION 4 – INDIVIDUAL USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	
25	Has anyone in this household at any time in the last 12 months used a mobile telephone?	
26	Has anyone in this household at any time in the last 12 months used a computer from any location?	
27	Has anyone in this household used the Internet from any location in the last 12 months?	

28	If "Yes" to question 2 above, where did you or the other household members use the Internet in the last 12 months? (Please circle the number in the appropriate box below)	

1. Home	5. Community Internet access facility	9. Any place via other mobile access devices such as a laptop computer, WiFi hotspots or a laptop connected to a mobile phone network
2. Work	6. Commercial Internet access facility	
3. Place of education	7. Other locations (Please specify)	
4. Another person's home	8.Any place via mobile telephone	

29	If "No" to question 3, this is the end of the interview. Thanks for your assistance.	
30	How often did you use the Internet during the last 12 months? (Please circle the number in the appropriate box below	

1.	At least once a week but not every week
2.	Less than once a week

31	For which of the following activities did you use the Internet from any location for private purposes in the last 12 months? (Please circle the number in the appropriate box(es). 1. Getting information about goods and services 2. Getting information related to health or health services 3. Getting information from government organisations 4. Interacting with government organisations 5. Sending or receiving email 6. Telephoning over the Internet (VoIP) 7. Posting information or instant messaging 8. Purchasing or ordering goods or services 9. Internet banking 10. Education or learning activities (Formal) 11. Playing or downloading video games or computer games 12. Downloading movies, images, music, watching TV or video, or listening to radio or music 13. Downloading software 14. Reading or downloading on-line newspapers or magazines or electronic books 15. Other activities (Please specify	

Thank you for your cooperation in answering this Questionnaire.

Chapter 3: Analysis of the Policies Designed to Encourage Development of Businesses in the ICT-Services Sector

1.0 Executive Summary

This project explores the impact of Information and Communications Technology (ICT) policies on the development of the ICT services sectors of the member states of the Caribbean Telecommunications Union (CTU). The existing ICT strategy and policy documents from the member states were reviewed, and interviews were conducted in person and via telephone with government officials responsible for the development and implementation of ICT strategy and policy, ICT regulators, executives of ICT services sector firms, academics and persons involved in micro, small and medium enterprise (MSME) sector business development. The project was somewhat hampered by a lower than anticipated response rate to Requests for Information and interviews.

Review and analysis of the data collected revealed that:

- Many national ICT policy and strategy documents are either awaiting approval or lack the commitment of resources for their implementation.
- Government policies are seen as having little impact on the development of ICT services sector businesses.
- No clear links have been identified between government policies targeted at the ICT services sector and the development of businesses in the sector, outside of those businesses operating mainly in telecommunications.
- There is need for a clear focus on the developmental role of the ICT services sector, and particularly on ICT services as an economic sector.

Governance and executive leadership are critical to the success of ICT policy and strategy initiatives. The cited delays caused by changes in ministerial portfolios and distribution of responsibilities reinforce this point.

Member states lack vibrant private sector groups coordinating the development of the sector, promoting its interests or advocating on its behalf to government and other stakeholders in the society.

It is possible to develop and operate successful, world-scale ICT services businesses in the region. The study has also revealed some examples of regional ICT services entities, whose success shows that the region can produce successful ICT services businesses which have the scale and quality to compete in the international market.

The project has produced several recommendations, including:

- CTU member states must explicitly plan for the ICT services sector, including defining its developmental role, establishing targets for it, and committing resources to implement the plan.
- A regional approach should be adopted to aid the development of the ICT services sector, and therefore mitigate the effects of the small size of CTU member states, thus avoiding dissipative intra-regional competition.

Specific projects are also proposed at the regional and national levels including:

- Development and implementation of national ICT Services Sector Plans
- Develop financing plans for ICT services sector MSMEs
- Establishment of a Regional ICT Services Task Force
- Development of a Regional ICT Services Plan
- Development of Regional ICT Services Standards

2.0 ICT Services: the Opportunity

The widespread presence of ICT policies and strategies throughout the member states attests to the recognition that ICT has a substantial contribution to make to national development. This contribution is based on the important dual roles played by ICT. It is a critical determinant of the effectiveness of a very wide range of activities throughout a society. ICT is also an important economic sector in its own right. The member countries must address the challenges and opportunities of both of these roles. This will require coordinated contributions from the government, the private sector and educational institutions.

ICT as an Enabler

Countries of the region are largely consumers of technology. Therefore, they are most familiar with ICT as an enabler of organisational effectiveness. In this role, ICT provides:

- Vital infrastructure, such as telecommunications and networking
- Operational and tactical support for the organisation's business processes
- Strategic support for innovation and competitive differentiation

All of the components of the role are important if ICT is to enhance the effectiveness of business processes, providing real, effective solutions to problems and issues being faced by organisations, and enabling them to successfully pursue attractive opportunities.

A vibrant ICT services sector is a critical requirement if considerable benefits are to be secured, such as the provision of the necessary products, services and ICT-driven innovations. This is the first strategic opportunity of the ICT services sector.

ICT as an Economic Sector

ICT is also an economic sector in its own right, capable of providing employment, generating revenue and producing export earnings. Among the opportunities for this sector in member states are:

- **Provision of technical services**
  This includes system design, implementation, operation and maintenance across the wide range of ICT; application and business process outsourcing; hosting services; custom system development; training and the entire gamut of consultancy services.
- **Development and marketing of information-based services**
  The collection, management, processing, presentation and communication of information in its various forms can form the basis of a range of services, limited only by the ingenuity of the entrepreneur.
- **Development and marketing of content**
  The country and the region are blessed with cultural riches and diversity. This is but one aspect of the content that can be commercialised through the use of ICT.
- **Development and marketing of ICT and ICT-related products and devices.** The design, development and commercialisation of software is feasible and potentially attractive. This is also the case for devices that incorporate ICT. The latter consideration is an area of opportunity that has received very little attention in the region to date.

All of these opportunities can be pursued in local, regional and international markets.

Member states should seek a larger role for themselves in the knowledge economy than merely being consumers. They should seek to develop and commercialise innovations in all the sectors of their economies, and to take advantage of the tools of ICT to profit from their own ICT products, services and innovations. This project has explored how the policies and strategies of member states are equipping them to seize these opportunities offered by ICT services, and seeks to provide some guidance on the way forward.

2.1 Definition of the ICT Services Sector

The OECD [1] defines the ICT services sector as follows:

ICT Services Industries

5820 Software publishing

61 Telecommunications

6110 Wired telecommunications activities
6120 Wireless telecommunications activities
6130 Satellite telecommunications activities
6190 Other telecommunications activities

62 Computer programming, consultancy and related activities

6201 Computer programming activities
6202 Computer consultancy and computer facilities management activities
6209 Other information technology and computer service activities

631 Data processing, hosting and related activities; web portals

6311 Data processing, hosting and related activities
6312 Web portals

951 Repair of computers and communication equipment

9511 Repair of computers and peripheral equipment
9512 Repair of communication equipment

"Information Economy – Sector Definitions Based on the International Standard Industry Classification (ISIC 4)," OECD Directorate for Science, Technology and Industry, OECD 2007 [1]

CARICOM has based its definition of the ICT sector on the OECD definition and has included retail trade activities as follows:

"All technologies and products that process, transmit, and display information electronically, including that section of the content industry that is engaged in the transformation of products for electronic distribution (online or otherwise). The definition includes the manufacture of ICT goods, the delivery of ICT services, the trade in ICT goods, inclusive of the retail trade in ICT goods (that is accompanied by services incidental to the sale) and other incidental ICT enabling activities".

It is considerable that, even though it is included in CARICOM's definition of the ICT sector, the retail trade falls outside of the ICT service sector, belonging instead to what the OCED categorises as ICT trade industries.

ICT Services Sector Definition

This project focuses on those ICT services activities that can have a significant impact on development. Therefore the project has adopted the OECD classification of ICT services industries, and provides the following definition:

The ICT-Services Sector comprises those businesses which:

- Produce and market ICT and ICT-based products and services
- Use ICT to support and enhance the effectiveness of other organisations in the economy
- Develop significant ICT components and incorporate them into their product and service offerings.

It excludes those businesses which principally resell or consume ICT products and services.

2.2 Categorisation of Enterprises

There is no consensus on the definition of micro, small and medium enterprises (MSMEs). While there is agreement that MSMEs are businesses operating in the formal rather than informal sector, differences exist on how to categorise the companies by size. Categorisations have been based on numbers of employees, levels of annual sales and asset values. As there was a marked reluctance to

disclose financial information, for the purposes of this study, categorisation will be limited to the number of employees. Additionally, the precise distinctions between the categories are not particularly significant to the outcome of the study. As a result, the categorisation is as follows:

Micro Enterprise	1 – 5 employees
Small Enterprise	6 – 25 employees
Medium-sized Enterprise	25 – 50 employees

3.0 ICT Policy and Strategy Documents

The policy and strategy documents of the following member states were reviewed:

- Antigua and Barbuda
- The Bahamas
- Barbados
- Belize
- Dominica
- Grenada
- Guyana
- Jamaica
- Montserrat
- St. Kitts and Nevis
- St. Lucia
- St. Vincent and the Grenadines
- Trinidad and Tobago

A CARICOM Draft Regional ICT4D Strategy was also reviewed.

Summary of Policy and Strategy Documents

All the documents reviewed seek approaches to harness ICT for national development. There are a number of common themes in these documents, including: access to ICTs and e-inclusion, computer literacy, e-Government, and the use of ICT to support the competitiveness of SMEs. Some state the importance of developing the local ICT sector, and identify the need for ICT to support key sectors of the local economy such as agriculture and tourism. However, they do not include qualitative or quantitative goals for the ICT sector. Only one case demonstrates an attempt to establish targets for the economic contribution of ICT services beyond telecommunications; and even that case consisted only of three headings with no actual quantified targets. Also, in most cases, the resources and mechanisms for the implementation of the policies and strategies are unclear, a point that was reinforced through the interviews.

Among these common themes in the policy documents are:

Participation in the Information Society

All plans promote the idea of participation by their respective populations in the global information society. The documents focus on two required areas. Firstly, emphasis is placed on providing affordable universal access to the Internet and to ICT. Secondly, there is an emphasis on the development of the population's ICT literacy, so that the benefits of access can be accessed as widely as possible throughout the society.

This participation seeks both to further the general development of the population, and to provide a platform for national economic development in the information economy.

Telecommunication Regulation

The importance of independent telecommunication regulation is cited as a key component of several plans.

ICT in Education

The plans emphasise incorporation of ICT at all levels of the national education systems. In most cases, the focus is on use of ICT to enhance education, and on developing an appreciation of and facility with ICT tools in all aspects of their personal and work activities. There is less emphasis on education to develop the ICT sector itself.

e-Government

e-Government and the incorporation of ICT to enhance the efficiency and effectiveness and accessibility of state services is another common theme.

ICT Legislation

There is a recognisable need for legislative and regulatory frameworks to address e-commerce, cybercrime, intellectual property and related matters. These are identified as significant areas of weakness.

MSMEs

Several plans identify ICT as a tool for the development of the local MSME sector. They view MSMEs as key facilitators of national development, and seek to enhance the effectiveness and competitiveness of the MSME sector.

Local Content

Related to the emphasis on SMEs and on the local ICT sector is the need to generate local content. Among the issues mentioned here is the need to preserve the native character of the local societies and to take advantage of the international marketability of the local cultures.

Development of the Local ICT Sector

The plans seek the development of the local ICT sector to provide employment, to catalyse the ICT development of society, and as an important economic sector in its own right. However, these statements are typically very high level, with little detail.

3.1 Interviews

Interviews were conducted with persons having a range of perspectives and responsibilities relevant to ICT services. These interviews have contributed to a view of the status, challenges and opportunities of the ICT services sector.

ICT Policy

Interviews with government officials confirmed the stated emphasis of member states on access to ICT, computer literacy and use of ICT to enhance the effectiveness and provide online access to government services.

Interviewees cited challenges with the implementation of plans. In some cases, plans were not fully approved. In most cases, no implementation plan has been formulated to give effect to the ICT policies and strategies. Also, most cases demonstrated that there was not a single government minister with overall responsibility for the implementation of the plan. Responsibilities were instead distributed among two or more ministries and government agencies. It is noteworthy that the Cayman Islands cited that they have a single government minister responsible for implementation of the ICT plan, which has been critical to their success.

Another issue identified was the effect of changes of government. The incoming governments appear to have retained the existing ICT policies and strategies. However, there have been changes of personnel and changes to the structures and responsibilities of ministries and government agencies. These changes have delayed or otherwise affected the implementation of plans.

ICT Services – Disaggregated

One of the clear results of the interviews is that, among governments of the member states, there is no holistic perspective on ICT and ICT services. Instead, the view of ICT services is disaggregated into:

- Telecommunications, including mobile, Internet and cable television services
- Government IT, including e-Government, and aspects of e-Health and e-Learning
- ICT literacy
- The ICT services business

In most cases, the last of these does not feature on the agenda of government and receives little or no attention. In no case was there a government ministry or agency with responsibility for all aspects of the sector. This is unfortunate, given the pervasive convergence in ICT over the last decade, the essential interrelation of these components, and the synergies available through a holistic perspective and approach.

Insufficient Emphasis on the ICT Sector

Interviewees indicated that governments had placed little emphasis on ICT as an economic sector, and had not focused on the development of ICT businesses. They also stated that MSME development organisations placed particular emphasis on the development of ICT services businesses. The lack of attention to ICT services businesses also places an obstacle in the path of government ICT initiatives, as it is the ICT services sector which must provide the services on which the government's ICT agendas depend.

One area in which there appears to have been some success in the development of ICT services sector businesses is in the free zones in Jamaica, particularly the Montego Bay Free Zone. Anecdotal information from several sources suggests that there are a number of ICT services businesses operating successfully there, producing high quality products and services. However, it was not possible to get any detailed information, and thus further investigation into this is required.

Policy Impact

The most significant and consistently identified positive policy impacts on the ICT services sector were in the areas of telecommunications liberalisation. Interviewees cited the benefits of dramatically improved pricing, more attractive service offerings, improved service quality and supplier choice and diversity. The chief benefit they identified was the reduction in their cost of operation. This cost reduction also led more businesses to explore the use of ICT services in their business processes, expanding opportunities for the sector. Another dimension of benefit is that the reduced costs made regional businesses more price-competitive, and therefore made a wider range of business opportunities feasible. The liberalisation also made available a wider range of services such as broadband Internet and mobile Internet, which themselves are also driving business opportunities for the ICT services sector.

Another policy that was cited as having produced a benefit was the removal of customs duty on computers in some member states. Interviewees stated that this had the effect of expanding computer ownership for households and of encouraging MSMEs to invest in computerising aspects of their operation. Both of these stimulated business opportunities for ICT services sector businesses

Beyond these examples, interviewees reported minimal, nil or negative impact of policies on the development of the ICT services sector and ICT services sector businesses. One area of negative impact identified was government procurement practices, which interviewees stated disadvantaged MSMEs. They also mentioned experiences of preference being given to foreign firms over local ones. These concerns are of particular note, given the role that governments play throughout the region as major purchasers of products and services.

It must also be noted that several of the ICT policy and strategy documents reviewed were quite recent, and many were drafts undergoing approval. As a result, there would have been little opportunity for their provisions to impact the ICT services sector. Interviewees from the ICT services sector also indicated limited familiarity with the relevant ICT policy and strategy documents. This suggests that there is a need for more effective communication of these documents.

Challenges with Financing for ICT Services MSMEs

Several interviewees identified difficulties in securing financing as a challenge facing the sector, particularly the MSMEs. It was stated that the financing available for MSMEs was inadequate for businesses in the ICT services sector, and that the collateral requirements make this funding difficult to access. One interviewee's statement, which reflected the views of others, was that there was *"...no clear understanding from the governmental level or financial sector of the needs of the sector".* Among the issues raised was that, while potential lenders require collateral, in many of cases *"...the only property these persons have is intellectual".*

It was also identified that MSME development agencies had not identified the ICT services sector as one to receive special emphasis.

Interviewees involved in MSME business support indicated that they received very few proposals from businesses in the ICT services sector. There were more requests for assistance from non-ICT businesses to use ICT to improve their business processes, though these were also few.

Fiscal Services Ltd. – an ICT Success Story

Fiscal Services Limited (FSL) is a state corporation in Jamaica which provides a range of ICT services to the ministry of finance and its various revenue departments. These services include software development and implementation, hosting, infrastructure design and deployment, and application hosting. Among the systems they have developed and/or support are customs systems, payment processing systems, motor vehicle systems and tax administration systems. FSL has successfully customised and implemented its customs systems for the government of Antigua and Barbuda. Several interviewees attested to the quality of the operation and its products and services.

Employing over 150 software developers and other highly skilled ICT professionals, FSL is effectively the largest software development and application hosting company in the region. It provides positive proof that, despite being made up of small states, the region has the capacity to develop and operate innovative, world-scale ICT services companies that produce ICT products and services of international standard.

Successful ICT Strategy Implementation

The Cayman Islands offers an example of success in the implementation of ICT strategy. *"Vision 2008: The Cayman Islands Nation Strategic Plan 1999 – 2008"* was developed in 1998, and was largely implemented by the target date of 2008. It must be acknowledged that based on its size, topography, and economy, it is not typical of the CTU member states. Nevertheless, its success offers pointers for others. One of the most significant contributors to their success was governance, with a single minister of government responsible for implementing the ICT elements of the plan.

