

ACKNOWLEDGEMENTS

*Systems Consulting*TM would like to sincerely thank all those organizations (in both the Public and Private Sector) who so graciously consented to share their insights and opinions with us.

Our special thanks to the National Council for Science and Technology (NCST) for facilitating this research exercise and for their support and assistance throughout the duration of this study.

EXECUTIVE SUMMARY

The Government of Barbados through the National Council for Science and Technology (NCST) contracted *Systems Consulting*TM to conduct a study to determine Barbados' state of e-readiness. To adequately assess the issues associated with e-commerce and its current and potential impact on Barbados', a two-pronged approach involving the gathering of secondary and primary data was undertaken.

The secondary data collection phase sought to obtain from several sources information related to various telecommunication, economic, macroeconomic, social and connectivity indicators. The primary data was collected from the following three major stakeholders, namely (1) government organizations, (2) private businesses and (3) the general public.

The data collection phase of the project, which started in mid-November 2002 and was completed at the end of February 2003, gathered secondary data from three (3) organizations, and primary data from ninety-one (91) businesses (13 Government departments, 20 Statutory Corporations and 59 Private Sector Companies) and two hundred and fifty eight (258) members of the general public.

Data were then analyzed using SPSS statistical analysis software.

1.0 KEY FINDINGS

Two separate interviewing instruments were administered to the general public and to the business community. The key findings below are sectioned between these two groups, however where possible, results have been amalgamated.

- Internet usage in Barbados, both within the home and the workplace, is on the increase.
 - Just under half (48%) of all the organizations interviewed indicated that at least three-quarters of their employees have access to the Internet.
 - Just over six in ten (62%) residential respondents indicated that they are users of the Internet, who report spending an average 12 hours a week (or about 1.75 hours/day) on the Internet.
- However, there is still evidence of the “*Digital Divide*” as Internet usage has still not yet permeated all segments of Barbadian society. The average Internet user is younger, more educated, students and professionals. More specifically:
 - 71% of users are under 35 years of age
 - 65% have either a Vocational or University education
- Dial-Up via a 56K modem is the most common type of Internet connection. Broadband, high-speed connections currently have a very low incidence and are used primarily by employees in Statutory Corporations and Private companies.
 - 97% of the general public indicated that they use a 56K Dial-Up connection at home, while 55% of the organizations use this type of access.
- The majority of Internet users, both commercial (76%) and residential (74%), are generally satisfied with the reliability of their connections. However, within the business sector, particularly among Private Sector organizations, there is dissatisfaction with the speed of their connections.
 - Less than one third of organizations interviewed consider their connections to be fast/very fast, while 53% felt that theirs was just adequate.

- Another major area of discontent is with the Internet rates currently being charged by the ISPs in Barbados.
 - Over half (53%) of the members of the general public and 34% of business interviewees indicated dissatisfaction with the current rate structure.

The key findings specific to the business community are summarized below.

Accessibility/Reliability of Internet Connections

- To improve the accessibility/reliability of Internet connections, the overwhelming response given across the three business types, was having the ability to have **faster speeds of connection to the Internet**. The widespread introduction of services like ADSL, GSM mobile access and T1 lines were all made as recommendations. Over half (51.4%) of the responses included mention of these improvements to the current service.
 - *“Increase bandwidth”*
 - *“Make broadband more accessible and faster so that more people can surf at the same time.”*
 - *“Provide faster Internet connections.”*

E-Leadership

- Government received an average score of 2.3 (out of 5) for its efforts at making E-readiness a national priority. **Making the Internet accessible** (2.8 out of 5) was the most highly rated of the components. Conversely, dissatisfaction was highest with the lack of progress made **in automating governmental processes**.
- Interviewees cited the need for **several technological and legislative infrastructural developments, widespread public awareness and education campaigns and the development by government of an overall IT strategy for the country** as suggestions for improvement.

- “The infrastructure and framework both electronic and legislative must be in place first.”
- “Put an Internet strategy in place. Determine the role of the private and public sector. Use incentives to encourage participation.”
- “Develop a central information communications technology support unit to provide the required direction and support for the government service.”

