Development of ICT Indicator Collection - the experience of Trinidad and Tobago

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BACKGROUND

Measurement of the information society by the collection of ICT indicators is considered a key input to the development of the national ICT initiatives. Initial stocktaking lays the foundation from which further progress is made and measured, but given the dynamic nature of the technologies, care must be taken that indicators remain relevant to the development objectives.

Prior to the development of ***fastforward -***- the National Information and Communications Technology Plan[1] - indicators had been collected on an ad hoc basis to support specific policy and research projects (see Table 1). While the quality of the data was satisfactory in most instances, comparison between various efforts remained limited since questions and response options would vary between survey instruments. This also meant in many cases, that these studies would derive divergent conclusions, given the disparities in the process.

With the creation of ***fastforward,*** the quality of data must be maintained but it has now become as important that the data collection is homogeneous and can support the objectives of the plan which has a wide-reaching span, covering public and private sector developments as well as that of the civil society. Measurement and growth initiatives must be designed that would harmonize the collection of these indicators to ensure compatibility with regional and international efforts and that the relevant and appropriate comparisons would be made in benchmarking exercises.

Responsibility for the collection of this data currently lies within the Ministry of Public Administration and Information, where ***fastforward*** was developed.

OBJECTIVES FOR THE COLLECTION OF ICT INDICATORS

- Development of a national ICT database populated with reliable, current data
- Design indicator collection to support all ICT-related public policy initiatives, with special emphasis on the programmes in ***fastforward,*** as well as to evaluate the success of current initiatives
- Streamline the collection of ICT indicators to share resources and avoid redundancies
- Update ICT indicators where appropriate, to ensure compatibility with global and regional efforts which would allow for more accurate benchmarking

[1] http://www.fastforward.tt

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TABLE 1: SURVEYS COMPLETED TO DATE

Survey	Administering Body	Date Conducted	ICT Areas of Measurement	Method of Administration	# of Question	
					QL	QN
Utilization of Information Technology by Households http://www.niherst.gov.tt	National Institute of Higher Education, Research, Science and Technology (NIHERST)	2001	Computer ownership Computer and IT usage Satisfaction with service providers and concerns for security	Interview	17	5
National Survey on ICT Usage and Awareness by Businesses http://www.ecommerce.gov.tt	National E-Commerce Secretariat	2001	Internet Usage Website Activity E-Commerce Activity E-Commerce Issues	Self-Administered	22	11
National Survey on E-Commerce Usage and Awareness among Households http://www.fastforward.tt	National E-Commerce Secretariat	2003	Computer Ownership and IT Knowledge E-Commerce Activity E-Commerce Issues	Interview	17	17
National Survey on E-Commerce Usage and Awareness among Businesses http://www.fastforward.tt	National E-Commerce Secretariat	2003	IT and Internet Usage Website Activity E-Commerce Activity E-Commerce Issues	Interview	30	12
Opinion Leaders Panel Studies (Wave 2)	Ministry of Public Administration and Information	2003	Awareness of Government ICT initiatives Technology for payment of services	Interview	1	5
Opinion Leaders Panel Studies (Wave 5) (Qualitative and Quantitative Surveys conducted separately)	Ministry of Public Administration and Information	2005	ICT and E-Commerce Activity E-Government Indicators Fastforward Activity Telecommunications	Focus Group (Qual) Interview (Quan)	40	40

DEVELOPMENT FRAMEWORK

The purpose of collection and design of the indicator sets should serve to support existing projects and programmes as a mechanism for feedback and also be a useful planning tool for strategic ICT policy development. Benchmarking is used to then assess the country against comparable others for the purposes of sharing information and adopting best practices which would aid ICT development efforts.