4.0 Key Findings

Many national ICT policy and strategy documents are either awaiting approval or lack the commitment of resources for their implementation.

Government policies are seen as having little impact on the development of ICT services sector businesses. No clear links have been identified between government policies targeted at the ICT services sector and the development of businesses in the sector, outside of those businesses operating mainly in telecommunications.

There is need for a clear focus on the developmental role of the ICT services sector, and particularly on ICT services as an economic sector.

Governance and executive leadership are critical to the success of ICT policy and strategy initiatives. The cited delays caused by changes in ministerial portfolios and distribution of responsibilities reinforce this point.

Member states lack vibrant private sector groups coordinating the development of the sector, promoting its interests or advocating on its behalf to government and other stakeholders in the society.

It is possible to develop and operate successful, world scale ICT services businesses in the region.

4.1 Proposals

Based on the project findings, the following proposals that seek to address the identified issues have been prepared.

Plan for the ICT Services Sector

ICT services are critical to enhancing the effectiveness and competitiveness of all sectors of the economy. The ICT services sector is also a potentially important economic sector in its own right. Securing the benefits of these twin roles of ICT services requires the development, implementation and monitoring of a plan involving the government, private sector, education and academia, and civil society.

The basis of the plan must be a clear decision of the role to be played by the ICT services sector in the overall national development agenda. This includes the establishment of performance targets for the sector. Based on this, an implementation plan must be developed to clearly identify the roles to be played by each of the key stakeholders. This implementation plan must be accompanied by the commitment of resources to implement the plan and the establishment of a governance structure which is accountable for the effective delivery to the state of the performance targets identified. A key aspect of the governance structure is that the implementation plan and the ICT services sector should be accountable to a single line minister.

Financing MSME Businesses in the ICT Sector

One of the challenges faced by ICT services sector businesses is access to financing. This appears to be the consequence of two factors. Firstly, national ICT policies have not focused on the ICT services sector. Secondly, there it appears that there is no clear appreciation of the financing needs of the MSME businesses in the ICT services sector. The first of these factors will be addressed by the ICT Services Sector Plan.

A plan must be developed to provide the businesses of the ICT service sector with the development financing required so that they can play their role in the economy. This plan must involve both the national financial sector and the national MSME business development agencies. As these businesses must play a critical role in the implementation of the national ICT plan, the minister responsible for ICT should take responsibility for the development and implementation of the financing plan.

Bringing the Sector Together

Consistently throughout this project, it has been apparent that there are no vibrant organisations that represent the interest of the businesses in the ICT services sector. This has led to a largely fragmented sector, and likely contributes to the apparent disconnect between national ICT policies and strategy and the ICT businesses.

The private sector is a critical stakeholder in the development of the ICT services sector and in securing the developmental benefits that ICT services offer. The businesses of the sector in each member state must establish an effective organisation through which they can collaborate to support the national development agenda and address relevant ICT issues. The CTU should seek to encourage the development of these national ICT organisations, as an adjunct to its ICT Roadshow initiative. Furthermore, it should seek to facilitate the collaboration of the national ICT organisations in is member states to support the regional development of the ICT services sector.

Adopting a Regional Approach

Among the major challenges faced by member states, in particular the smaller ones, are those of scale and scope. Another issue is the risk of dissipative competition among member states. The various national ICT policy and strategy documents lay the ground for this potential competition.

The region has common dependence on tourism, agriculture and cultural products; and common health care, education and other service needs. A collaborative approach to ICT support for these sectors would enable member states to overcome the constraints of scale and scope which most of them face. It would also produce common systems throughout the region, which would facilitate higher levels of regional collaboration and integration of the respective economic sectors.

If member states are to succeed in the ICT services sector, the challenges and opportunities must be approached collaboratively. Regional collaboration in ICT services must identify the following:

- Opportunities to be pursued collaboratively
- Selected opportunities to be pursued by specified member states on behalf of the whole
- Opportunities to be pursued by member states on a competitive basis
- Resources to developed and utilised regionally in support of the region's ICT agenda
- Technical standards to be used regionally to ensure interoperability of products and synergy of service and activities.

This approach is extremely challenging, given the different capabilities and capacities of member states, the different stages of development, the different developmental needs and the competing interests of member states. In addition, efforts at regional collaboration have not always yielded success. However, these challenges do not invalidate the underlying logic of the argument. Rather, they define the parameters within which a solution must be found. This will not be achieved overnight, but the benefits offered and the risks of doing otherwise make this approach imperative. The CARICOM Draft Regional Digital Development Strategy provides a framework within which ICT strategies across the region can be harmonised, and this may well represent an initial component of the collaboration.

5.0 Projects

The following projects are proposed to give effect to the proposals above:

Project	Deliverables	Duration	Prime
Develop ICT Services Sector Plan	ICT Services Sector role Implementation plan Definition of implementation structure Identification and commitment of implementation resources Definition of governance structure	6 months	Minister responsible for ICT
Implement ICT Services Sector Plan	Mobilisation of implementation resources Mobilistation of governance structure Implementation plan deliverables	Multi-phase plan with key annual deliverables	Minister responsible for ICT
Develop Financing Plan ICT Services Sector MSMEs	Plan for development financing of MSME ICT services businesses.	6 months	Minister responsible for ICT
Establish Regional ICT Services Task Force	Task Force terms of reference Identification and commissioning of Task Force members	6 months	Ministers responsible for ICT

Develop Regional ICT Services Plan	Regional ICT Services collaboration plan Implementation plan Definition of implementation structure Identification and commitment of implementation resources Definition of governance structure	12 months	Chair – Regional ICT Services Task Force
Develop Regional ICT Services Standards	Regional ICT Standards	12 months	Chair – Regional ICT Services Task Force

6.0 Bibliography

- OECD Directorate for Science, Technology and Industry, ***"Information Economy – Sector Definitions Based on the International Standard Industry Classification (ISIC 4),"*** OECD 2007

Chapter 4: Collaboration Policy for Functional Cooperation through ICT, in the Area of Crime and Security

1.0 Crime, Security and ICTs in The Caribbean: Trends and Implications

Crime and Security is a major issue at all levels: globally, regionally and nationally. A United Nations statistical report published in February 2010 shows stable or decreasing global homicide trends over the period 2003-2008 for the majority of countries surveyed in the Americas, Asia, Europe and Oceania. Disturbingly, however, exceptions to the trend include a number of Caribbean and Central/South American countries, including Belize, Honduras, Jamaica and Venezuela, which all showed significant increases in homicide rates. The types of crime and security issues now plaguing the Caribbean not only include homicides, but a wide range of organised criminal activity including trafficking in guns, drugs and persons, murders, kidnapping, burglaries and scams, cybercrime and other information security issues. Crime and security problems threaten the stability of the business environment, disrupt social order, and ultimately impact negatively on the prospects for sustainable growth, economic development and competitive engagement of these communities in the global environment.

The Declaration of Principles of the World Summit on the Information Society (WSIS) advocates the use of Information and Communication Technologies (ICTs) as tools to, inter alia, promote sustainable development and quality of life among people. Consideration on the use of ICTs to combat the serious crime and security problems represent an important area for harmonisation and collaboration amongst regional governments. Crime and security issues are borderless, and it must be recognised that as small-island developing states, these issues require cooperation in technology deployment and human capacity building in the use of ICTs and financial resources. It must also be recognised that the use of ICTs for the effective treatment of crime and security concerns does not only encompass the police or army forces, but extends to the judiciary and the court systems.

1.1 International and Regional Context

Generally, the region is a fragile and vulnerable grouping faced with a number of issues including low economic growth and declining competitiveness in traditional areas. Unemployment continues to be a problem both economically and socially, leading to rising levels of crime and outward migration to more developed countries. Economically, the region is dependent on seasonal American and European tourism, remittances from its Diaspora communities, and a diminishing stock of agricultural crops.

There are a number of common characteristics among Caribbean countries that make them particularly vulnerable to threats from crime and security. These include their small size, openness, geographic location and reliance on transnational flows. Additionally, over the years, the region has become attractive based on its known history of unpatrolled coastlines and limited law enforcement capabilities. In addition, the relative immaturity of political and social institutions has made it difficult to stem the rising tide of crime and insecurity in the region.

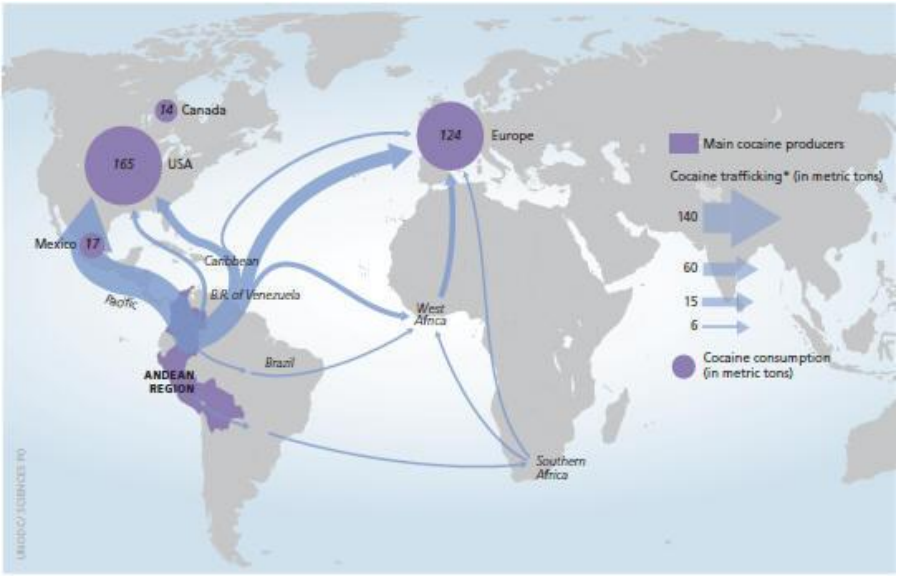


FIGURE 1: WORLD DRUG REPORT 2010: MAIN GLOBAL COCAINE FLOWS

Among the main threats to the Caribbean region are the following types of crime:

- *Organised crime*
- *Homicide*
- *Drugs and Guns*
- *Electronic Crimes*
- *Kidnappings*

Reports over the years show alarming increases in levels of crime across the Caribbean. Countries like Jamaica have notably been listed among the top countries in terms of homicide rates. Unfortunately, this situation is spreading across the region, with smaller countries such as St. Lucia now recording disquieting increases in crime levels. As illustrated in the case of firearm incidents in Bermuda, the rising crime situation affects not only the countries which are formally within the CARICOM framework, but those all over the region; therefore, any form of collaboration to counteract these issues should bear in mind these other countries. This can be observed in figure 2 below. The serious, societal and economic impact of increased crime and insecurity, both at the country and regional levels, cannot be under-emphasised. A USAID report, in relation to Jamaica in 2005, describes the potential far-reaching impact.

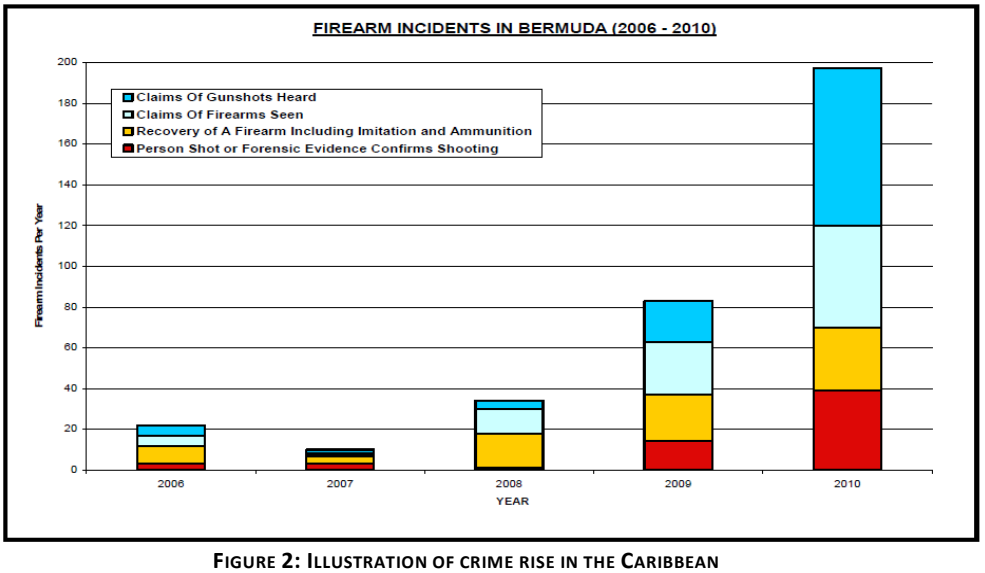


FIGURE 2: ILLUSTRATION OF CRIME RISE IN THE CARIBBEAN

These observations are applicable across the region. Furthermore in, 2010, the head of Interpol reported that recent estimates put the costs of insecurity in the Caribbean between 5-10 per cent of the aggregate regional GDP. The UNODC 2008 Annual Report suggested that a reduction in homicide rates in the Caribbean by one third could more than double regional economic growth.

Concurrent with the increasing concerns about crime and security, and amidst the decline in traditional sectors, the ICT sector has been a rising star. The liberalisation of the telecommunications sector across the region, and the growing recognition of ICTs as an industry pivotal to economic growth and development; has propelled growth rate in the sector, which has been nothing short of phenomenal. According to an ECLAC Report in 2010, of eighteen (18) Caribbean countries surveyed in March 2009, twelve (12) had fully liberalised telecommunications markets, and five (5) had liberalised some aspects of the market; while only one had a monopoly provider. With the spectacular growth experienced since 2000, many countries now enjoy over 100% mobile penetration. The mobile phone has filled the gap and in many instances replaced the use of the fixed phone, as in the case of Haiti where the ratio of mobile to fixed line is 33.7:1.

Most importantly, in the context of the current discussion, the Caribbean has become networked. The significant investments made in increasing connectivity across the region can only have positive implications. In addition to the submarine cable, which is owned by Cable and Wireless and links the region to North America through the Montego Bay Freeport, there are also the Fibralink (owned by Columbus Communications) network which connects the Americas Region Caribbean Optical Ring System (ARCOS) network in the Dominican Republic to three landing points in Jamaica; and the Trans Caribbean Cable Network 1 (TCCN1), a submarine cable established by Trans Caribbean Cable Company (TCCC) linking the United States (US), Mexico, the Caribbean and South America.

Since 2010, there has been increased activity in this area with the completion of a regional East/West Cable, which links Jamaica to the British Virgin Islands and the Dominican Republic; this was “designed to provide greater international cable resiliency” by LIME. The US$35M submerged cable aims to link Dominican Republic, Jamaica, and Virgin Islands. In 2011, the company also landed a submarine cable that links Jamaica to Cuba, as part of a partnership with ‘Telecommunicaciones Gran Caribe’ (TGC), a joint venture between Cuba (Transbit SA) and Venezuela (Telecom Venezuela). In February of 2011, it was announced that Digicel had been granted a licence to allow it to connect undersea fibre cable to neighbouring Haiti, and to the Bahamas from Jamaica. These developments will significantly impact upon the capacity of these pan-regional providers to meet the growing communication demands of the region, and hence provide a reliable base upon which to build a response to crime and insecurity in the region.

2.0 An Overview of Existing Frameworks for Functional Cooperation

Against the background of a focus on functional cooperation, crime and security is the fourth pillar of CARICOM. To this extent, a regional governance structure for cooperation has been in operation under the auspices of CARICOM, as illustrated below.

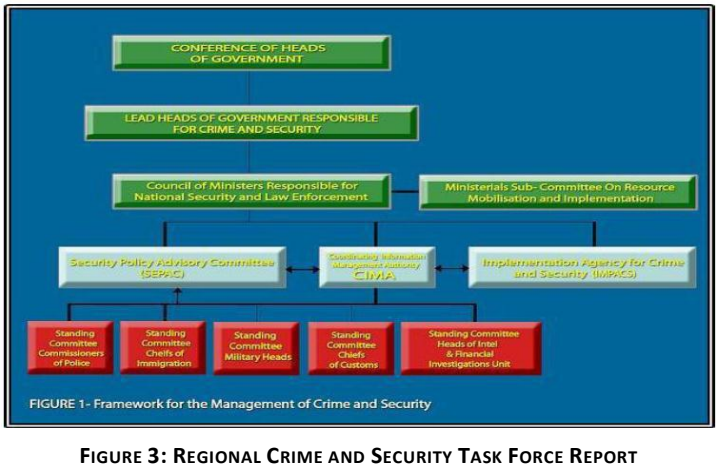


FIGURE 3: REGIONAL CRIME AND SECURITY TASK FORCE REPORT

This structure was recommended by the Task Force on Crime and Security. The Task Force recognised among other things that **"security threats, concerns and other challenges in the hemispheric context are multi-dimensional in nature and scope. It was also recognised that the traditional ways of meeting the challenges needed to be expanded to encompass new non-traditional threats, which include political, economic, social, health and environmental aspects."**

This governance structure was established to, inter alia:

- Examine the complex causes and sources of crime, especially new and emerging threats such as illicit drugs and arms and money laundering, which threaten the economic and social stability of member states.
- Explore initiatives to participate more effectively in international security, given the transnational nature of crime.
- Engage in capacity building through institutional strengthening and other forms of mutual cooperation.