Information Security

- For its efforts at implementing safe procedures to ensure that the processing and storage of networked information can be trusted, government received an overall rating of 2.4 (out of 5). The most poorly rated of the components in this area was the **dissemination of information to businesses on legislation related to IT and Internet usage** (1.9 out of 5).
- Suggestions for improvements included: **the updating and enforcing of current IT related legislation, using education/awareness campaigns to inform the public on issues related to electronic privacy, data protection and computer crimes and using a Government IT policing unit to audit and track compliance by organizations.**
 - “There is a need for more educational programmes, people are not yet aware of this (legislation).”
 - “There needs to be ongoing programmes to sensitize the public to issues related to intellectual property rights.”
 - “Establish something along the lines of overseas software protection agency - having the right to visit businesses to ensure that they are in compliance with the law.”
 - “Carry out government audits and work with the manufacturers of software to ensure that the country as a whole is made accountable.”
- Eighty-eight percent (88%) of interviewees indicated that there are security procedures in place at their organizations, and nearly all (97.8%) of the organizations have at least antivirus packages on their computer systems as a security measure.

Human Capital

- Results from the study indicate that overall Barbados has a moderately high-educated workforce. However, to ensure that e-business is properly implemented, the appropriate staff resources must be put in place to support and drive an e-society. Recognizing the increasing importance and the ubiquity of e-business, several companies indicated that they either currently provide or have plans to provide IT/Internet training opportunities for employees in the upcoming year.
 - Of those organizations interviewed, 42% had between 1%-10%, and 21% had between 11%-25% of employees with postgraduate qualifications.
 - With regard to IT training, 55% of employers, particularly those in the Private Sector and at Statutory Corporations had an IT trained workforce of at least 10%.
 - Three quarters (74%) offer IT based training, either in-house or external to their employees and an additional 13% will provide training in the future.

- Respondents in the business community identified a **lack of IT training/knowledge** (36% of mentions), **resistance to change** especially among the older segment of employees (18% of mentions) and **outdated management practices and attitudes** (5% of mentions) as the most significant workforce barriers to increasing Barbados' level of e-readiness.
 - *“Resistance to change due to lack of understanding by older members of work force.”*
 - *“People's attitude towards e-business e.g. those in the older generation are suspicious of computerization.”*
 - *“Resistance to change and inability to grasp technological advancement by the older workforce.”*

E-Business Climate

- The ease with which e-business is currently transacted in Barbados received an overall rating of 3.1 (out of 5). Of the five components, the **stability of Barbados' political system** (average of 4.2) was rated highest by respondents, with over 80% of respondents across the three organizational types indicating satisfaction.

- However, respondents' displeasure with the existing monopoly in the telecommunications market was reflected in the extremely low ratings given to the attribute, which measured the **competition among communication providers in Barbados**. Several respondents called for the deregulation of the telecommunications market. The average score of 1.7 (out of 5) suggests that interviewees recognize that the presence of an open, competitive IT environment would facilitate the growth and sustainability of e-commerce in Barbados.

Information Resources and Website Usage

- Having a presence on the Internet through the development and launch of websites is becoming a more common feature in the marketing and promotion effort of Barbadian businesses.
 - Just over 70% of organizations interviewed, particularly those in private sector currently have their own websites.
- The main reasons cited for the creation of websites were: (1) **for marketing and promotion of services/products offered**, (2) **cheaper alternative for dissemination of information**, (3) **easier way to increase visibility both regionally and internationally**, as well as (4) **a tool for the conduct of e-business**.
- Specific problems encountered while creating these websites included: **the gathering and management of the huge volumes of information from various disparate sources**, as well as **the high implementation costs associated with a project of this kind**.
 - *The ability to design it within Barbados at a reasonable cost. The local bandwidth is too slow and cost too high.*
 - *"Accumulating the information"*
 - *The cost was very prohibitive because at the time of development there were no in-house skills.*
 - *"The designers were external...not enough interaction between management and designers, thus design whilst informative has under achieved."*

- In addition, the maintenance of the websites, particularly in the area of timely updates seems to be an issue for some organizations.
 - Nearly 40% agreed that the information on their website is static.
 - Just under one half (47%) indicated that the website information is not frequently updated.
 - Three in ten admitted that the information on their website is neither current nor relevant.