Internationally, the development standards for benchmarking the level of maturity consist of measuring citizens, businesses and government[2] in the following areas:

- Readiness – infrastructure as well as attitudes towards participating in the use of ICTs
- Activity – level of purposeful use and the degree to which ICTs are used in a broad and sophisticated way
- Impact – change to behaviors, lifestyles or standard of life which can be attributed to the adoption of ICTs

Developing countries do however have a particular challenge with benchmarking exercises. While indicators measuring growth and maturity of the e-economy are useful for policy development and strategic planning initiatives, these existing indicators may not be the most appropriate for measuring the real progress within these economies where there may still be the need to explore fundamental components of ICT development. For example, measuring the penetration or density of public access facilities for ICTs could be give a better understanding of citizen access and usage rather than measuring the penetration or density of residential broadband services, in countries where telecommunications costs remain high due to a monopolistic environment.

Nevertheless, attempts should be made to balance measurement efforts that are of immediate value and provide feedback on short and medium term developmental plans with the requirements of reporting to international fora, as well as for purposes of technical assistance and capacity building. A sample framework is suggested that highlights the generation of indicators based on public policy objectives.

Policy Objectives to support E-Economy development	**Statistical Indicators**		
	Citizens	**Businesses**	**Government**
Provide convenient and affordable access to infrastructure	• PC ownership by household • Barriers to ownership including cost sensitivity • Internet access	• % of computers owned per employee • Internet access • Use of	• PC allocation per government agency (density) • Public (subsided) access points

[2] International e-Commerce Benchmarking – Experimental statistics database http://www.statistics.gov.uk/about/methodology_by_theme/benchmarking/downloads/e-commerce_benchmarking.pdf

	by household • Access to other mobile devices • Availability and use of broadband	Intranet/Extranet	available
Promote useful and beneficial activity using ICTs	• PC usage and frequency • Internet usage and frequency • Issues affecting trust and confidence using ICTs	• % of transactions online (B2B and B2C) • Incentives available for e-business deployment • Production of local content for ICT	• Government service available online • Government information available online • Citizen/business demand for government services online
ICT as a targeted growth sector	• IT workers as a % of the workforce • Level of skill/training among ICT workers	• IT sector contribution to GDP • Trade in ICT goods and services	• Tax and fiscal incentives for IT sector development

PROPOSED METHODOLOGY FOR ONGOING COLLECTION

A common set of core indicators has been developed for both household and business measurements. These indicators are established with questions and response options that have been proposed by OSILAC/ECLAC submissions for the region which will further contribute to the WSIS deliberations in 2005.

In addition to these core indicators, the ICT indicators investigate qualitative and quantitative issues as follows:

- ICT Usage
  - IT ownership by household
  - Computer/Internet Usage by individual
  - E-Commerce Activity
  - ICT/E-Commerce Issues
- E-Government Indicators
  - Usage
  - Attitudes
- Telecommunications
  - Telephone Numbers
  - Mobile Internet Services
  - Internet Service Provides

  - Mobile competition and service
  - Local and International Telephone Service
- Broadcasting
  - Content
  - Competition
  - New digital broadcasting
  - Cable television

Measurements framework in the context of *fastforward*

As part of the governance programme for the National ICT plan, a framework is being designed that supports the execution of programmes and projects. This focuses on a sequential determination of the programmes by project outputs and project outcomes which would provide feedback as the plan is implemented. Project ***outputs*** would directly measure the success of specific initiatives in terms of the completion of the project. Project ***outcomes*** would then measure success in terms of achieving the higher-level ICT development objectives. A sample frame is illustrated in Table Two.

TABLE TWO: FRAMEWORK OF MEASUREMENTS FOR *fastforward* IMPLEMENTATION

Description			
Extensive diffusion of ICT into the broad community is essential if the citizens of Trinidad and Tobago are to benefit fully from the global information society. *fastforward* aims to dramatically increase the number of ICTs in home and also provide a large number of Community Access Centres for those individuals who cannot afford computers and Internet connectivity in their homes.			
Desired Outcomes from *fastforward* Strategy	**Key Program Output Targets**	**Program Output Performance Measures**	**Ministry Responsible for Target**
• Increasing levels of ICT in homes • Increasing levels of ICT access in communities for development purposes	**2008** – Over 50% of homes will have personal computers and affordable Internet access **2008** - Increasing the number Community Access Centres	• % of homes with computers • % of homes with Internet access • Number of Community Access Centres	
	Key Outcome Targets	**Outcome Performance Measures**	**Ministry Responsible for Target**
	2008 - 50 % of population considered regular Internet users • Improvement in community development through ICT	• % of population using Internet more than 3 times a week • Feedback and reports from Community Access Centres	