Under the general CARICOM governance framework, the key councils and committees include the Council for National Security and Law Enforcement (CONSLE), the Security and Policy Advisory Committee (SEPAC) and the CARICOM Security Management Committee (CSMC). Within their jurisdiction are a number of regional institutions. Some of the main ones are as follows:

CARICOM IMPACS

Established by the 27th Meeting of the Conference of Heads of Governments in July 2006, this represents the institutional arm of the mechanisms in place to address CARICOM's action agenda on crime and security. The responsibilities of CARICOM IMPACS include research, monitoring and evaluation, analysis, preparation of background documents and reports, project development and the implementation of the regional Crime and Security agenda. CARICOM IMPACS has two main arms: The Joint Regional Communication Centre (in Barbados) and the Regional Intelligence Fusion Centre (in Trinidad and Tobago).

Regional Security System

Established in the 1980s, this is an international agreement for the defence and security of the eastern Caribbean region. In 2001, a level of cooperation was fostered with the CARICOM Regional Task Force on Crime and Security. The RSS also has bilateral agreements with the USA (2010) and Canada to provide support in combating criminal threats. The RSS is based in Barbados, and is the defence system for the Caribbean Sea to detect and combat Atlantic and intra-island drug smuggling. The RSS also provides assistance when requested as first responders in times of natural disaster.

Caribbean Customs Law Enforcement Council

Established in the 1970's, the Council is set up to enhance the ability of member countries through cooperation, sharing of best practices, human resource development, modernisation, harmonisation of processes and procedures and intelligence/information sharing.

Association of Caribbean Commissioners of Police

This is a regional organisation engaged in promoting and facilitating collaboration and cooperation in the development and implementation of policing strategies, systems and procedures, the professional and technical development of police officers and proactive measures to prevent crime and improve police community relations.

Caribbean Financial Action Task Force

Established under a Memorandum of Understanding adopting UN Convention against illicit traffic in narcotic drugs and psychotropic substances, this Task Force seeks to adopt and implement measures for the prevention and control of the laundering of proceeds of serious crime, as defined by the laws of each member state.

Based on the report of the Task Force on Functional Collaboration, this exists successfully between the various institutions and mechanisms for crime and security in the region based on

treaties and common agreements. Among these are:

1. The Treaty on Security Assistance 2006, which establishes cooperation between the RSS and CARICOM for security assistance in cases of emergency.
2. The Caribbean Treaty on Mutual Legal Assistance in Serious Criminal Matters.
3. The Memorandum of Understanding for sharing Intelligence among Member States in the Caribbean Community 2006.

International Regional and Bilateral Partners for Cooperation

Within the cooperative governance framework for crime and security in the region, a number of international organisations play an important part, influencing various aspects of the regional crime and security agenda. There are bilateral arrangements, in particular with the United States, United Kingdom and Canada, and institutions such as Interpol. Financial support has come through a number of European Union and other funded programmes (USAID, IADB etc.).

Examples of two such programmes are:

1. EU Support (400.000) to CARICOM capacity building for law enforcement agencies in the Caribbean. The objectives of this programme was to strengthen the capacity of law enforcement in the management/leadership, investigative skills, forensic awareness, financial and intelligence issues; human rights, weapons, particularly aimed at reducing the supply of drugs.
2. EU Support (800.000) to CARICOM IMPACS – Implementation Agency for Crime and Security Caribbean for institutional support to strengthen regional institutions in research and intelligence sharing to enable evidence-based policy making.

3.0 An Overview and Analysis of the Use of ICT in Crime and Security Management

The multi-dimensional nature and scope of crime in the Caribbean has led to the recognition that there is a need to expand the traditional ways to tackle ever emerging non-traditional threats. The use of ICT is slowly emerging as one response to critical issues faced in this area. As such, there are a number of ICT-enabled initiatives in place at the national and regional levels. The information and analysis in this section represents outcomes from interviews and data received from crime and security management personnel in Jamaica.

Trinidad and Tobago and Jamaica were seen to be the leaders in the use of ICTs for policing, with many other countries experiencing funding problems. The use of ICTs forms an important part of the Strategic Plan of the Jamaica Constabulary Force. In Jamaica, as a part of the thrust to modernise the force, the ICT-based systems that have been developed and are in use include:

- Automated Fingerprinting Information Systems (AFIS)
- Integrated Ballistics Information Systems (IBIS)
- Traffic Ticketing System (TTIS)
- Crime and Information Management System (CIMS), which is currently being rolled out
- Use of Geographic Information Systems

Some of these are also in use in Trinidad, and it was also reported that there are plans for these systems to be used in the smaller islands. Barbados has the capacity for DNA and Forensic Testing and there is collaboration in this area.

Therefore, at a national level, the crime and security forces have been moving toward the implementation and use of ICT technology to assist in their efforts. However, many of these ICT initiatives/projects are based on external financing and done on a country basis. There is a question/problem with regard to the sustainability of these ICT interventions/projects at the end of the funding arrangement, as national governments are often not a position to provide continued funding.

It was also perceived that access to funding for ICT interventions may be an issue, particularly for the smaller Caribbean states. This was seen as an avenue for exploration of possible economies of scale to be achieved through regional collaboration in ensuring sustainability of ICT interventions/solutions for crime and security problems.

There was reported to be a significant amount of information-sharing with respect to new technologies and efforts to use best practices; however this was mostly among the larger Caribbean

islands. Technophobia (in Jamaica) and change management issues were identified as challenges to the use of ICTs when implemented. Training was therefore identified as an important component of collaboration. Training schools are located in Jamaica, Barbados and Trinidad and Tobago. It was reported that the possibility of implementing e-Learning solutions for training is also being examined. A survey done by Dr. Marlyn Jones for the Organization of American States in 2009 showed that, while training facilities in the three jurisdictions had computer labs and Internet-ready access, not all had the capacity for e-Learning, and were at different stages of implementation.

Access to computers and network by Country	**Internet**	**Computer labs**	**e-Learning capabilities**
Barbados	√	√	In progress
Jamaica	√	√	In progress
Republic of Trinidad & Tobago	√	√	In progress

See Jones, Marlyn, http://www.oas.org/ATIP/documents/data_gathering_on_trainning.pdf

E-Learning solutions could be explored at the regional level, in collaboration with initiatives such as the Caribbean Knowledge Learning Network, UWI Open Campus and other similar programmes.

Participants in the interview process noted that the scope for application of ICT to crime and security management should be expanded to include issues of prevention and how ICTs may be used in addressing crime and security issues at this level. There are many interventions in terms of preventative measures; however, it was noted that this was not an area that attracted much regional collaboration. The possibility of using ICT as a tool to assist in prevention could be explored at the regional level. Crime and security experts in the region, as well as international organisations, have also identified the weaknesses in the criminal justice system and legislations as a challenge which requires intervention through, among other measures, the effective use of ICTs to share information across borders, monitor reform and generally increase public accountability of the justice system. The UNODC Annual Report 2008 states, “Crime thrives in institutional vacuums, flourishing where justice is weak and lawlessness and instability prevail. When countries lack strong institutions of justice — such as forceful criminal legislation, reliable law enforcement, a fair judiciary and a humane prison system — criminals find opportunities to profit.”

Research has shown modern policing to be knowledge-intensive work that requires a knowledge-based organisation. Traditionally, crime and security establishments throughout the region have operated largely bureaucratic, paper-based institutions. This has stifled the process of information sharing. It was noted that, while there was some level of bilateral sharing of information, this was predominantly with external partners. Furthermore, regional information sharing, where it existed, tended to be concentrated among the usual main players, i.e. the bigger countries and those who were more likely to be in receipt of external funding to acquire the necessary ICT systems to foster information sharing.

Work done on the incorporation of ICT systems at the national level (see Case Study of Jamaica) shows that the systems themselves, while necessary, are not sufficient to foster the efficiencies that would be required to effectively tackle crime and security issues. Translating this upward to a regional level, it must therefore be noted that functional cooperation though the use of ICTs will require much more than the implementation of ICT systems; it requires the fostering of a culture of knowledge management and the effective implementation of knowledge management processes across the region.

Generally, avenues and institutional frameworks for functional collaboration using ICTs in the area of Crime and Security do exist in the region. At the CARICOM level, there is CARICOM IMPACS, while at lower levels there are varying levels of collaboration between countries.

Some of the key stakeholders for Collaboration in Crime and Security through ICTs are shown below.

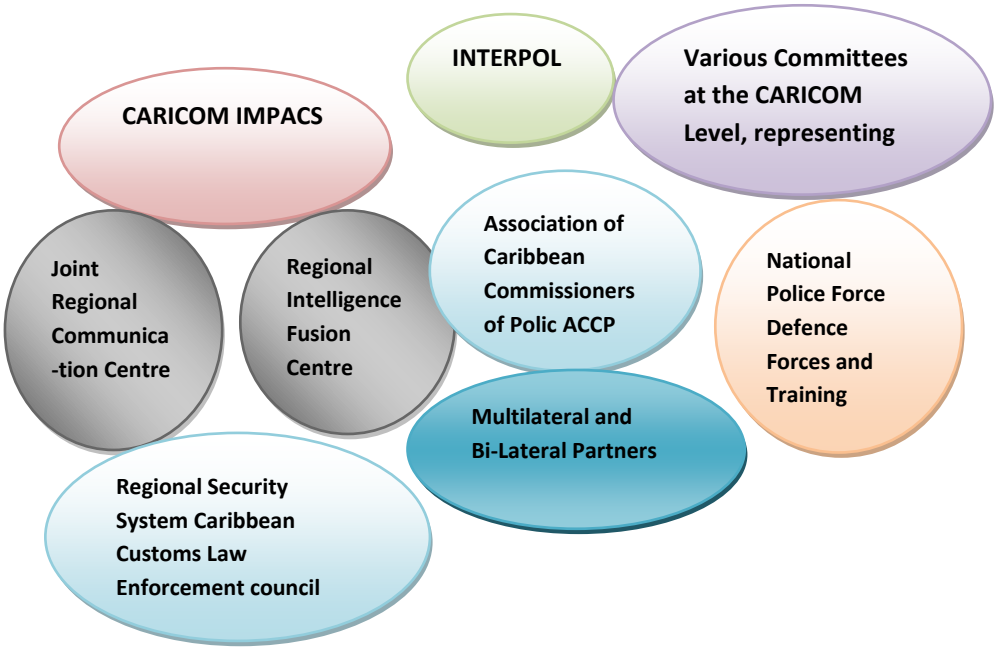


FIGURE 4: KEY REGIONAL STAKEHOLDERS FOR COLLABORATION IN CRIME AND SECURITY THROUGH ICTS

At a regional level, ICTs have been successfully used collaboratively to develop, inter alia, a CARICOM Intelligence Network, the Integrated Regional Border Control System and the Advanced Passenger Information System. These success stories corroborate the need for continued and improved collaboration in the effective use of ICTs, one of the most significant being those relating to arrangements for the World Cup Cricket in 2007. The identification of success factors and challenges experienced from the implementation of these systems should lay the basis for improved collaboration.

It was the observation of those surveyed that there was significant bilateral (country to country) collaboration with countries outside the region, such as the UK, USA and Canada. However, there exists the possibility for co-ordination in terms of how these external collaborative efforts may be more beneficial if approached from a regional point of view.

4.0 The Use of Knowledge Management Frameworks in Addressing Crime and Security

With the recognition that effective management of crime and security requires more than a traditional approach, and more than the simple implementation of technology across the world; organisations involved in crime and security are utilising knowledge management processes and systems to intensify the response to global, regional and national threats. In an Internet world where information flows at the speed of thought, the literature on knowledge management application to policing and security becomes a key determinant in an organisation's ability to meet conventional expectations for organisational viability. Failure to effectively manage organisational knowledge can quickly define a public safety organisation as inept and in need of reform (Chavez, Pendleton, Bueerman, 2005).

Knowledge management and the implementation of knowledge management systems have therefore been recognised as crucial to the effectiveness of crime and security management. A basic framework for knowledge management as presented by Abdullah, Selemat et. al. (2005) is replicated below.

1. *Acquiring Knowledge: Acquisition of knowledge in a collaboration environment which involves sequential steps that should be taken in order to make sure that the knowledge could be acquired from the right people, time and place. It is suggested as follows:*
    a. *Identify Knowledge (Determine sources and type of knowledge)*
    b. *Collect Knowledge (Gather and transform knowledge according to the specifications)*
    c. *Adapt Knowledge (Categorise the knowledge)*
    d. *Organise Knowledge (Prepare and map knowledge into the specific requirements.)*
    e. *Store Knowledge (Keep and index the knowledge dynamically)*
2. *Store: This is a process where the knowledge will be kept in repositories. These can be documents that are organised and categorised to enable browsing or fast access of knowledge.*
3. *Disseminating Knowledge: The KMS can disseminate knowledge in a collaboration environment essentially into four ways, depending on whether the communication method is synchronous or asynchronous or a combination of both.*
4. *Use: In the process of use, knowledge of how to use the KMS in a collaboration environment for specific purposes such as for problem solving, decision making and learning.*

Techniques	**Applications**	**Mode of Involvement**
Synchronous Technique (ST)	• Meeting room • Discussion • Forum	Same Time, Same Place
Asynchronous Technique (AT)	• Bulletin Board System • Notice Board • Agent Based	Different Time, Same Place
Distributed Synchronous Collaboration (DSC)	• Video conferencing • Tele-conferencing • Chatting	Same Time, Different Place
Distributed Asynchronous Collaboration (DAC)	• E-mail • Short Messaging System • Voice mail • Fax machine • Agent Based	Different Time Different Place

Gottschalk in Stewart and Mansingh (2010) proposed a model which is specifically applicable to a policing organisation. While the description below applies to a single organisation, this approach may be applicable to enhance functional cooperation across the region. The four-stage Knowledge Management Systems Model involves:

- **Stage 1 – Office to Technology**
  At this stage, individuals involved in crime and security at the national level are equipped with functioning end-user ICT tools, which would include computers and other communication devices that enhance flow of information and personal efficiency in capturing and recording data. At the regional level, it requires collaboration in ensuring that personnel and organisations throughout the region are adequately equipped with ICTs.

- **Stage 2 – Office to Officer**
  This stage involves improving the communication of knowledge throughout the organisations. According to the model, information about "who knows what" is mapped and made available throughout the organisation. This mapping of expertise takes the knowledge from the heads of a few and spreads it throughout the organisation. By extension, this expert knowledge can then be shared at a regional level.

- **Stage 3 – Officer to Information Stage**
  The information gathered at the individual and expert level is stored for mining and analysis, thus transforming the information into valuable knowledge that can be used for multimedia dissemination and policy advice.

- **Stage 4 – Officer to Application Stage**
  The knowledge captured within the information systems are used to solve problems.

The successes of using these types of models are well documented. By providing real-time, precise and concise information, and by improving the efficiency with which information is gathered, analysed and disseminated; these models can be used to enhance functional collaboration throughout the region. Using the example of Jamaica, Stewart and Mansingh provide an illustration of the various IT Systems and the knowledge management objectives that they support. Given the ever-present financial considerations, efficient methods for sharing information should enable the region to cooperate in the use of these systems where they exist, without the need for duplication across the region.

ICT Systems	Objectives of the System	Knowledge Management Stage
Databases	Information stored in general databases for general and expert access and use	Officer to Technology
TTS – Traffic Ticketing System	Tracking traffic tickets from issue to completion	Officer to Technology
CIMS – Crime Information Management Systems	A records management system which supports incidents and intelligence management	Officer to Technology

Adapted from Stewart and Mansingh (2010) Using KM to transform the JCF

Several other bodies of research provide examples of the application of knowledge management frameworks/systems to crime and security. Notably, Donalds and Osei-Bryson also use the example of Jamaica to propose a system (Criminal Investigation Knowledge Systems CRIKS) that could be used to support crime fighting in developing countries. CRIKS proposes to be able to *"aid the security forces in a number of ways: the gathering, storing and easy retrieval of information/intelligence/knowledge and reports about criminal activities obtained from members of the public and other local and overseas security forces; gathering and processing additional intelligence (from public) will improve the investigative capability of members of the security forces by enhancing their knowledge; gathering and storing the expertise and skills of both local and especially overseas officers will also improve the investigative capability of members of the security forces…."* (Donalds, Osei-Bryson).

OLD ORGANISATION + NEW TECHNOLOGY = EXPENSIVE OLD ORGANISATION

This statement was Petra Jurriens' conclusion in her 2006 presentation on Knowledge Management in the Police. Using the examples of the Police Academy of the Netherlands and the European Network, she demonstrated the importance of the application of information systems within the context of a knowledge management framework. The systems established at the national and regional levels

provided a framework whereby security personnel could learn from each other, while also encouraging costs savings through non-duplication of effort. The experience did, however, point to issues of culture and language as some of the challenges in establishing such a framework.

Considering Regional Functional Cooperation through the use of ICTs in the area of Crime and Security

Among the key issues to be considered in fostering a framework for cooperation through ICTs in the area of crime and security are:

1. The Caribbean has a very good communications network which can be leveraged to improve the functional collaboration between regional crime and security interests.
2. ICTs are not an end in themselves but tools to create the type of network capable of dealing with the globalised criminal network.
3. The need for the creation/enhancement of the current organisations' structures and processes within CARICOM towards knowledge-based organisations with the capacity for efficient management and application of knowledge-based systems.
4. Structured financing is required so that the mandate of functional cooperation (to benefit all people) can be realised.
5. Evidence-based research to promote efficiency in operations and policy-making.
6. The need for culture change and effective change management to make the required transformations.
7. Success stories within the region show the possibilities and benefits of functional cooperation through ICTs.
8. Cooperation through ICTs must extend to the judicial systems in order to be effective.
9. The region should be prepared to learn lessons from other jurisdictions, as well as coordinate in the utilisation of international resources, such as those which exist in bodies such as UNODC.
10. The implementation of knowledge management processes is essential to ensuring the optimum contribution of knowledge-based systems to ICTs in fostering regional functional cooperation.