Barriers to E-Business in Barbados

- **The high costs of implementing and developing the appropriate IT/telecommunications infrastructure, a lack of general understanding of the concept and benefits of e-business as well as a lack of skilled, trained resources in all areas relevant to the growth of e-business** have been identified as the three top impediments to the growth of the e-business sector in Barbados.
 - *“The cost of communication e.g. T1 and frame relay etc.”*
 - *“Ignorance among the general population about the Internet.”*
 - *“Absence of legislators who have the knowledge in e-commerce/IT law.”*
 - *“Lack of trained staff – both Government and Private Sector.”*
 - *“Limited trained human resource pool.”*

Ways to Improve State of E-Readiness

- Business respondents were asked to advise Government on ways it could improve Barbados' overall state of e-readiness. A range of suggestions were proposed, the foremost of which were: **the implementation of a wide-reaching e-readiness public education/awareness campaign, the provision of subsidies/incentives to the Private Sector to facilitate this process, the setting up of the appropriate IT and legislative infrastructure, and deregulation of the telecommunications sector.**

Summarized below are the key findings from the survey conducted with the general public/citizens of Barbados.

- Overall, the results indicate that Barbadians believe that Internet usage has had no significant negative impact on their lifestyles. Respondents generally agree that the medium is a valuable source of information, which saves them time and makes them feel more connected.
- Barbadians are using the Internet more for communicative purposes and for research-based activities. The primary online activity for Barbadian Internet users is Email/online chatting.
 - E-mails/online chatting was an activity in which 95% of the Internet users are engaged. Females, persons aged 18-34 and students report significantly higher usage of the Internet for this activity.
 - Conducting online research/information searches, with about 80% of the users, was ranked as the second most popular use of the Internet.
- However, Barbadian users are still cautious about using the Internet for online shopping.
 - Only one quarter (26%) of Internet users have shopped online in the past 12 months.
 - Books (52%), clothing/accessories (52%) and music/movies (48%) were the items most frequently purchased by online Barbadian shoppers, with over half of the Internet shoppers spending at least \$400 per year on their Internet purchases.

- The main reasons for not engaging in this practice included: **not owning a credit card** (33%), **Internet security concerns** (29%), **privacy concerns** (18%) and a **lack of interest** (9%).

- When asked about additional online activities they would engage in if they were made available, **the opportunity to register online for jobs** (76%), **registering online for courses/seminars** (75%), **requesting Government information online** (67%) and **making appointments with Government officials** (67%) appealed most to the respondents.

- Government needs to ensure that its websites are adequately publicized and marketed. **A lack of awareness of the existence of Government's websites** was the main reason cited by 64% respondents, especially females, for not visiting these websites:
 - Of those websites visited, The Barbados Labour Market website (www.labour.gov.bb) received the highest number of mentions, followed by GIS (www.bgis.gov.bb) and the Barbados Tourism Authority's website (www.barbados.org).

2.0 OBJECTIVES

The objective of the research exercise was to provide an overall assessment of Barbados' level of e-readiness.

Specifically, the study sought:

- To collect statistics on infrastructure indicators, such as personnel computer usages, telephone density, number of Servers dedicated to Internet use etc.
- To identify problems faced by the business community and the IT sector with respect to e-commerce development.

3.0 APPROACH AND METHODOLOGY

To achieve the above-stated objectives, both secondary and primary data were collected from the business community and citizens of Barbados. In the case of Government and the Commercial sector, an introductory letter was sent to all prospective interviewees explaining the purpose of the study and asking for their cooperation and participation. Subsequent follow-up calls were also made to ensure that the appropriate persons had received and reviewed the letter and that either (1) the relevant data were being collated or (2) that a date and time could be set for the conduct of a face-to-face or telephone interview.

Secondary Data Collection – Business Sector

- In total, six organizations were contacted and of these, three agreed to supply us with the available statistics they had on the infrastructural indicators.
- The data received are summarized in the Appendix, at the end of this report.

Primary Data Collection – Business Sector

- Letters were sent to a total of twenty six (26) Statutory Corporations, twenty one (21) Government Departments and one hundred (100) Private Sector Companies (32 small, 38 medium, 30 large).
- The listings of the Statutory Corporations and Government Departments was received from the Ministry of the Civil Service while the Business Directory of the Barbados Chamber of Commerce and Industry Website (<http://bdscham.com/>) was used to generate the lists of Private Sector Companies.
- At the end of the interviewing period, we obtained a total of ninety two (92) completes, with twenty (20) from Statutory Corporations, thirteen (13) from Government Departments, and fifty nine (59) from Private Sector Companies (22 small, 17 medium,

20 large). The list of organizations that were either interviewed or provided us with data is included in the Appendix, at the end of this report.