It is envisioned that this framework remain highly flexible to accommodate the project life-cycles and the varying requirements throughout the stages of the plan. Initially, the

management of the pathfinder projects would establish the initial indicators for collection. This framework also ensures that indicator collection remains relevant to the overall strategic vision of ***fastforward.***

Sectoral approach to measurements

While a central agency has been charged with coordinating the collection of ICT indicators, specific sectors are encouraged to conduct their own studies within the central framework. One current incidence of this is in the Ministry of Education (MOE) which is currently piloting a data collection instrument that aims to measure ICT readiness in the following areas:

- hardware and software infrastructure
- ICT competencies of the schools' administrators
- use of ICTs in the classroom
- attitudes towards ICTs in education
- levels of ICT training that exist among teaching staff

The results from this initial study would now become a component of the ICT indicators collection and would be available for other programme planning uses in all public agencies.

CONCLUSION

The current repository for ICT data is within the ***fastforward*** division of the Ministry of Public Administration and Information. With the aid of national statistical agencies, it is anticipated that a core set of indicators would be combined and collected for administration during national surveys for timely and standardized updates. Indicators marked for collection must meet the needs of national planning agencies and therefore must pass the test of "relevance". As milestones are achieved in national ICT development, then indicators must be reviewed for relevance to future needs as well as for archival purposes. This is as important given the dynamic nature of technological development and the changes that would occur as new technologies become available.

APPENDIX ONE – Brief Country Profile of Trinidad and Tobago 2004

Population	1,290,600
Density (Per sq km)	267.3
Population Growth Rate (%)	0.6
No. of Households	303,871
Gross Domestic Product (GDP in millions of US$)	11409.2
GDP per Capita (US$)	8,799
Inflation Rate (annual % change of the RP1)	3.7
Unemployment Rate (%)	8.6
Exchange Rate TT$/US$	6.27

Source: Central Statistical Office

APPENDIX TWO – List of ICT Indicators as of 2005

HOUSEHOLD INDICATORS

A. ICT AND E-COMMERCE

IT Ownership Household

1. Computer ownership by household, number of computers owned
2. If the household does not own a computer, what are the reasons why?
3. Is there an Internet connection? If so, what kind and who provides the service?

Computer and Internet Usage

4. Computer usage – place and frequency
5. E-mail address ownership
6. Internet usage – place and frequency

E-Commerce Activity

7. Have you ever purchased anything on the Internet or has anyone ever purchased something on your behalf?
8. What are the reasons for not using the Internet to buy products/services
9. Have you used the Internet to look for information on a product or service with the intent to purchase (either on or off the Internet)?
10. Frequency and type of Internet purchase
11. Value spent on Internet purchases
12. Method of payment for Internet transactions
13. Satisfaction with purchases over the Internet. If dissatisfaction, why?

ICT and E-Commerce Issues

14. Current consumer protections laws and how do they apply to Internet transactions
15. Should Internet transactions be subjected to government tax?
16. Role of the Government in promoting the use of the Internet.
17. Would citizens be willing to accept information from the government via email?
18. What government services would citizens be willing to use on the Internet?
19. Issues that citizens have with providing information on the Internet as regards privacy, security and authentication
20. Willingness to use a public facility to access the Internet and proximity of the facility as an incentive.