5.0 Functional Cooperation through ICTs: The Policy Framework

The tools and potential for increased capacity presented by ICTs represent but one aspect of a comprehensive programme of functional cooperation, which is required for the harmonised transformation of the entire crime and security infrastructure. Any approach to the use of ICTs must be formulated within a policy framework, with established strategic operational and communication plans and actions for implementation, as well as monitoring and evaluation.

Policy Guideline 1

A common policy framework for tackling crime and security through ICTs must be based on a foundation of harmonisation, co-operation and co-ordination, recognising the sovereignty and diverse stages of development among the members. Furthermore, there must be incorporation of the various global, regional and national processes that impact on the development in the area of ICTs as well as crime and security. Harmonisation will be coordinated at the highest level of the CARICOM Secretariat.

Global

At the global level, the Caribbean countries are signatories to a number of protocols and agreements that impact on the focus and substance of regional and national crime, and security and ICT policies. These include:

- The UN Millennium Development Goals (MDGs), which seek to achieve social, economic and human development by the year 2015.
- The Declarations and Plan of Action of the World Summit on the Information Society, which outline the framework for the development of ICTs as a sector and its integration with other key economic and social sectors of society (such as security).

Regional

CARICOM has enunciated in various forms a connectivity agenda that establishes broad parameters, which should influence the shaping of a policy framework. The agenda calls for CARICOM countries to:

- Individually and collectively move towards expanding access to global knowledge, and full integration with the knowledge society.
- Promote the modernisation of crime and security management through ICTs.
- Seek out innovative ways of facilitating access to and usage of computers and software within crime and security environments.
- Against this background, a brief SWOT analysis of the regional situation reveals the following:

Strengths

- CARCIOM has a working institutional framework
- The Crime and Security establishment has institutional frameworks for cooperation.
- Region is well connected fibre-optic networks and advanced communication systems.
- Success story in functional cooperation using ICTs.

Weaknesses

- The ICT base for functional cooperation is generally weak within the institutions at the national levels.
- Persistence of bureaucracies
- Change management issues among leadership

Threats

- Financial challenges
- Culture
- Change management

Opportunities

- Approach will increase efficiency and response to the challenges of the international arena
- Distribution of the benefits of integration
- Economies of scale and scope

National

At the national level, the policy framework has to take account of the diverse stages of development of crime and security, as well as the ICT establishment across the countries. Some countries are far advanced along the continuum in terms of the development and use of ICT in crime and security, whilst some are still in the embryonic stages. Additionally, the areas of focus will be different for each country. The policy framework should therefore seek to promote best practices by encouraging the development of strategic plans in each jurisdiction, which will include the use of ICTs in crime and security management; thus bringing the region as a whole to a high level of efficiency in the use of ICTs to tackle crime and security.

Policy Guideline 2

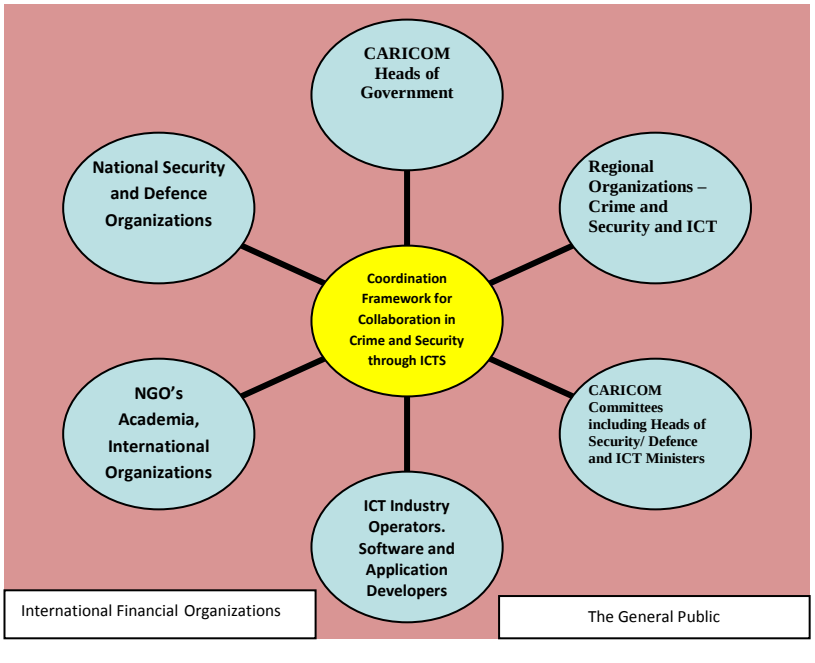
Functional collaboration through ICTS can be accomplished through existing regional institutional structures with the addition of other stakeholders such as the private sector.

Coordination will be accomplished through the basic existing structures, enhanced through capacity building and the incorporation of relevant non-industry players, including software developers. It should be noted, however, that co-ordination will not be accomplished through the typical top-down approach to policy and project development and implementation; but will require an open consultative approach will all relevant stakeholders. As such, the co-ordination strategy recognises several stakeholders:

- The Heads of Government
- Ministers with responsibility for Crime and Security
- Ministers with responsibility for ICT
- Regional and National Institutions involved in Crime and Security
- Non-Government organisations
- Industry players and Academia

The structure for co-ordination of functional cooperation could therefore be envisaged as illustrated below. The structure also recognises the need for collaboration of this framework with:

1. International organisations, especially in meeting financing requirements
2. The general public



Policy Guideline 3

Functional Collaboration from Crime and Security through ICTs to be effected through the establishment of a Knowledge Management Framework.

The underlying policy objective of achieving functional cooperation through ICT is the effective application of knowledge management systems across the four modalities of Functional Cooperation as identified by the CARICOM Draft Final Report on Functional Cooperation, which transforms the crime and security management framework into that which is necessary to deal with the issues of the 21st century.

The four modalities are:

1. Sharing Policies and Programmes
2. Dissemination of Information
3. Human Resource Development
4. Monitoring and Evaluation

Given the above, a typical organisational knowledge management framework consisting of the various technologies, how the technologies are used, and the knowledge generated by the use as illustrated can be applied to each element. Therefore, for each modality of functional collaboration, it will be necessary to determine the appropriate type of technology/application, the functions to which the technology should be applied, and the type of knowledge to be created.

Furthermore, the acquisition and implementation of systems should be done within the knowledge management framework based on models such as that established by Gottshalk, i.e. officer to officer, officer to technology, officer to information, officer to application framework. This will be useful for monitoring and evaluation purposes, and will ensure that the systems that are implemented can be matched to specific expected outcomes.

It is important to note that the implementation of knowledge-based systems at the national and regional levels should also, inter alia, take account of the cultural differences, and differing levels of development, training and change management requirements that are necessary to ensure effectiveness.

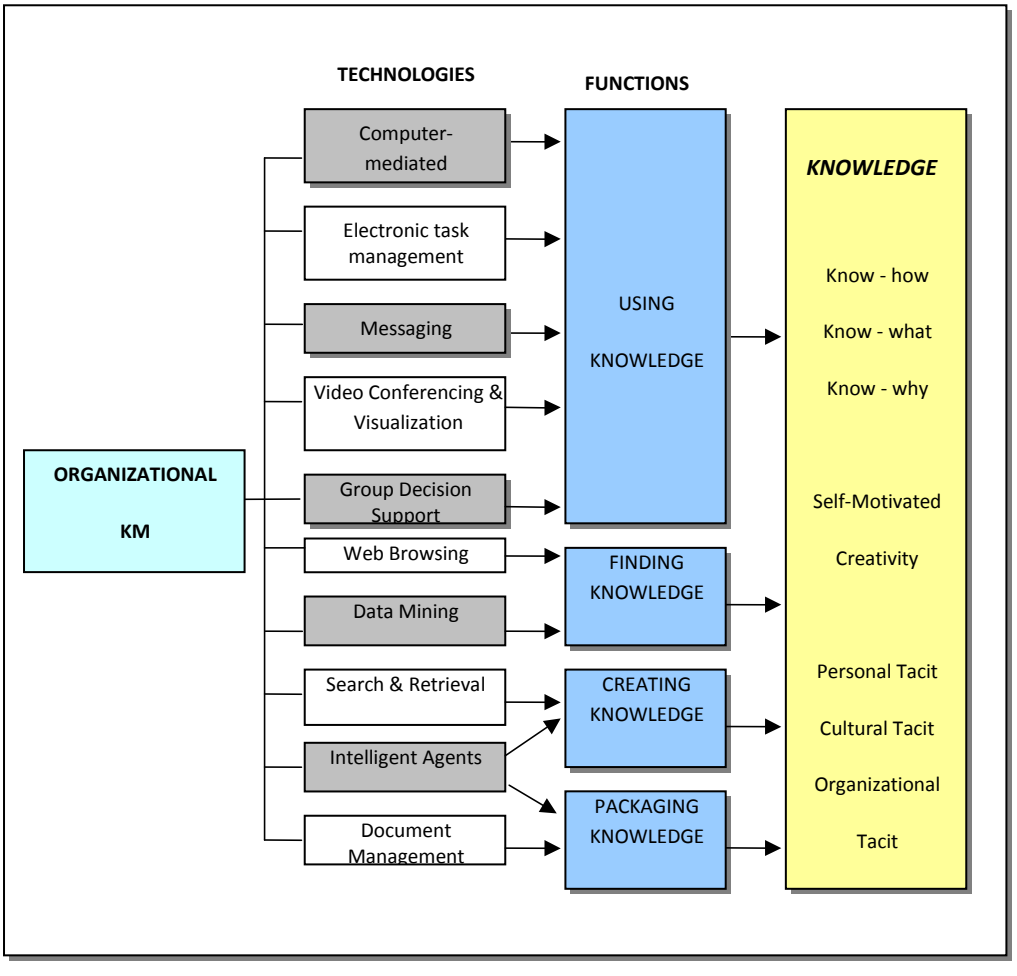


FIGURE 5: A TYPICAL ORGANISATIONAL KNOWLEDGE MANAGEMENT FRAMEWORK

Policy Guideline 4

For effective functional collaboration, ICTs (knowledge management systems) should be used to enhance, where possible, all forms of communication in regional crime and security management.

The maintenance of constant high-level contact among policy makers is essential to exchange views and information about changes across jurisdictions and to explore matters for synchronisation. Crime is a real-time phenomenon that requires real-time responses. ICTs can enable real-time dialogue, decision-making and action. **All basic forms of functional collaboration, e.g. meetings and consultations and sharing of databases, can be enhanced through ICTs.** Some of the most commonly

used functionalities which can be developed for national and region wide application are:

- Knowledge Portals: Though these portals, users can interact with data and other users in order to perform tasks. Knowledge portals would therefore represent the repository for all information related to crime and security management in the region. The Internet/Intranet plays a very important role in facilitating this type of interface between organisations and databases.
- Electronic Document Management System: As knowledge-based organisations, it will be important that the crime and security institutions be able to collate, store and enable access to important corporate information, including policies, legislations, research and other types of explicit knowledge. It is important to have a system that can manage, update, and change this type of data to ensure effective decision-making.

Other ICT systems/applications would include list-servers, shared drives, search engines, data warehousing and data mining tools, use of groupware (for sharing information and for training purposes) and technologies (agent software) that monitor addition and changes in information. These provide useful tools for effective crime and security management.

Policy Guideline 5

Strategic Areas for Functional Cooperation through ICTs

- **Policy Development and Implementation**
- **Intelligence Gathering and Sharing**
- **Efficiency in Operations**
- **Training and Capacity Building**

Four key areas can be identified for the application of a knowledge management framework and systems to achieve effective functional collaboration through ICTs. The strategic objectives are:

1. To utilise ICTs to facilitate harmonised policy, regulatory and legislative responses, which are needed to address crime and security management issues.
2. To promote the development of ICT capacities at the national level to enhance operational efficiencies and use of the regional ICT infrastructure to create linkages both within and outside of the region, thus creating a framework for cross-border intelligence gathering and sharing. A harmonised approach is required with respect to financing the development of these capabilities to take advantage of economies of scale.
3. To realise the transformation of existing institutional structures into knowledge-based learning organisations at the national and regional level. This requires implementation of knowledge-intensive management systems.
4. To encourage the use of ICTs to enhance human resource development, identify experts and to share knowledge widely throughout the region, instead of just among a few countries, for the benefit of all the people of the region.

6.0 Implementation Plan

Having identified that functional collaboration in the area of crime and security through ICTs can be achieved through a knowledge management framework, it is important to establish a plan to achieve the identified objectives. This plan recognises that there are several enabling factors for implementation.

1. Political Will

A critical element of the implementation of any regional policy is the political will and commitment of the respective Governments to the objectives of the policy. The role of Heads of Government in this case will be that of champions, providing the necessary vision and leadership in Crime and Security Management through ICTs. It is also important to note that champions are

required not only at the highest level of CARICOM and its arms, but throughout the entire establishment responsible for crime and security in the region.

2. Institutional factors

It will be imperative that the various institutional structures are functioning at the highest level with the requisite resources to engender efficiencies throughout the system. There needs to be institutional willingness to make the necessary structural changes, which will ensure the effectiveness of ICT within the crime and security management framework. This will include ensuring that the various relevant Committee and organs of CARICOM are equipped with the relevant knowledge and skills to tackle the various issues of ICT and Crime and Security.

3. Financial resources

Caribbean Governments in general face varying fiscal challenges. Given the critical lack of financial resources, the success of any implementation plan will require cooperation through pooling of domestically available funds and in accessing international funding. It will require that the planning process be closely aligned with the financial resources, not just for the initial purchase and implementation of systems, but also for maintenance and upgrading of systems and personnel.

4. Human Resources and Skills

Very critical to the successful execution of any programme involving ICTs is the ability of persons to use and apply the tools and technologies. Insufficient training can be a significant barrier to the achievement of expected outcomes. Success of the implementation plan and the policy is therefore contingent on the development of programmes for continuous learning.

The use of ICTs to enable effective functional collaboration in regional crime and security management is not a one-time event, but a process of continuous development. It is also recognised that given the level of resources as well as human resource and institutional readiness, implementation will need to be a managed phased process. Stage One will focus on laying the foundation for successful collaboration, corresponding to the strategic policy focus related to Policy Coordination and Implementation. Stage Two will focus on the other areas of strategic agenda, that is, the implementation of general and specialised systems and development of the human resources, with the context of a knowledge management framework to carry out the policy objectives. This stage will cover in an ordered manner the development of operational efficiencies in ICTs at the national and regional levels, development of the intelligence gathering and sharing competencies, as well as training and capacity building. Stage Three of the implementation plan focuses on building sustainability. This will involve putting in place programmes for continuous maintenance and upgrading of the physical infrastructure, i.e. the software, as well as the human capital and a system for monitoring, evaluation and continuous review and development of the policy to meet evolving requirements and objectives.

Three strategic programmes have been identified, which correspond to the policy guidelines and the four strategic areas for functional collaboration. The lead implementing agencies would include CARICOM IMPACS and the CTU, with other organs of CARICOM, NGOs, and private sector organisations being involved where required.

6.1 Programme 1: Strengthening the Policy and Institutional Framework

This Programme will focus the development and adoption of the overarching framework to guide the use of ICT within the crime and management infrastructure, and will concentrate on the following main areas:

1. The development and adoption of region-wide standards, procedures, and clear policy guidelines with respect to issues such as procurement, maintenance, security, and usage of ICT within the crime and security management framework.
2. The review/development/adoption of the regional legislative and regulatory framework, which will support activities such as, inter alia, information sharing, privacy and cyber security.

Relevant model policy guidelines and legislative texts have been developed through the ITU HIPCAR Project on Privacy and Data Protection, Interception of Communications, Cybercrime and Access to Information.

3. The establishment of systems and procedures for sharing information among policy makers and implementing agencies, and for the transforming of the information into knowledge which can guide future policy development.
4. The development and implementation of a communications strategy to underline the importance of the Programme and the benefits both at the national and regional levels, and to ensure continued dialogue throughout the various implementation stages.
5. The development and implementation of a Programme for continuous improvement.

It is important at this stage that Champion(s) be identified in order to get buy-in from the various stakeholders. It is envisaged that the key facilitators at this stage will be the political directorate and the higher level CARICOM Committees (both for ICT and Crime and Security). Collaboration between regional organisations such as CARICOM IMPACS, CTU and CANTO, among others is recommended to support the development of the necessary standards and procedures with respect to ICT use and implementation of the communications strategy.

Core Activities:

1. Establish a multi-sectoral Task Force with combined expertise in ICT and Crime and Security Management to undertake the following:
   a. Develop minimum in-country ICT requirements for crime and security management, using international benchmarks where available.
   b. Develop minimum regional ICT requirements for specialised ICT systems, which are necessary for regional crime and security management, and which can be strategically linked/shared among all the countries of the region.
   c. Review and develop, where necessary, relevant national and regional legislations and regulations, which would impact on the use of ICT for crime and security management.
   d. Develop guidelines, including procedures for use and access of the ICT systems, security and privacy, maintenance, business continuity and risk assessment.

2. Organise consultation workshops throughout the countries and organisations to share information on the policy vision, requirements with respect to the use of ICTs in crime and security management, draft guidelines, standards and procedures and legislative framework.

3. Prepare, disseminate and adopt final guidelines, standards and procedures for the use of ICTs for regional collaboration in crime and security.