Primary Data Collection – General Public

- Telephone interviews were conducted with a random sample of two hundred and fifty eight (258) individuals. The sampling frame, for this portion of the study, was the 2002-2003 edition of the Barbados Telephone Directory.

3.1 Questionnaire Design

3.1.1 Commercial Sector

Two separate interviewing instruments were administered to the Business sector and to residential householders in the primary data collection phase.

The questionnaire used with the business respondents was designed based on research completed by McConnell International¹, a global technology policy and management consulting firm that specializes in improving the E-readiness of its clients.

McConnell International (MI) defines an **e-ready country** as “one that has extensive usage of computers in schools, businesses, government and homes; affordable reliable access in a competitive environment; free trade; skilled workforces and training in schools; a culture of creativity; government-business partnerships; transparency and stability in government and an evenly enforced legal system; secure networks and personal privacy; and regulations allowing digital signatures and encryption.”

In assessing the concept of e-readiness, MI proposes that the following five e-readiness attributes be examined:

- **Connectivity** - *Are networks easy and affordable to access and use?*
- **E-Leadership** - *Is E-Readiness a national priority?*
- **Information Security** – *Can the processing and storage of networked information be trusted?*
- **Human Capital** – *Are the right people available to support e-business and to build a knowledge-based society?*
- **E-business Climate** – *How easy is it to do e-business today?*

The questionnaire used in this study to guide respondents throughout the interview comprised of several closed-ended and open-ended questions, which addressed the five areas mentioned above.

¹ <http://www.mcconnellinternational.com>

In addition to these five (5) core topics, information was also sought from the business sector on their current uses of the Internet, their perception of the barriers/challenges as well as the opportunities facing the growth of the electronic commerce industry.

3.1.2 General Public

The questionnaire administered to the general public via the telephone focused on areas related to:

- Internet usage patterns
- Internet speed and connectivity
- Activities respondents currently engage in as well as activities they would be likely to engage in on the Internet
- Opinions/Perceptions of the influence of the Internet on their lives
- Awareness and use of Government's websites

3.2 Analytical Note

Several of the measures rated on the questionnaire (for the commercial sector) used the following scale:

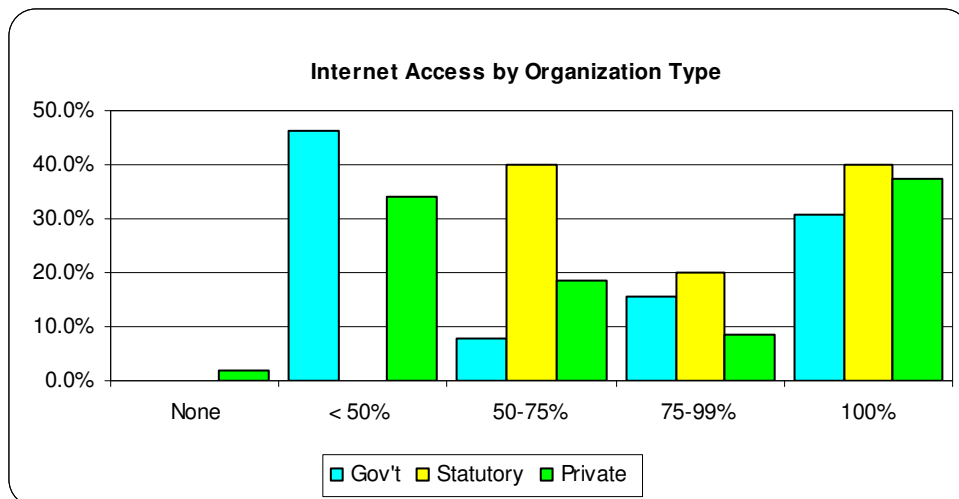
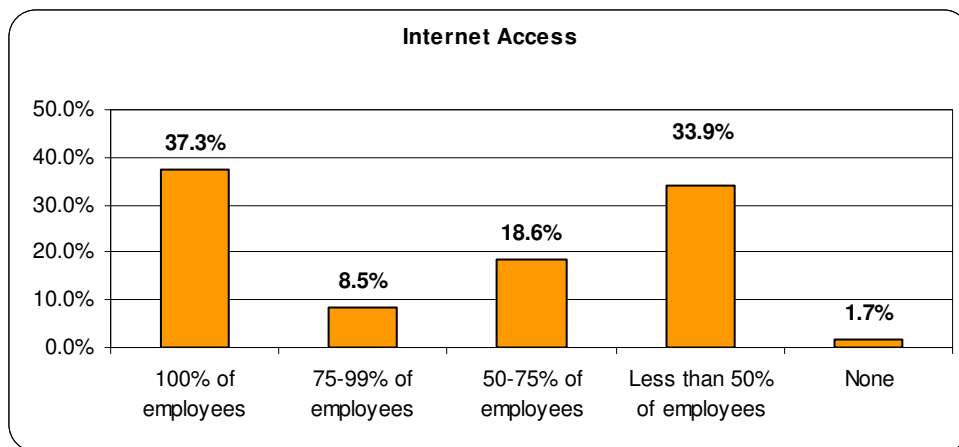
5 Excellent 4 Very Good 3 Fair 2 Poor 1 Very Poor