B. E-GOVERNMENT INDICATORS

21. What is the level of knowledge/experience with using government websites?
22. Have you ever contacted the government via its websites or via email for any services required e.g. Board of Inland Revenue (tax services), Ministry of Legal Affairs (intellectual property)
23. Have you had negative experiences in any of your dealings with government web sites?
24. How safe do you feel with providing personal information on a government web site?
25. Do government web sites make it easier to find the information that you want?
26. How important is it to you that government information/services are available on the Internet?
27. Do you think that Government on the Internet brings people closer to government by making it easier to find information? by providing better service? for people to communicate their views to government?
28. What do you like most/least about access to government information and services on the Internet?

29. If the government could do one thing to improve its Internet services and communication with people, what should it be?
30. What is your main reason for using government information on the internet? (personal, school, research, work-related)

C. TELECOMMUNICATIONS

Telephone Numbers

31. Would you willing to pay an extra amount to keep your phone number if you go to an alternative provider when competition comes? How much would you be willing to pay?
32. For the case given above, would you prefer:

(a) to pay an additional amount every month regardless of whether or not you change provider, you keep your number when you change or you don't keep your number when you change? How much would you be willing to pay?

or

(b) to pay an additional amount every month only if you keep your number when you change, but do not pay anything extra for not changing providers or not keeping your number when you change providers? How much would you be willing to pay?

Mobile Internet

33. Do you presently use mobile Internet services, that is, use the Internet on your cellular phone or mobile device, such as your laptop? Do you need or want to use mobile Internet services at this time?
34. If you have used mobile Internet services, what do you think of its quality? Do you think it is price effective? Would you substitute your home dialup services with mobile Internet services?
35. Would you like to conduct financial transactions in mobile outlets, such as taxis and buses, or on boats and planes, such as paying fares or purchasing items? Would you use a credit card for such transactions, or would you prefer to use debit card transactions, such as LINX?

Internet Services

36. Do you presently subscribe to Internet services at all? If so, do you use a dialup service? If you do, are you satisfied with its connection speed and its rates?
37. Are you presently interested in high-speed Internet services? Do you think the price is prohibitive?
38. Are you presently using high-speed Internet services? Do you think the price is worth the higher speeds? How would you rate the services at this time? Are you satisfied with your connection speed of these high-speed Internet services?

Competition and service

39. Would you definitely switch to another mobile cellular provider if competition enters the cellular market even if the price of the service remains the same, or would you ensure that the competitor's rates are cheaper before switching?
40. Are you satisfied with the customer service provided by the local telephone company? What attributes are you most dissatisfied with, if any? On a scale of 1 to 10 how would you rate TSTT's quality of service for both fixed line and mobile services?
41. Would you be willing to use a satellite based mobile telephone and /or Internet service with worldwide coverage? How much extra would you be willing to pay for such a service?

Local and International Calling

42. Would you pay for access to your phone bill on the Internet, to determine your balance on your phone bill during the month? How much would you be willing to pay?
43. What do you think of the present phone bill? Do you think local calls are reasonably priced? What would you tolerate an increase of 10% on your local calls and line rental?
44. What is your opinion regarding the International Call Centers in terms of pricing, customer service, the quality of the phone calls they provide and convenience? Do you view these Call Centers as an important alternative to TSTT's international service, especially for the low income sections of the national community?
45. The continued provision of services without a licence by International Call Centers may mean that rates for international calls may continue to drop, however the rates for local calls would correspondingly rise. At the risk of increased prices for international calls, do you think that the International Call Center Service should be licensed? What is more important to you, cheaper local rates or cheaper international rates? Would you prefer that international call rates drop, with increases in local calls?

D. BROADCASTING

Content

46. Do you think there's sufficient local material on our airwaves (television and radio) today? Do you want more local material broadcast on our airwaves? Do you think our local broadcasters should air a minimum amount of local content per day?
47. At Carnival time, do you think there's enough variety on our local airwaves?
48. Do you think that there's too much lewd and vile content, including obscene language, on our broadcasting stations? Can you list stations that broadcast this lewd content? Do you think these should be banned entirely, given reduced airtime, or be re-scheduled to off-peak times such as 1am - 4am on mornings?