4. Develop procedures for on-going review of policy and other relevant documentation through a consultative process.

6.2 Programme 2: Strengthening Regional ICT infrastructure for Crime and Security

A secured infrastructure is necessary for the success of any functional collaboration in the area of crime and security. This infrastructure includes the hardware, software systems and applications necessary to provide technology-based support. The type of infrastructure needed for crime and security management should be able to facilitate secure communication, the exchange of information, and the analysis and organisation of knowledge.

The two aspects of this Programme relate to:

a. Networks and Hardware

Activities:

1. Undertake a comprehensive audit of ICT systems, including end-user equipment and networks both at the national and regional levels, which includes baseline costs for managing current infrastructure.

2. Assess and strengthen the networks and hardware infrastructure (in country and regionally) through the improvement of bandwidth capacity and implementation of secure broadband Intranet and Internet networks where absent or weak.
3. Identify and address gaps in terms of access to basic ICT technologies at the national and regional levels. This would mean ensuring in-country access to basic equipment of computers, printers, scanners and other multimedia equipment; including videoconferencing, as well as reliable network servers, web servers, mail servers and information and knowledge repository servers.
4. Establish secure linkages across regional networks and with centralised offices (CARICOM IMPACS) and other specialised offices. All systems are to be protected from unauthorised use through user-IDs, password authentication and other security methods.
5. Strengthen network monitoring and security through the implementation and monitoring of rigorous security procedures by, inter alia, ensuring that technical support is in place, both nationally and regionally.

b. Software and Knowledge Management Systems (KMS)

1. Undertake a comprehensive audit of software and KMS including application software, file tracking systems, security and document management systems, along with baseline costs for managing the current set of services.
2. Systematic installing and commissioning of knowledge management systems to facilitate operational efficiencies and intelligence gathering and sharing. The specific software should link to the various stages of the knowledge management system. Among the minimum requirements would be the following:
    - Officer to Technology – Basic communication devices (phones, computers), CCTV Systems, Databases, Traffic Ticketing Systems, Crime Management Information Systems. These systems would be required at the national level to support improved operational efficiency.
    - Officer to Information – Geographic Information System, Video Identification Systems, Integrated Ballistics Information Systems. These can be strategically located to enable the sharing of information among member states of the region.
    - Officer to Officer – Virtual libraries, e-Learning facilities et al. Region-wide collaboration in the use of these systems.
    - Officer to Application – Document Management Systems, file tracking, access to international research databases. Region-wide collaboration in the use of these systems.
3. All systems to be protected from unauthorised use through User-IDs, password authentication and other security methods

In determining requirements, it should be noted that systems are in use in some jurisdictions, and thus strategies to share resources should be established to avoid unnecessary duplication.

6.3 Programme 3: Human Capital Development

The availability of competent staff to design, implement, manage and use ICT across the region is imperative and critical for functional collaboration. It is therefore necessary that special emphasis be placed on the development and retention of high-level competent ICT skill sets within the crime and security establishment, as well as ensuring training across the board for all staff through a programme of continuous development. This is required for knowledge-based transformation.

Activities:

1. Establish linkages between key institutions, such as CARICOM IMPACS, CTU, CKLN, and UWI, to develop and offer general and specialised professional training courses on ICT, covering technical, policy, regulatory and legal aspects in relation to crime and security management. This would include knowledge management, database development and maintenance, document management, archiving, use of Internet and other ICT applications, and Change Management.

2. In relation to the above, institute a "Training for Trainers" Programme, which will ensure greater opportunities for training across the islands.
3. Upgrade training facilities where required, so as to be able to offer e-Learning opportunities.
4. Develop a programme to facilitate attachments and personnel exchanges within the region and with international partners.
5. Create a centralised knowledge database which would benefit from up-to-date inputs of experts' research findings, and which can be easily and securely accessed; and establish a framework similar to the Global Regulators Exchange (GREX) to facilitate information sharing.
6. Establish processes and procedures for monitoring, evaluation and continuous development of the programme, through identification of future needs and technologies/systems that can provide high-quality learning experiences.

7.0 Bibliography

- Abdullah R. Selamat M. et.al (2005) A Framework For Knowledge Management System Implementation In Collaborative Environment For Higher Learning Institution. Journal of Knowledge Management Practice. http://www.tlainc.com/articl83.htm
- CARICOM (2002), Report on Crime and Security http://www.caricom.org/jsp/community/regional_issues/crime_and_security_task_force_report_2002.pdf
- CARICOM IMPACS http://www.caricomimpacs.org/
- CARICOM. Draft Final Report of the Task Force on Functional Collaboration. http://www.caricad.net/UserFiles/File/CARICOM%20functional_cooperation_draft_final_report.pdf
- Chavez. T., Pendleton, M & Bueerman J. (2005) Knowledge Management in Policing, US Department of Justice, Office of Community Oriented Policing Services.
- http://www.cops.usdoj.gov/files/RIC/Publications/e09050002.pdf
- Donalds, C. & Osei- Bryson (2006) Criminal Investigation Knowledge System: CRIKS
- http://origin-www.computer.org/plugins/dl/pdf/proceedings/hicss/2006/2507/07/250770155b.pdf?template=1&loginState=1&userData=anonymous-IP%253A%253AAddress%253A%2B66.54.113.88%252C%2B%255B140.98.196.192%252C%2B66.54.113.88%252C%2B127.0.0.1%255D
- European Commission Information Society and Media. (2010) ICT Research. The Policy Perspective. Freedom in Europe: Securing out Technological Future http://cordis.europa.eu/fp7/ict/security/docs/ict-results_en.pdf
- European Commission Project Report. http://www.eeas.europa.eu/la/drugs/projects_lac_en.pdf
- ISSUU. (2010) Public Safety and Security. Can ICT help? http://issuu.com/egov_magazine/docs/egov_march_2010_issue
- International Telecommunications Union. HIPCAR Project Reports. http://www.itu.int/ITU-D/Projects/ITU-EC-ACP/hipcar/documents.html.
- Jones, Marlyn Ph.D. Data Gathering on Police Officers and Civil Service Training Courses in the Caribbean Region. http://www.oas.org/ATIP/documents/data_gathering_on_trainning.pdf
- Jurriens Petra. (2006) Knowledge Management within the police. *Sharing knowledge on an international scale* Police Academyof the Netherlands,Forum European E-learning http://ute3.umh.ac.be/fee/presentations/European%20forum%20e-learning%2015%20jun06.pdf
- Police 2010 Crime Statistics Report Bermuda http://bernews.com/2011/01/police-2010-crime-statistics-report/

- Stewart and Mansingh. (2010) Using Knowledge Management to assist in the transformation of the Jamaica Constabulary Force. Proceedings of SIG GlobalDev Third Annual Workshop, Dec. 2010. http://www.globdev.org/files/Proceedings-Third%20Annual%20SIG%20Globdev%20Workshop/21-PAPER-Stewart-Using-KM-Transform-JCF.pdf
- The Economist Magazine, February 2011. Crime in the Caribbean. In the Shadow of the Gallows. http://www.economist.com/node/18114940?story_id=E1_TRTTQJQD
- The Gleaner. Various articles, Accessed from the resources of the Planning Institute of Jamaica,
- United Nations Office on Drug and Crimes, (UNODC) Annual Reports, Various years. http://www.unodc.org/
- World Bank 2007, Crime, Violence and Development. Trends, Costs and Policy Options in the Caribbean. http://siteresources.worldbank.org/INTLACREGTOPGENDER/Resources/Crimeandviolenceinthecaribbeanfullreport.pdf

Chapter 5: The Examination of Prevailing Models for the Evaluation of the Impact of ICT on Development within the Caribbean

1.0 Project Overview

1.1 Research Problem and Rationale

Over the past decade, public and private sectors in the Caribbean have employed more modern, and in particular more web-based, Information and Communication Technologies (ICT) at increasing rates. The primary aim is often to increase operational efficiencies that support public service reform, enhance citizen engagement, and promote social and economic development. The country plans or national strategies of many Caribbean islands and territories now emphasise economic diversification. As a result, predominantly mono-economies that focused primarily on agriculture and/or tourism are expanding to include ICTs to enable sustainable socio-economic growth and development.

To date, however, little if any documented evidence of the impact of ICT investments on development in the Caribbean is known. The literature documents a number of ICT impact assessment models, from which only one model seemed somewhat related to the Caribbean: "True stories: Telecentres in Latin America & the Caribbean" (Hunt, 2001), which focused on the assessment of Telecentres in Ecuador.

However, Ecuador is just one of the many countries of Latin America and the Caribbean region, and can more adequately speak to the Latin American, but not necessarily the Caribbean experience. Moreover, in a recent report, "Impact Assessment of ICT-for-Development Projects: *A Compendium of Approaches,"* Heeks and Molla (2009) present an analysis of ICT impact assessment models, which included the Ecuadorian study by Hunt (2001). They reported that Hunt's (2001) method was "very brief" and commented further as follows: "No framework – just asked those involved (staff at 28 LAC Telecentre projects) to respond on: set-up/resources; social role; main problems and solutions; obstacles; enabling factors; results". Despite Heeks and Molla's (2009) criticism, Hunt's (2001) effort is to be applauded because his is possibly one of the few reports that mention the word Caribbean. However, if efforts are to be truly representative of Latin America *and* the Caribbean, his effort needs to be supplemented by more careful investigations that represent the realities of not just Latin America, but also the Caribbean.

With the increasing investment in ICT, it is critical to ensure that the return on investment is secure and seen in national developments, and more equitably so. To this end, stakeholders need to adequately assess the impact of ICT investments using appropriate models. To contribute to a better understanding of the impact of ICT investments in the Caribbean, an examination was conducted of Prevailing Models for the Evaluation of the Impact of Information and Communication Technologies (ICT) on Development in the Caribbean. The investigation specifically aimed to identify the best practices of accessible ICT impact assessment through a review of secondary data, and the generation of primary data. The former resulted from review of journal articles, some of which were peer-reviewed; in addition to working papers, others papers from conferences, project management texts, budget estimates, budget speeches, and national ICT and other plans. The latter was garnered through relevant local knowledge contributed by ICT stakeholders in government, industry, and academia. Together, these informed a utility model for the assessment of the impact of ICT on development in the Caribbean, one of the central contributions of this investigation. The following are the more detailed aims and objectives of the project.

1.2 Research Aims and Objectives

The general aim of this research project was to contribute an appropriate model to evaluate ICT for development initiatives in the Caribbean, raise awareness of the imperative of assessment and research in the Caribbean, and inform ICT initiatives at all levels.

The following are the specific objectives of the research:

- Review relevant literature and prior research on ICT impact assessment.
- Contribute to the comparative literature on ICT impact assessment.
- Help inform the ICT-related activities of local public and private sector stakeholders of CARICOM member states, particularly government employees, business persons, students and other young persons, and others who engage in and/or promote ICT development in the various CARICOM member states.
- Help inform the ICT-related policies and initiatives of government and non-governmental bodies of CARICOM such as the Caribbean Telecommunication Union (CTU) and Caribbean Centre for Development Administration (CARICAD), international agencies such as International Telecommunication Union (ITU) and United Nations Department of Economic and Social Affairs (UNDESA), and others who engage in and/or promote ICT development regionally and internationally.

1.3 Method

To conduct the examination of prevailing models for the evaluation of the impact of Information and Communication Technologies (ICT) on development in the Caribbean, the project researcher employed a mixed-method approach. This approach, which comprised of quantitative (document analysis and survey) and qualitative (quick ethnography) elements, enabled a more comprehensive understanding of the issues under investigation to acquire data from selected existing documents and relevant stakeholders in the Caribbean region.

Population and Sample

The population targeted for this study were the English-Speaking CARICOM members. To date, there are fifteen (15) members and five (5) associate members of CARICOM. The focus on these island and territories was a specific mandate of the Caribbean Telecommunication Union (CTU), who commissioned this research. The CARICOM members and associate members are all contributing members of the CTU, the telecommunications unit seeking to serve the needs of the members through Rapid Response Initiatives.

These members were ideally suited to contribute to an examination of prevailing models for the evaluation of the impact of Information and Communication Technologies (ICT) on Development in the Caribbean. They are the ones affected by the outcomes of ICT initiatives and can, therefore, most appropriately discuss the impact or lack thereof on their individual and collective developments. They are also some of the many islands that are often neglected in the relevant comparative literature. As discussed earlier, Ecuador is documented as the closest territory to the Caribbean that has been involved in ICT impact assessments. By giving voice to the perspectives of the Caribbean Community, the investigation is contributing awareness of their specific experiences and providing an added comparative scope to the literature.

Documents from all of the CARICOM member and associate member states identified above were collected as far as possible for analysis. These included National Strategies, National ICT strategies and National Budgets assisted in identifying national priorities regarding ICT investment. In addition, key ICT stakeholders such as Directors of Information Technology, Policy Advisors, ICT Development Coordinators, Senior Telecommunications personnel and Information Technology Administrators, among others of the various CARICOM member states; were invited to share about the current status of ICT initiatives and impact assessment, and the best national, regional, and international practices that can be adopted to appropriately assess the impact of ICT initiatives in the Caribbean.

Instrumentation

The instruments used in the study included a document review checklist, survey questionnaires, and an interview schedule. Given the short project time frame, these were determined to be the most effective to allow for a participatory element to the research effort.

The document review checklist analysis garnered relevant information, from that already present in the literature, to help identify the prevailing ICT issues related to impact and assessment. The trends from this secondary data informed the design of a questionnaire that was used for the online survey, and an interview schedule that guided semi-structured telephone and face-to-face interviews with select stakeholders. The two latter instruments garnered data that was not accessible from the document analysis. This included more focused data regarding relevant details on ICT projects implemented during the period 2001 to 2010, the impact on the organisation and general public, and how such impacts were measured. The interviews focused on acquiring specific data that the questionnaire could not provide, such as stakeholder perceptions regarding ICT impact practices and recommendations.

The document review checklist comprised of fifty (50) items that focused on ICT assessment approaches, project management methodology, and regional ICT initiatives. The questionnaire consisted of thirty-four (34) items, which focused in particular on the perceived impact of ICT initiatives on the organisation and the general public, and the value and sector of ICT investments over the period 2001 to 2010. The interview schedule was made up of five (5) open-ended questions that sought data on ICT projects implemented and assessment approaches.

Procedures

The research was designed to analyse relevant (1) documents related ICT to identify impact assessment models, and (2) perceptions of relevant ICT stakeholders in the Caribbean region about projects implemented during the period 2001 to 2010, the impact on the organisation and general public, and how such impacts were measured. For the former, particular attention was paid to models used to assess impact in the Caribbean and the suitability of these models. However, in the absence of all but one accessible model, attention was focused primarily on extra-regional models from North American and European societies, which dominate the literature. Together, these two major information sources helped contribute a comprehensive understanding of the status and impact of ICT investments regionally and globally. More importantly, this approach helped identify best practices nationally, regionally, and internationally that informed the model proposed for assessing the impact of ICT in the Caribbean Community. The following are the steps undertaken in conducting the project.

2.0 Presentation of Data

This section presents the data gathered using the document review checklist, survey questionnaire, and interview. The section is divided into two parts. The first comprises of a presentation and the data from the secondary sources. The second consists of the data from the questionnaire and interviews. The section ends with a brief overview of the data, which provides the groundwork for the discussion of data in Part III.

2.1 Summary of reviewed ICT impact assessment models in Literature

The secondary data was garnered from journal articles, working papers, conferences, project management texts, budget estimates, budget speeches, national plans and national ICT plans. The review of these sources yielded significant relevant data. The literature shows there are a number of attempts to determine how influential ICT interventions have been. Journal articles mainly yielded information about models, and the other documents provided information regarding regional and national ICT project initiatives.

The review generally concentrated on five (5) main criterions: article focus and method, assessment approach of model, assessment stage of model, citizen-centeredness of model, and transferability (the appropriate elements that can be adopted). These specific document review criteria were selected in support of the research questions. Each criterion is explained below.

Article focus and method

Generally, the journal articles reported (1) the results of using an existing assessment model to evaluate a particular ICT project, (2) a new model that was actually used to assess an initiative or that is proposed for the assessment of an ICT initiative, and (3) the critique of assessment models that authors did not personally utilise to evaluate an initiative. Some reports recommended how models can be amended to achieve assessment of particular projects.

Assessment approach of model

The review also indicated that the major assessment models/approaches are, as Heeks and Molla (2009, p 6) describes them: (1) "Sector-specific" (e.g. Health, Education, National Security), (2) "Application-specific" (e.g. Hospital Information Systems, Crime Information Systems), (3) "Issue-specific" (e.g. Diabetes Database), (4) "Method-specific" (e.g. Participatory and non-participatory ethnography, Survey), or (5) "Generic" (Designed to assess any project). Also, different models emphasised different assessment areas such as value (determining whether the return on investment was achieved).

Assessment stage of model

The review also attempted to categorise each model reviewed to reflect, as Heeks and Molla (2009, p 4) describes, the four (4) stages of the ICT for Development value chain. These four stages are (1) Readiness, which assesses the awareness of the initiative (2) Availability, which determines the supply and maturity of the particular initiative, (3) Uptake, which determines the demand and usage of the initiative and (4) Impact, which determines the efficiency and effectiveness of the initiative.

Citizen–Centred Model

The review sought to determine whether the perspectives of ordinary public citizens were incorporated in the assessment process, or if they participated in other ways.

Transferability

The review also sought to extract the positive attributes that can be applied in the region.
Table 1 provides a summary of seven (7) articles that epitomise the approaches documented in the literature.