During the analysis these responses have been combined so that the ratings Excellent/Very Good are classified as being “*Positive*” assessments, while Poor/Very Poor are grouped as “*Negative*” assessments.

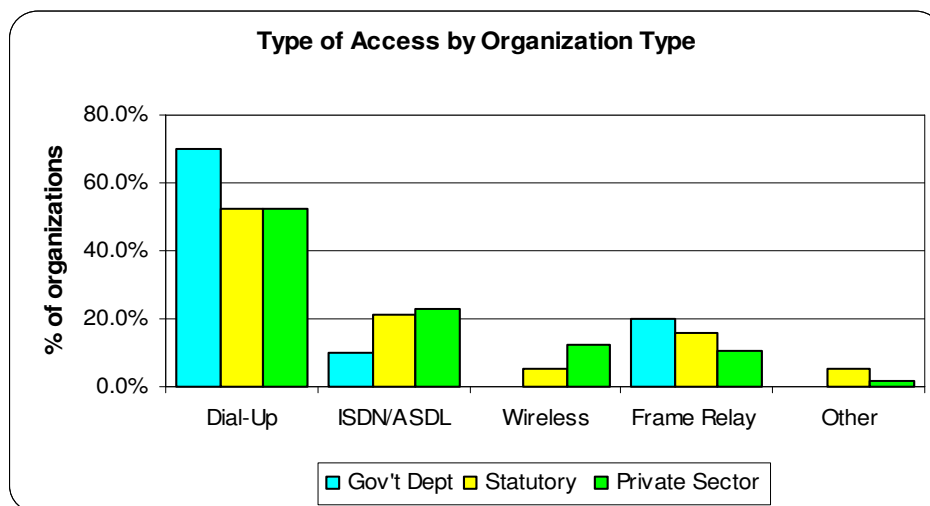
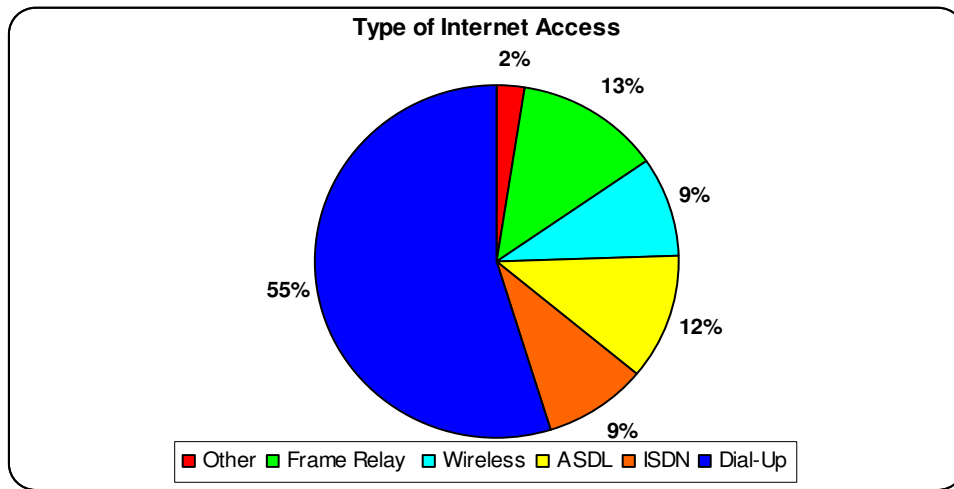
4.0 COMMERCIAL CUSTOMERS

4.1 Connectivity

Across the three organizational types, there were moderate levels of Internet accessibility. Overall, just under half (48.4%) of all the organizations interviewed indicated that at least 75% of their employees have access to the Internet. This was the case for 57.9% of the Statutory Corporations, 46.2% of Government Departments and 45.8% of the Private Sector Companies.