Competition

49. Do you believe there are enough radio stations? Do you think there are enough local television stations, such as TTT, TV6 and Gayelle? Do you believe there are enough radio stations which broadcast non-Christian and /or non-English content, such as Hindi, Arabic, Spanish and French?
50. How often do you watch television? How many hours per day would you watch television? How often do you listen to the radio? How many hours per day do you listen to the radio?
51. Do you switch rapidly between radio stations and our local television stations while listening or viewing, or do you select one station and view/listen for an extended period of time?
52. What do you think of the quality (audio and video) of our local broadcast? Do you think the quality of the airwaves should be better, or are they adequate?
53. What do you think of the present coverage of our local broadcasts? Do you think they are adequate, or should they have greater and broader reach? Do you receive an acceptable signal in your residence and/or place of occupation?

New digital broadcasting

54. Would you buy a new digital radio if you had access to more radio stations, higher audio quality, and add-on services such as text and picture advertising, broadcast schedules and interactive controls? How much would you be willing to pay for a simple new radio offering these services?

55. Would you buy a new digital television or digital television set-box, if you had access to more stations, higher audio and video quality, and add-on services such as broadcast schedules and interactive controls? How much would you be willing to pay for a simple new television or set-box offering these services?

Cable TV

56. Do you subscribe to Cable TV? If not, do you think the cost is prohibitive?
57. If you don't have Cable TV now, but had it before, why did you give up the service?
58. Are you satisfied with the quality of the Cable TV offering? Are you satisfied with the cost of Cable TV? Would you like to see more local content on Cable TV?
59. If another Cable TV provider became available, offering the same channels at the same price, would you try the new provider?
60. What would you prefer in a new Cable TV station; more channels, a lower price or better customer service?

BUSINESS INDICATORS

A. IT AND INTERNET USAGE

1. How many computers does your firm have?
2. How many of these computers have Internet access?
3. How dependent is your organization on computers to accomplish your daily business activities
4. What type of Internet connection do you use for your Internet access?
5. Who is your main ISP?
6. What are the uses of the Internet at your company?
7. How is Internet access provided to your employees?
8. How is e-mail provided within your company?
9. If your company has an Intranet, what is it used for?
10. Does your company have a full-time IT systems administrator or IT department?
11. Is this person part of the overall executive team in your company?
12. What % of your overall budget is allocated to IT for the current financial year?
13. Does this represent an increase from the previous year?

B. WEBSITE INFORMATION

14. Does your company have a website?
15. Why did you establish a website?
16. In what year was the website established?
17. Is your website hosted locally?
18. If not, please indicate why?
19. Did you outsource the creation/maintenance of your website?
20. How frequently do you update the website?
21. How do you promote your website?
22. On average, what is the monthly traffic to your website?
23. Has your website increased your revenue?
24. What % does this increase represent?
25. How has the website changed the geographical source of your revenue?

C. E-COMMERCE ACTIVITY

26. How would you describe the sophistication of your e-commerce strategy?
27. What percentage of your total sales are received/processed via electronic means?
28. Which segment (B2C, B2B, B2G) represents the highest number/value of your electronic transactions?
29. What factors drive the development of E-commerce in your company?
30. What internal business process issues will most significantly affect the growth of E-commerce?
31. Do you use the Internet to assist with procurement and distribution?
32. What procurement and distribution activities do you engage in online?
33. What are the payment systems you offer for online sales?

D. E-COMMERCE ISSUES

34. What are the significant barriers to developing e-commerce in your company?
35. What are the factors affecting the development/growth of e-commerce in Trinidad and Tobago?
36. What are the significant issues affecting trust and confidence in doing e-commerce in Trinidad and Tobago?
37. What do you see as the major role of government in promoting trust and confidence in e-commerce?
38. What in your opinion is the best way to manage the organization that gives out website names
39. What are the important technology issues that impact the development of e-commerce in Trinidad and Tobago?
40. In your opinion, what taxes would impact most significantly on the viability of e-commerce in Trinidad and Tobago?
41. What government services would you be most likely to use on the Internet
42. Do you think that the local private sector is doing a good job at promoting e-commerce?