TABLE 1: SUMMARY OF SELECTED ICT IMPACT ASSESSMENT MODELS

No.	Article focus and method	Assessment approach	Citizen Centric	Assessment stage	Methodology Summary	Transferability
1	**The Ashraf et al (2008) model** Proposed approach to determine the impact at the community level, of a Telecaster project implemented in a Bangladesh	Application Specific	Yes	Impact	Qualitative study 3 months field research. Secondary research of project reports. Interviewed employees and community members.	**Strength** Provides citizen perspective **Weakness** Relies on the existence of proper reporting by the Telecentre management
2	**The Wang et al (2005) model** Theory -based model designed to evaluate the performance of web-based e-Government services	Generic	Yes	Uptake and/or Impact	Qualitative study	**Strength** Provides citizen Perspective **Weakness** No clear test of model

3	**The Alshawi and Alahmary (2007) model** Proposed method for the evaluation of web-based e-Government services using seven (7) evaluation factors	Issue Specific	Yes	Accessibility Uptake Impact	Evaluates performance of web-based interventions based on an accumulative rating of: Performance Accessibility Cost saving Openness Trust Perceived ease of use Perceived usefulness	**Strength** Incorporates some socioeconomic Factors **Weakness** Weighted heavily towards web-based interventions
4	**The Adam and Wood (1999) model** A grounded theory approach that focuses on user perceptions	Application Specific	Yes	Uptake Impact	Qualitative Study 2 rounds of fieldwork, each 4-month stints Theoretical sampling Interviewed local ICT users and opportunity informants from other African countries Transcribed data was analysed using the comparative analysis method Impact explanation categorised in four classes: 1. Actual Impact 2. Potential impact 3. Constraints 4. Actions centred on users and their reactions	**Strength** Theory-based Cast a wide stakeholder net Views ICT Impact assessment as social science **Weakness** Focus primarily on ICT application interventions in business and government

5	**The Singh et al (2002) model** An explanatory approach to determine the diffusion of e-Government services from the citizens' perspective	Issue Specific	Yes	Uptake	Quantitative Study Survey method Hard copies of questionnaires randomly distributed to be collected at a later date	**Strength** Anonymous questionnaire method Can obtain a high volume of responses quickly **Weakness** Does not address impact
6	**The Esteves and Joseph (2007) model** A value-driven assessment approach that aims to determine the worth and utility of e-Government interventions	Method Specific	Yes	Uptake Impact	No methodology presented Outlines a tri-dimensional approach that examines the following areas: 1. E-Government Maturity 2. Assessments 3. Stakeholders	**Strength** Cast a wide stakeholder net **Weakness** No methodology presented No clear test of framework
7	**The Gross Social Feel-good (GSF) Index** An index proposed by Tsuda et al (2007) for evaluating the contribution of ICT services to the realisation of a sustainability society.	Generic Specific	Yes	Impact	No methodology presented Includes six sub-indexes to evaluate impact: 1. Environment 2. Safety 3. Health 4.Comfort 5. Economy 6. Happiness	**Strength** Includes a happiness index that indicates persons feelings and/or satisfaction regarding ICT services **Weakness** No methodology presented No clear test of framework

3.0 Major Themes

3.1 Primary Data

The primary data was garnered using a survey questionnaire and interview schedule. Key ICT stakeholders such as Directors of Information Technology, Policy Advisors, ICT Development Coordinators, and Information Technology Administrators were invited to respond to an online survey questionnaire. In total, fifty (50) invitations were sent via email, of which nine (9) were completed and reviewed. Forty (40) invitations for telephone interviews were solicited from ICT stakeholders from government and industry sectors in the 15 countries. Six (6) responded to requests and were interviewed.

Due to the very low questionnaire response, additional requests to complete the questionnaire were sent to multiple stakeholders per member state, with the exception of Haiti.

3.1.1 Stakeholders' Responses

This section summarises the key themes that emerged from the data garnered via survey and interviews with key respondents throughout the region. A total of 50 persons, representing 15

countries, were solicited to provide information for review. They were asked a series of questions about:

- The ICT initiatives undertaken by their organisations during the period 2001 to 2010
- The alignment of their ICT strategy to their overall strategic priorities
- How they measured the performance of their ICT investments
- Impact assessment strategies
- How they measured their organisation's capability to commission, manage and deliver ICT-enabled programs
- Their risk management strategies
- Details of best practices that could be shared
- Their views on existing whole-of-government ICT governance structure.

A total of nine (9) questionnaire responses have been received and reviewed. Six (6) telephone interviews and five (5) face-to-face interviews have been conducted.

3.1.2 ICT Investment Decision Making

Prioritising investments

Approximately 56% of respondents noted the existence of a moderately formal process for prioritising ICT investment at the agency/organisational level. Approximately 33% indicated a more formal process. The remaining 11% reported a less formal prioritisation process. However, additional research is needed to detail these prioritisation techniques or extensive assessment criteria to rank competing investments.

Alignment of ICT investments with strategic priorities

The review observed that there are some structures in place for whole-of-government priority setting for ICT investment across government portfolios. Furthermore, there are few avenues by which agencies can obtain information on ICT activities in other agencies before investing in ICT. It was also reported that local technical capacity of the ICT portfolio agencies or ministries are very much overburdened.

Future importance of ICT to government business

Across the board, respondents reported that ICT is a fundamental enabler and an integral part of their operations. There was also a unanimous view that ICT will continue to increase in importance. In particular, respondents commented on the increasing need for more robust and agile systems to:

- Enhance public service delivery
- Meet rising expectations from citizens and government
- Improve operational efficiency
- Manage increased complexity in the regulatory, business and policy environments.

3.1.3 Project delivery

There are several review mechanisms that examine and report on the delivery of major government investment projects and programs, including ICT-enabled projects. These are primarily national mid-term reviews and project reviews by funding agencies. These project reviews aim to improve the likelihood of successful delivery, while ensuring stated project goals and objectives are realised.

Use of project management frameworks

Approximately 50% of respondents reported the use of a formal project management methodology to manage ICT projects. Respondents commented on the use of established project management methodologies such the PRINCE2 methodology or the Project Management Body of Knowledge methodology or a hybrid of both methodologies.

Use of governance mechanisms

Three respondents cited their involvement in a whole-of-government ICT governance mechanism for project delivery, while two other respondents noted the use of internal project boards.

Risk management

Three respondents did not respond to this question. One respondent noted, “We do not have a formal risk management process”, while another commented, “Internal assessment”. Two respondents described their risk management process in some detail. For example, one respondent noted that:

“The Ministry of Health basically takes three criteria into consideration when dealing with any risk management process:

1) Threats - we look at all threats that could impact ICT, for example viruses

2) Vulnerabilities - we then examine our systems and look for areas where the threats could be realised.

3 Impact - we then ascertain the impact on costs that the Ministry will suffer if the threat is realised. Our plan is to then minimise the vulnerabilities so that the threats are not realised."

Evidence from recent ICT projects

Respondents were asked to provide details of 5 to 10 major ICT-enabled projects and how they measured their success in terms of cost, time, specification and delivery of anticipated benefits. Feedback on approximately 20 projects was received.

3.1.4 People

Three respondents commented on the adverse impact of ICT skills shortages. There is general agreement among these agencies that ICT skills shortages are widespread, and that the government’s ability to attract and retain highly skilled and motivated people has a significant impact on both efficiency and effectiveness; although two respondents observed that they are not experiencing current pressure from shortages. Respondents noted a mix of solutions to cope with skills shortages. These include:

- Partnering with private sector organisations to deliver projects.
- Education and graduate recruitment, including partnering with tertiary institutions, running traineeship programs, and supporting apprenticeships.

Measures of efficiency

Very few respondents noted that they used metrics to assess the efficiency of their ICT spend. Only two respondents regularly reported efficiency metrics and targets to their senior executive.

Measures of effectiveness

Two respondents reported that they employ metrics to manage the effectiveness of their ICT operation, such as availability, outage reporting, number of client application service requests completed, and customer satisfaction surveys.

Measures of impact

On average, 68% of respondents indicated that the ICT projects reported achieved a positive impact at the organisational level. Approximately 40% of respondents were undecided as to the impact on the public, with approximately 11% noting that there was no impact on the public.

3.2 Questionnaire Key Highlights

This section highlights the feedback from nine (9) respondents of six (6) questions posed via the online questionnaire. The responses are represented graphically below.

3.2.1 Question 10

Based on respondent feedback to question 10, the majority of ICT initiatives implemented during the period 2001 to 2005 were deployed in support of infrastructure development, online services, health and human resource. This is illustrated in Figure 1 below.

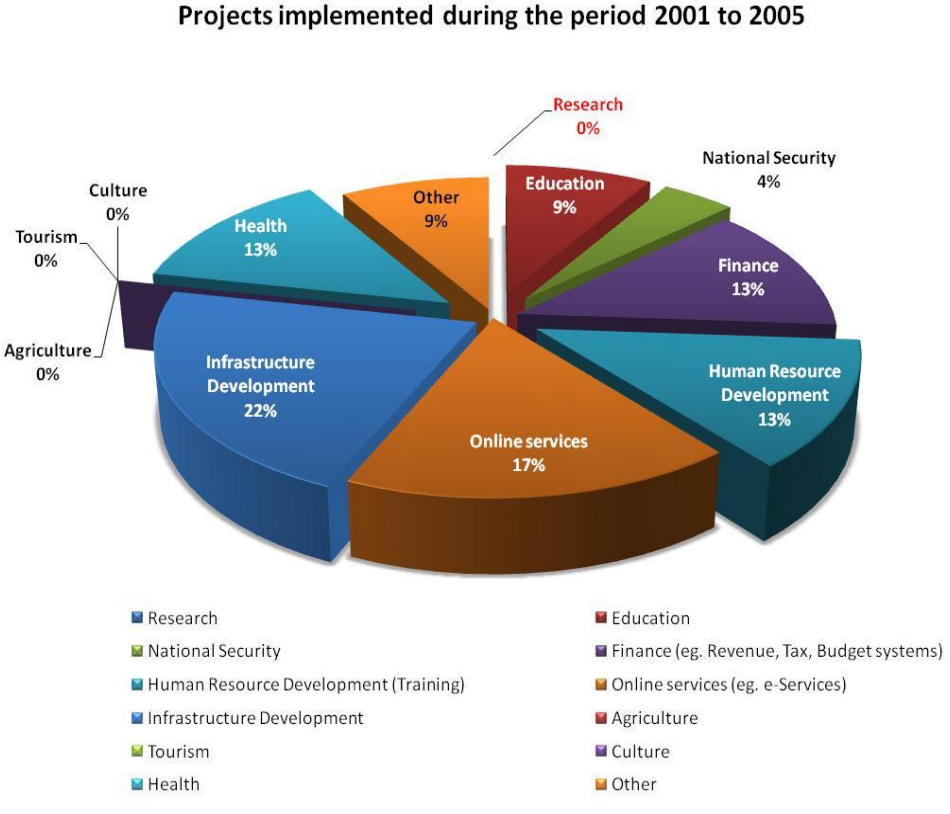


FIGURE 1: PROJECTS IMPLEMENTED DURING THE PERIOD 2001 TO 2005

3.2.2 Question 11

Based on respondent feedback to question 11, approximately 34% of ICT interventions implemented during the period 2001 to 2005 were valued between EC$1m to EC$5m. Approximately 33% of reported ICT interventions during the same period were valued over EC$5m. This is illustrated in Figure 2 below.

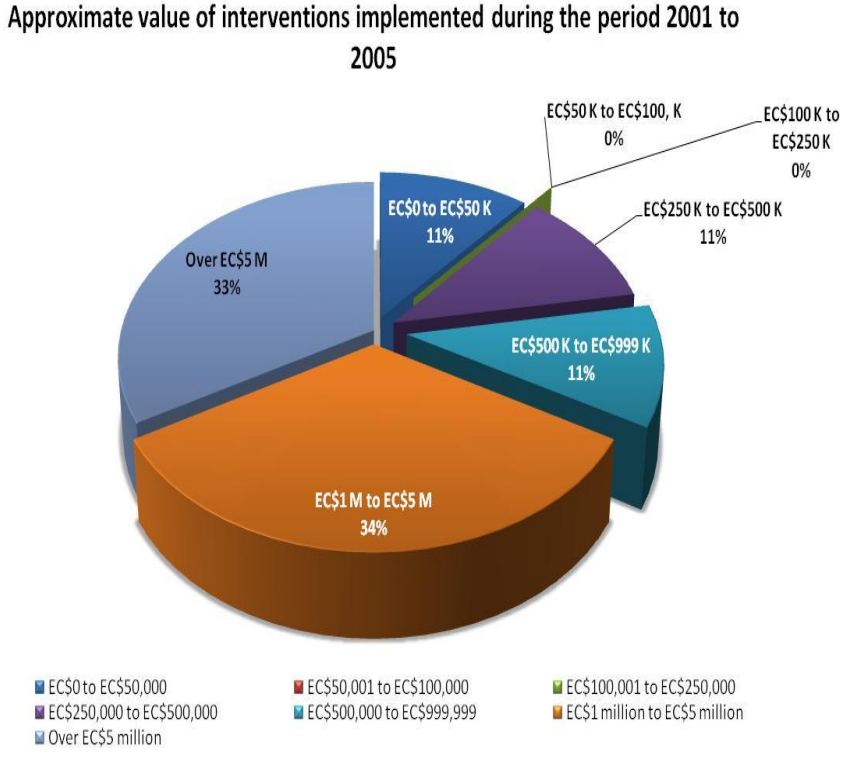


Figure 2: Approximate value of ICT initiatives implemented during the period 2001-2005

3.2.3 Question 13

Based on respondent feedback to question 13, the majority of national ICT interventions were deployed in support of infrastructure development, online services, health, and human resource development. This is illustrated in Figure 3 below.

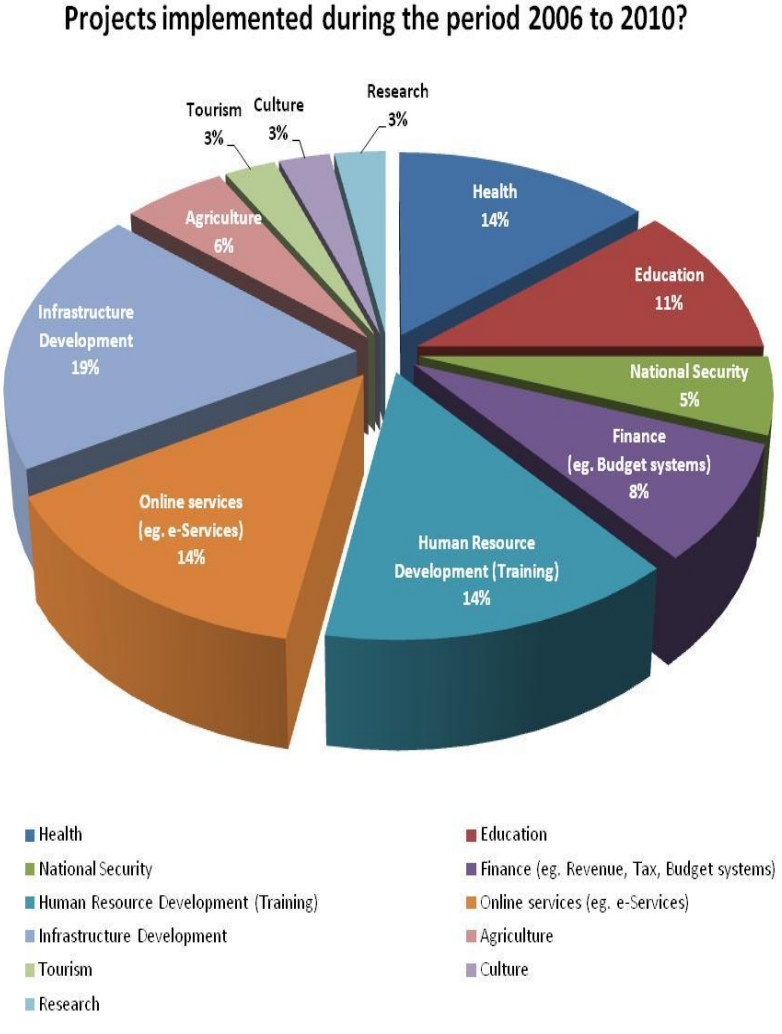


FIGURE 3: PROJECTS IMPLEMENTED DURING THE PERIOD 2006 TO 2010

3.2.4 Question 14

Based on respondent feedback to question 14, over 60% of reported ICT interventions during the period 2006 to 2010 were valued over EC$5 M. This is illustrated in Figure 4 below.

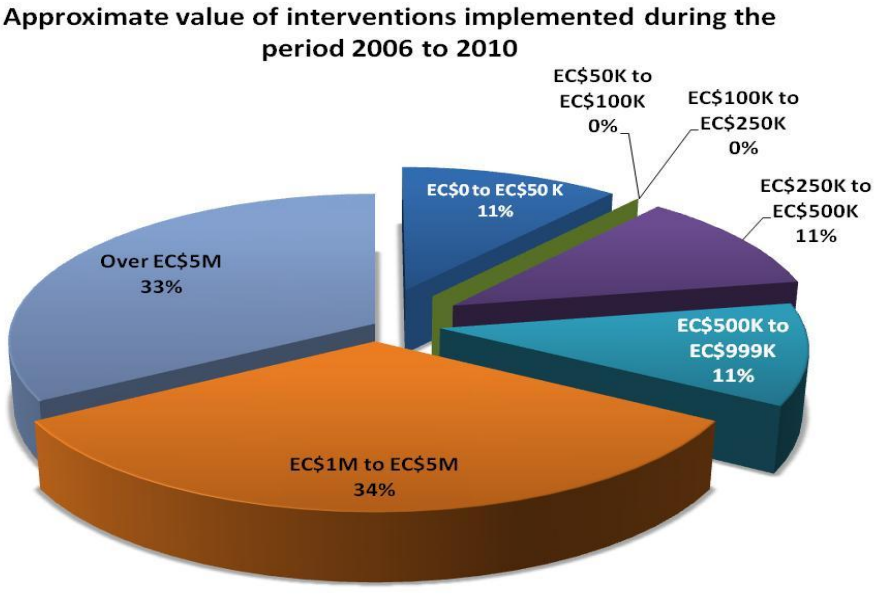


FIGURE 4: APPROXIMATE VALUE OF ICT INITIATIVES IMPLEMENTED DURING THE PERIOD 2006 TO 2010

3.2.5 Question 15

Based on respondent feedback to question 15, over 50% of ICT interventions are not formally assessed; however, the remaining 50% are accessed via a combination of qualitative and quantitative methods. This is illustrated in Figure 5 below.

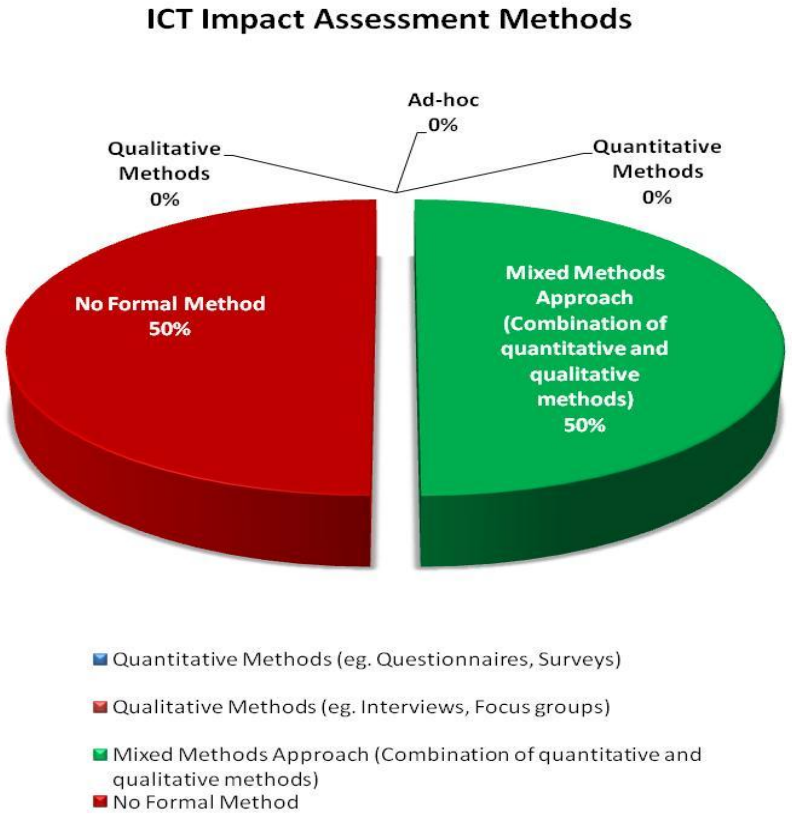


Figure 5: Impact Assessment Methods Used

3.2.6 Question 17

Based on respondent feedback to question 17, approximately 35% of ICT interventions are government-funded. This is illustrated in Figure 6 below.

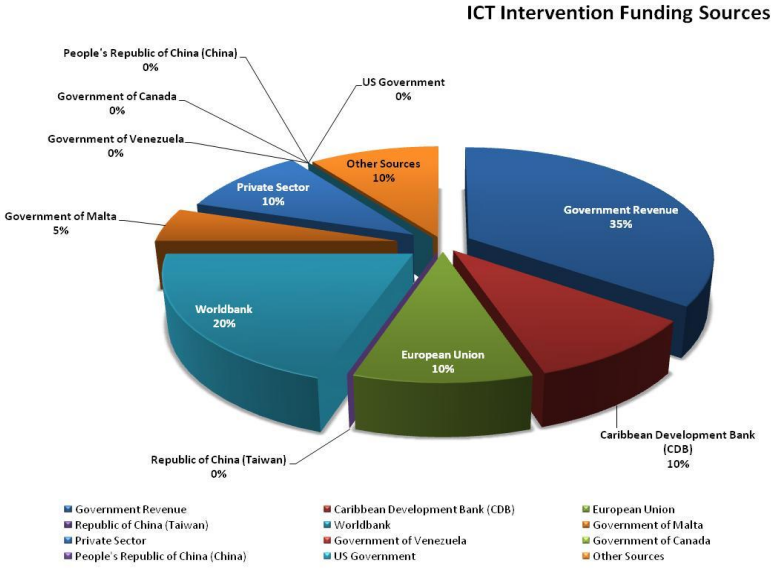


FIGURE 6: ICT PROJECT FUND SOURCES

3.3 Summary of key recommendations

The following are the primary recommendations of this review.

Governance

1. Establish (or, where already established, strengthen) a Ministerial Committee on ICT to be responsible for key whole-of-government ICT policies and the overall strategic vision for how ICT should support the achievement of the Government's outcomes and wider policy agenda.
2. Create an ICT Governance Board with a strong remit from the Government to drive the agreed recommendations arising from the review and focus on addressing impact assessment exercises.

Skills

1. Create a public sector ICT career structure, including training and development programs specifically in project assessment methodologies and other key project management skills areas.

Implementation

Is it recommended to involve the adoption of a national ICT impact assessment policy together with the strengthening or introduction of a governance body mandated and empowered to work on whole-of-government priority setting and impact analysis for ICT investments across government portfolios. Based on the experience of creating sustainable change in public and private sector environments, there are two critical requirements which will determine the success of this reform program: firstly, sustained leadership and drive at ministerial and key official levels; and secondly, ensuring that the enablers of change are properly resourced, not only in funding terms but also with

skills of the right competence. Given that these two requirements are met, the recommended actions and changes can be successfully implemented over the next two to three years, so as to deliver substantial benefits to regional governments.

4.0 Proposed Model

4.1 Participatory Information Communication Technology Impact Assessment (PICTA)

Introduction

Participatory Information Communication Technology Impact Assessment (PICTA) represents a blended approach of participatory and rapid research methodologies, combined with the aim of providing a practical and flexible approach suitable for ICT impact assessment in the region. This method specifically draws on the qualitative methods of inquiry of Participatory Action Research (PAR) and Rapid Assessment Process (RAP), and the quantitative method of inquiry of Questionnaire-based Survey Research. The PICTA approach employs an intensive team-based approach, which permits an effective inquiry to be completed in four to six weeks. The approach also embraces the view that research efforts conducted in the region have traditionally excluded local constituents from the research process (limited to data collection) and, as such, attempts to reverse this practice by proposing a more inclusive, transformative and empowering approach.

As depicted in Figure 7, the PICTA approach targets the public service (government ministry or department, agency, etc.) and the general public (communities or special groups of persons) as its primary stakeholder focus domain. In addition, the PICTA approach seeks to determine overall impact through focused investigations of the outputs and outcomes of ICT interventions.

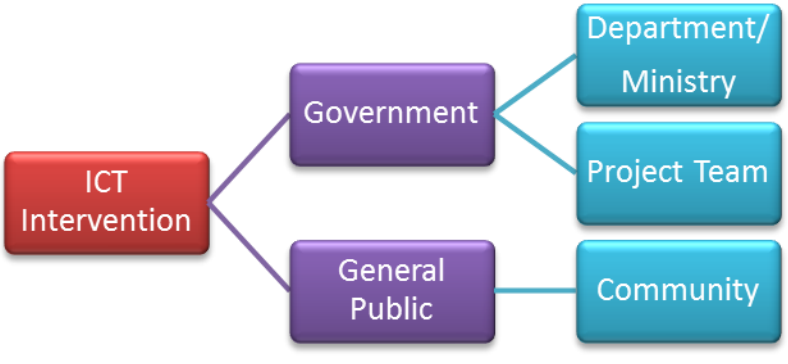


FIGURE 7: ICT IMPACT ASSESSMENT STAKEHOLDER FOCUS

In summary, a systematic and well-designed Participatory Information Communication Technology Impact Assessment (PICTA) can aid regional governments to determine the impact of ICT interventions using a variety of indicators and methods. Figure 8 highlights the six-step PICTA process.

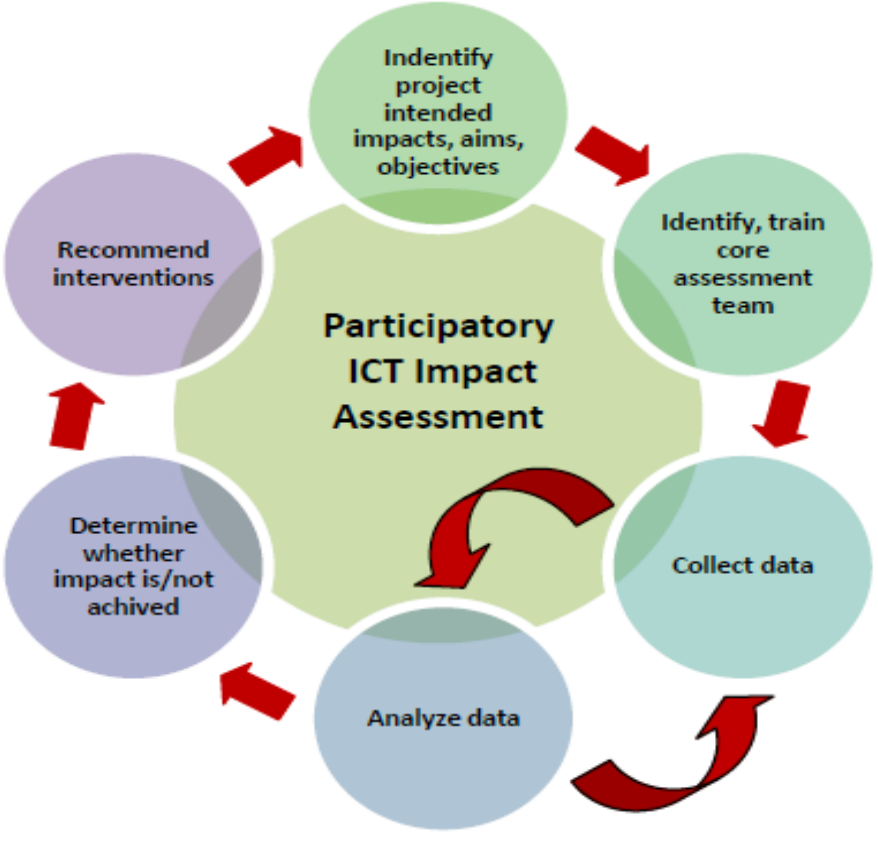


FIGURE 8: PARTICIPATORY INFORMATION COMMUNICATION TECHNOLOGY IMPACT ASSESSMENT (PICTA)

4.1.1 Project Identification

ICT interventions for assessment can be selected as a result of a planned work plan item, a directive from the Minister responsible for Information and Communication Technology, or via an external request. However, it is important that financial and time resources be provided with thoughtful consideration. Once identified, all project documentation, in particular information pertaining to the intended scope, goals and objectives of the project, should be made available to the assessment team. A formal letter requesting the assessment be conducted should be provided to the project team.

4.1.2 Core Assessment Team

The composition of the core assessment team should be reflective of a variety of portfolios. In particular, consideration should be given to ensure that the portfolios of Office of the Prime Minister, Finance and Information and Communication Technology are represented. Small teams of four to six members have proven effective, and are preferred to larger teams. It is expected that core team members be formally trained in qualitative and quantitative techniques. The expertise brought to the

situation by the core team members and their willingness to work close together is critical to the success of the assessment (Beebe, 2001). Once assembled, the core group must then be organised with a designated team leader. The main responsibilities of the team leader are to ensure an ethical and focused research activity, maintain team morale, and ensure that administration support is provided.

4.1.3 Additional Team Members

Additional members may also be selected based on the domain of the ICT intervention. For example, a Participatory Information Communication Technology Impact Assessment (PICTA) team, conducting an impact assessment of the Health Information System (HIS) implemented six (6) months ago, might include a medical doctor, hospital administration personnel and patient records staff.

There is a growing recognition that research needs to embrace a more participatory approach, especially with regard to local constituents whose tax dollars often indirectly funds these initiatives, and who also should benefit from the implementation of such programs. Therefore as “outsiders”, the contribution of their knowledge and experiences can be extremely valuable to the assessment process.

4.1.4 Data Collection

Data collection, via the Participatory Information Communication Technology Impact Assessment (PICTA), seeks to obtain data from multiple sources in an effort to strengthen the validity of the data. This concept is known as triangulation. Three PICTA data collection techniques include team semi-structured interviewing, team observing and questionnaire-based surveys. An additional technique called mapping may also be incorporated if data collected from respondents is best communicated via simple graphics including drawings, pictures and sketches. All collected data is then discussed and synthesised amongst the group daily.

Team semi-structured interview

This data collection technique involves members of the assessment team asking semi-structured questions to an individual respondent or a respondent group. The process should be organised with a designated lead interviewer, scribe and time keeper. All members are encouraged to ask questions; however, an effort must be made to ensure that respondent(s) are comfortable during the process. Respondent interviewees are best selected randomly to ensure a representative sample.

Team observation

This data collection technique involves members of the assessment team observing the respondents in the natural environment in effort to validate data collected prior. This can be done obtrusively or unobtrusively. The process must be organised with detailed notes of the time, place, number of respondents, and a description of the observation.

Survey Questionnaire

This data collection technique involves the use of questionnaires administered manually or via the Internet. The major themes unearthed via the team interview sessions will guide question construction.

4.1.5 Data Analysis

The data analysis step of the Participatory Information Communication Technology Impact Assessment (PICTA) involves an in-depth examination that identifies issues and themes communicated by respondents and guides additional data collection efforts. First, the interview and observation logs/notes are carefully reviewed and responses collated per question. Then key issues of themes identified in phrases or sentences are highlighted. Exhibit 1 shows an example, of a list of respondents’ responses to a question regarding how they utilise their Community Centre Computer Lab.

RESPONDENT #1
The computers in the community centre are working well. I am able to send my son an email to stay in touch. But I have to send it quickly because ***the lab is very hot since the air conditioning stopped working*** *or before 5:00 pm*

RESPONDENT #2
I have not used the community centre lab because when I get home at 5:00 pm it is closed. But I hear the computers working ok. I am happy the community has the centre.

RESPONDENT #3
I rely on the community centre to surf the Net and to Facebook with my friends. Yesterday I even ***downloaded some cool music and games****. But what I really would like is that it opens after 5:00 pm and offers some* ***night classes in computers****.*

Exhibit 1. Sample Collated Respondent Interview Log

From the example, at least three (3) important issues have been identified by the bold and underlined text. These issues are (i) repairs are required to the air conditioning unit (ii) improved security measures should be adopted to control unrestricted downloads and (iii) there is a potential demand for introductory computer evening classes. There is also at least one recurrent theme regarding the need for extended hours of operation of the lab.

According to Beebe (2001) several cyclical periods of data collection and data analysis are suggested in effort to enhance clarity of understanding. Although there is no target number of cycles, the research team is advised to continue the iterative process until no significant new information is unearthed. Figure 9 shows a sample schedule of research activities the PICTA may consider.

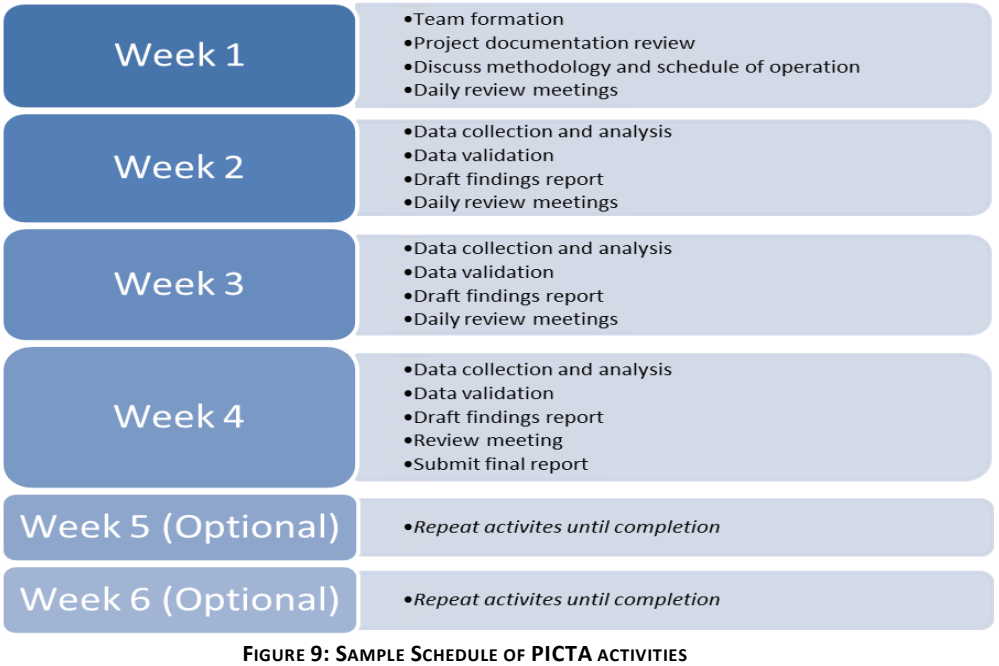


FIGURE 9: SAMPLE SCHEDULE OF PICTA ACTIVITIES

5.0 Bibliography

- Adam, L and Wood, F. 1991. An investigation of the impact of information and communication technologies in sub-Saharan Africa, Journal of Information Science, 25 (4), 307 – 318
- Alshawi, S. and Alalwany, H. 2009. E-government evaluation: Citizen's perspective in developing countries. Information Technology for Development, 15: 193–208. doi: 10.1002/itdj.20125
- Ashraf, Mohammad Mahfuz, Paul Swatman and Jo Hanisch, 2008, An Extended framework to investigate ICT Impact on Development at the Micro (Community) Level, Proceedings of the 16th European conference on information systems conference (ECIS 2008) pp. 1-12
- Beebe, James. *Rapid Assessment Process: An Introduction.* Walnut Creek: AltaMira Press, 2001.
- Cresswell, John W. *Qualitative Inquiry & Research Design.* 2nd Edition. Thousand Oaks: Sage Publications, Inc., 2007.
- Cresswell, John W *Research Design: Qualitative, Quantitative and Mixed Methods Approaches* Thousand Oaks: Sage Publications, Inc., 2*009*
- Creswell, John W. *Research Design: Qualitative and quantitative approaches.* 2nd Edition. Thousand Oaks: SAGE Publication, 1994.
- Denzin, Norman K & Lincoln, Yvonna S. *The SAGE Handbook of Qualitative Research.* Edited by Norman K & Lincoln Yvoanna S Denzin. Thousand Oaks: SAGE Publications Inc., 2005.
- Denzin, Norman K, and Yvonna S Lincoln. *The SAGE Handbook of Qualitative Research.* Edited by Norman K & Lincoln Yvoanna S Denzin. Thousand Oaks: SAGE Publications Inc., 2005.
- Esteves, R. Joseph. Government Information Quarterly, Vol. 25, No. 1. (January 2008), pp. 118-132
- Heeks, R., S Bailur, Analyzing eGovernment Research: Perspectives, Philosophies, Theories, Methods and Practice, Government Information Quarterly. 2007;24(2):243-165.
- Heeks, R. & Molla, A. Compendium on Impact Assessment of ICT-for-Development Projects. Development Informatics Working Paper Series, No.36/2009. Manchester: Institute for Development Policy and Management, 2009.
- Hunt, P., True stories: Telecentres in Latin America & the Caribbean, Electronic Journal of Information Systems in Developing Countries, 4(5), 1-17, 2001 Singh M, Sarkar P, Dissanayake D, Pittachayawan S (2008) Diffusion of E-Government Services in Australia: Citizens' Perspectives. In 16th European Conference on Information Systems (Golden W, Acton T, Conboy K, van der Heijden H, Tuunainen VK eds.), 1227-1238, Galway, Ireland. (ISBN 978-0-9553159-2-3)
- Tsuda, M.; Takahashi, K.I.; Hara, M.; Nemoto, Y.; Nakamura, J.; Nishi, S.; Takaoka, M.; , "New Index for Social Impact Assessment of ICT Services," Electronics & the Environment, Proceedings of the 2007 IEEE International Symposium on , vol., no., pp.16-18, 7-10 May 2007 Vanderstoep, Scoot W, and Deirdre D Johnston. *Research Methods for Everyday Life.* San Francisco: Jossey-Bass, 2009.
- Wang, L., Bretschneider, S. and Grant, J., 2005. Evaluating Web-Based E-Government Services with a Citizen-Centric Approach, Proceedings of 38th Annual Hawaii International Conference on Systems Sciences, Big Island, Hawaii

Chapter 6: Regional ICT Policy Document- Long-term, Strategic Considerations

The research under the Rapid Response Initiative has created an avenue for wider insight into the ICT sectors across the region. Though initially aimed at identifying and addressing immediate areas of policy deficiencies, an analysis of the research findings of the RRI projects identifies some key long term issues that must be addressed. These issues have been found to span all the major sub-sectors across the region. As such, it is critical that any long term efforts aimed at the development of ICT on the local or regional levels must have strategies for addressing these issues as a fundamental component. The four main issues of sector development will now be discussed.

Developing creative human and financial resource strategies

A key challenge to the sector across the region is that of limited resources. There are two aspects to this challenge, the first being limitations in financial resources. Many ICT and ICT development related projects and/or initiatives are generally supported by external funding, as in most cases national budgets are not able to provide the requisite support. This is also true for the operations of many ICT agencies and government departments. In the developing ICT services sub-sector, a lack of resources severely impairs the operations of many small and medium enterprises and is a disincentive to potential businesses. Similarly, in the area of security, there are many initiatives and projects that are solely dependent on external funding, which is generally only available for very limited periods.

The second and more critical aspect is the lack of human resources. In many departments and institutions, e.g. the regional Statistical Offices, there is a scarcity of skilled ICT personnel. Consequently, this limits the functionality of these departments and agencies, and many are unable to execute their stated mandates and missions. In some cases, the lack of human resources has contributed to projects being aborted. Without the skilled personnel, it is impossible to further develop and build the sector.

It is therefore evident that a key long-term objective in the development of the sector must be the addressing of this issue. Creative solutions must be developed and coupled with strategic and thorough implementation techniques. The investment in the development of the human capital must be seen as an issue of the highest priority by all regional stakeholders. Joint action must be taken by governments and private stakeholders in further promoting careers in ICT and then presenting opportunities for training and capacity building through grants, scholarships and other types of funding. The development of a more robust human resource capacity will better position the regional sectors to negotiate and acquire better external funding arrangements, as well as more effectively utilise national budget allocations.

Proactive and current approaches to ICT

Most of the ICT sectors across the region were birthed during the era of the rapid expansion of Public Switched Telephone Network-based telecommunications. As such, this was the context for the development of the regulatory frameworks and approaches. The subsequent thrust for liberalisation over the past decade and a half has resulted in some amendment to these frameworks and approaches. However, since that time there has not been significant changes to regulatory frameworks and other aspects of ICT development throughout most of the region. This “need to update” is a key requirement across all sub-sectors. The frameworks for regulating the telecommunications sub-sectors are still directed to fixed-line network operations in most instances; in others, the treatment of mobile networks does not properly consider the market dynamics. Similarly, the broadcasting sub-sector has very limited frameworks, most developed during the era of radio broadcasting. In the ICT-services sub-sector, the current policy frameworks show little in the support of the sub-sectors’ development. This prompts the consideration of whether this sub-sector has been considered and planned for, or simply just emerged and was left to grow wildly.

Furthermore, the statistical data required to inform strategic sector development is often limited. This is a direct consequence of the fact that many Statistical Offices still operate in alignment with post-modern models; i.e. as departments or sub-departments of government bodies, and most ICT data is collected only by means of a few questions in a country's ten-year census.

The attainment of long-term goals and the realisation of sustainable development within the regional ICT sectors necessitate both an updating of existing sector frameworks and approaches, as well as proactively embedding measures for dealing with future growth. Archaic, inflexible, reactive approaches will not be able to address the issues brought by increasing convergence within the sector and the establishment of NGNs within the region. Conversely, proactive and updated approaches will provide avenues for addressing the issues of regulatory arbitrage, data shortage and enterprise development. These are all necessary to ensure properly functioning markets and sub-sectors, which in turn are fundamental aspects of a sustainable ICT sector.

Strategic Implementation and Evaluation Methods

A review and analysis of mission statements, policy documents and legislation of the various sub-sector institutions and agencies across the region, will reflect very clearly-defined goals and objectives, as well as procedures for execution. However, the research has found that in many instances, there are significant discrepancies and gaps in actual operational methods and standards. This is reflected on many levels. On the level of regulatory frameworks, it was found that many laws and policies are poorly implemented in day–to-day operations; in some cases, a consequence of limited resources. This creates avenues for arbitrage. Similarly, many agencies and/or government-instituted bodies do not carry out their stated functions and uphold their stated positions. This is significantly reflected in the area of ICT project implementation, wherein there is a general agreement by all on the absolute criticality of ICT to the region's development. Nevertheless, it was found that across the region, roughly only half of the projects implemented are ever managed and assessed to determine if the stated goals were achieved.

It is impossible for sustainable development to take place in such an environment. Long-term strategies for sector growth must include a focus on the development of effective implementation methods; the gap between stated objectives and positions and operational standards must be diminished entirely. Key to this is the development of the skilled human resource personnel, which is lacking in some instances. In addition, new methods of implementation must be put in place, with an emphasis on evaluation and assessment of activity, based on stated objectives. In other cases, institutions must simply muster up the willpower to enforce what has been previously declared.

Continued Movement toward Regional Functional Collaboration

The findings of the various projects have highlighted a very interesting scenario. On the one hand, it has identified problems that are regional in scope. For example, there are increasing numbers of crimes that are linked to criminal networks with regional and international scope. The regulatory issues arising from increasing convergence of the sector are similar in many territories across the region, and often involve regional actors. In like manner, there is a growing need across the regional sectors to collaborate in order to capitalise on economies of scale. Conversely however, it was found that there are several instances of bilateral agreements and sharing relationships between countries in the region, with countries external to the region; and very little between the countries of the region itself. It is evident that these two movements are somewhat out-of-step. However, there are areas where efforts are already being taken to adjust this; one being the area of crime and security. This movement towards greater functional collaboration is indispensable to the development of the regional sectors. Furthermore, greater effectiveness of the sector would require collaboration not simply between regional ICT sectors, but also with other sectors across the region. It is expected that this would continue to be a fundamental component of any long-term strategy for regional sector development, as global phenomena continue to make the region a smaller place.

Concluding Remarks on the Evidence for Caribbean ICT Policy Development

Caribbean Governments have recognised that Information and Communication Technologies (ICT) present opportunities for fostering national development and enhancing competitiveness. However, in order to catalyse the process by which ICTs yield those benefits, it is necessary to establish a sound policy framework, not only to encourage the effective use of OCTs but also to create an enabling environment for investment in ICT and to develop a robust ICT services sector.

The Caribbean ICT Policy Rapid Response Initiative (RRI) was envisioned to provide a body of research or evidence on ICT issues that would be used to formulate appropriate ICT policies. The research therefore was directed towards providing that evidence in areas identified as lacking by Caribbean policy makers, namely ICT Regulation, Data Acquisition, ICT Services Sector Development, Regional Collaboration in Combating Crime and ensuring Security, and Assessment of the Impact of ICT on Development in the region.

The Research was undertaken by Caribbean practitioners who appreciate and understand Caribbean institutional and cultural environments, making this body of work truly relevant to the region. The research papers provide timely information to Caribbean Governments and, in addition, make recommendations on approaches that, if adopted, will advance policy formulation and, as a result, will advance economic and social development for all Caribbean peoples.

This Policy Briefs document was developed based on 5 full research papers. Interested persons may contact the Caribbean Telecommunications Union, should they wish to access copies of the full research findings. Additionally an Executive Summary Publication of the Caribbean ICT Rapid Response Initiative is accessible on the Caribbean Telecommunications Website under the ‘projects’ section.

Meet the Researchers

Mr. Kwesi Prescod

Kwesi Prescod (BSc Eng, MBA) is a professional with over thirteen years of experience in a wide breadth of aspects in the areas of the business development Information and Communications Technology (ICT).

Mr. Prescod has extensive experience in the management, development and operations of the core and access networks of complex multi-service telecommunications networks both within the Caribbean region and further afield. Mr. Prescod has worked on a range of 2G to 3G technology environments on behalf of a range of parties varying from carriers such as TSTT (Trinidad and Tobago), Nextel Communications (USA) and mmO2 (UK) to vendors including Lucent Technologies (USA), Nortel Networks and Ericsson (UK).

Since 2005, Mr. Prescod has made significant contributions to the development the ICT Policy function for the Government of Trinidad and Tobago, leading the government thrust to market liberalisation and Regulatory strengthening, as well as spearheading the development of the National Broadband Strategy, which included, among other things, championing the establishment of IXPs as key aspects of national and regional Internet development. Mr. Prescod also lead the development of fundamental "integrated Government" frameworks – dealing with legislative, institutional and operational considerations, which are still being leveraged today in on-going initiatives to infuse ICT into the systems of public administration of Trinidad and Tobago.

Most recently, Mr. Prescod has provided consultancy support to regional and international agencies that are in the process of developing intra-regional policy frameworks within the ICT sphere. In this regard, Mr. Presod has served as a regional expert on Telecommunications and ICT policy matters in the ITU/CTU HIPCAR Project. He was the main researcher on the project, "Implications of Technology and Service Convergence on the Operational and Organisational Aspects of Regulation".

Mr. Wayne Butcher

Mr. Butcher is an information technology professional and is currently a Research Associate at the Centre for ICT at the University of Trinidad and Tobago. In a career spanning over 25 years he has worked in the fields of engineering, management and ICT. In these capacities he has held positions in both industry and academia. This includes over 12 years working in the local telecommunications sector in research and development, engineering and ICT.

Mr Butcher holds degrees in electrical and electronic engineering from the University of the West Indies and in computing science from the Imperial College of Science and Technology. He is currently a research associate in the Centre for ICT at the University of Trinidad and Tobago, where he is engaged in teaching and research. Chief among his academic interests are ICT for development (ICT4D) and the development of embedded systems.

Mr. Butcher has also been engaged in consultancy for over 15 years. He has worked for a number of local, regional and international clients in the fields of industrial development, energy, ICT and strategic management.

Mr. Lancelot Busby

Mr. Lancelot Busby is a former United Nations staff member of long standing and an accomplished Statistician who has contributed significantly to statistical development in the Caribbean and further afield. Mr. Busby has accomplished the following:

1. Graduate of the University of the West Indies
2. Completed post-graduate training at the Centro Interamericano de Ensenanza de Estadisticas (Inter-American Center for the teaching of Statistics) in Chile
3. Completed an MBA degree from Brunel University in association with Henley, The Management College of the United Kingdom
4. Has been the author of numerous papers and publications on statistics

In addition, for many years he has been at the forefront of the move to modernize statistics and statistical services in the Caribbean. For many years as staff member of the Economic Commission for Latin America and the Caribbean (ECLAC) he has delivered advocacy and technical assistance to the Caribbean Countries in various aspects of Statistics. His Colloquium on Statistics and the New Technologies in 1989 was the first formal attempt to discuss the need for modernization of statistics in the Region.

After his retirement from ECLAC, Mr. Busby served for one year as Advisor to the Research Unit of the Central Bank of Trinidad and Tobago, after which he has been engaged in a number of consultancies, among them being the following:

- Conducted numerous project evaluations on behalf of the International Agencies
- Served as Consultant to Central Statistical Office of Trinidad and Tobago
- Member of the Statistics Sweden consultancy team that reviewed the statistical situation in Trinidad and Tobago and made recommendations for its modernization
- Consultant to ECLAC on estimating the social and economic consequences of natural disasters that affect the Caribbean countries
- Reviewed the Disaster Management infrastructure of a Central American country and made recommendations for its improvement
- Leading advocate and consultant on the design and construction of economic and social databases in Caribbean countries. Performed a consultancy in this regard for ECLAC in 2011
- Currently engaged in the design of a Regional Statistics Work Programme for the Caribbean countries that are members of CARICOM
- Part-time lecturer in a Master's programme in Official Statistics programme at the University of the West Indies
- Author of many papers on Statistics

Mrs. Michele Thomas

Mrs. Thomas is currently a Research and Management Consultant. She has a background in telecommunications policy and social and economic research and planning, having worked as Director, Policy and Strategic Planning at the Spectrum Management Authority (2002-2008), and as Senior Economist at the Planning Institute of Jamaica (1998- 2002).

Since 2008, Mrs. Thomas has been involved in ICT policy research and teaching, as well as the provision of business services to a number of institutions including the Telecommunications Policy and Management Programme, Mona School of Business, University of the West Indies, Mona, various Government Ministries and Agencies and Non-Government organisations.

She holds a MSc. Regulation and Policy (Telecommunications), University of the West Indies (St. Augustine), 2006; a MSc. Economics from the University of London (Birkbeck College), 1997; and a BSc. (Hons.), Economics and Management from the University of the West Indies (Mona), 1990.

Mrs. Thomas was the main researcher on the project, "Collaboration Policy for Functional Cooperation through ICT, in the Area of Crime and Security".

Mr. Pierre Bowrin

Mr. Pierre Bowrin is the Information Communication and Technology Policy Advisor at the Department of Technology for the Government of Saint Kitts & Nevis. His responsibilities include ICT policy development and project management. In addition to his professional activities at the Department of Technology, he also serves as an e-tutor for the University of the West Indies – Open Campus, and is a youth advocate in his community.

Mr. Bowrin is currently pursuing a PhD in Governance & Public Policy at the Sir Arthur Lewis Institute of Social & Economic Studies at the University of the West Indies in St. Augustine, Trinidad. His research seeks to investigate the impact of Information and Communication Technology (ICT) interventions employed to strengthen public health systems in the Organisation of Eastern Caribbean States (OECS). Specifically, the study aims to assess the impact of Information and Communication Technology (ICT) interventions employed to support the collection, management, analysis and dissemination of public health data in OECS member states.

Mr. Bowrin holds a Bachelor of Business Administration from the School of Business at Cameron University, and a Master of Science degree in Information Systems from Central Michigan University. He is the co-author of the article, "Information Security in Caribbean Banks", which was published in the online journal "Issues in Information Systems" in 2005.