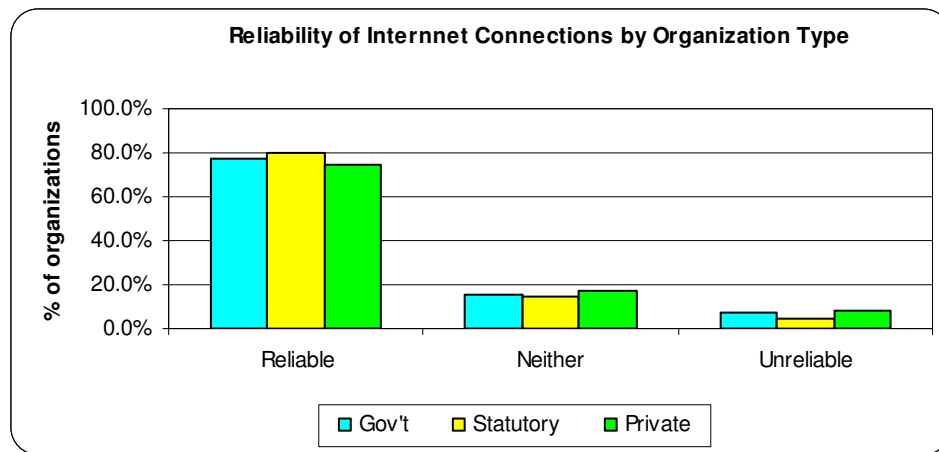


Using a 56K Dial-Up connection was given as the most popular way of accessing the Internet, particularly within Government where 70% of these departments were using this type of access. Similar proportions (52.6%) of the statutory corporations and private companies also use Dial-Up. However, employees primarily in Statutory Corporations and Private companies indicated use of higher speed Internet access options like ISDN/ASDL and Wireless.



4.1.1 Reliability

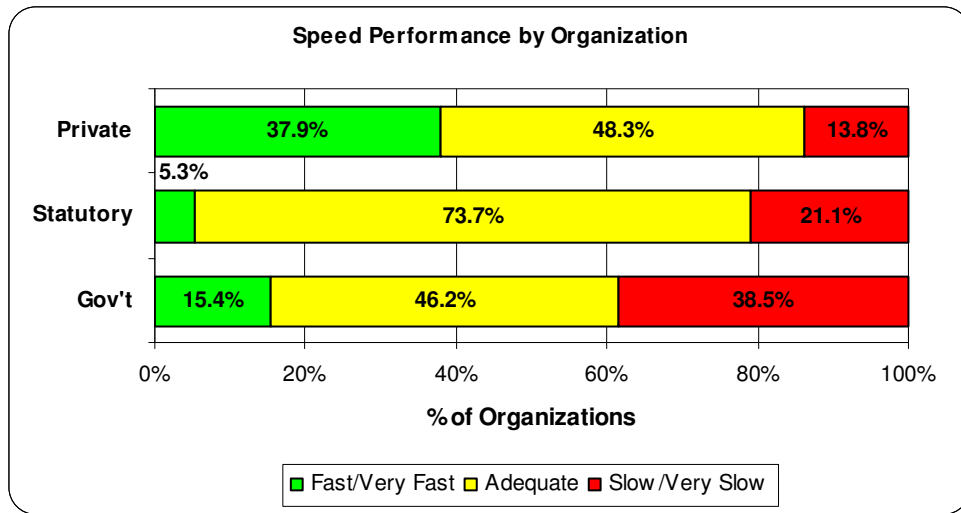
Overall respondents gave reasonably high ratings to the reliability of their Internet connections, with over three quarters (75.8%) of the organizations indicating that they seldom or never experience connection problems. There was no significant disparity across the three organizations type on this measure - 80% of Statutory Corporations, 77% of Government offices and 74% of Private companies.



4.1.2 Speed Performance

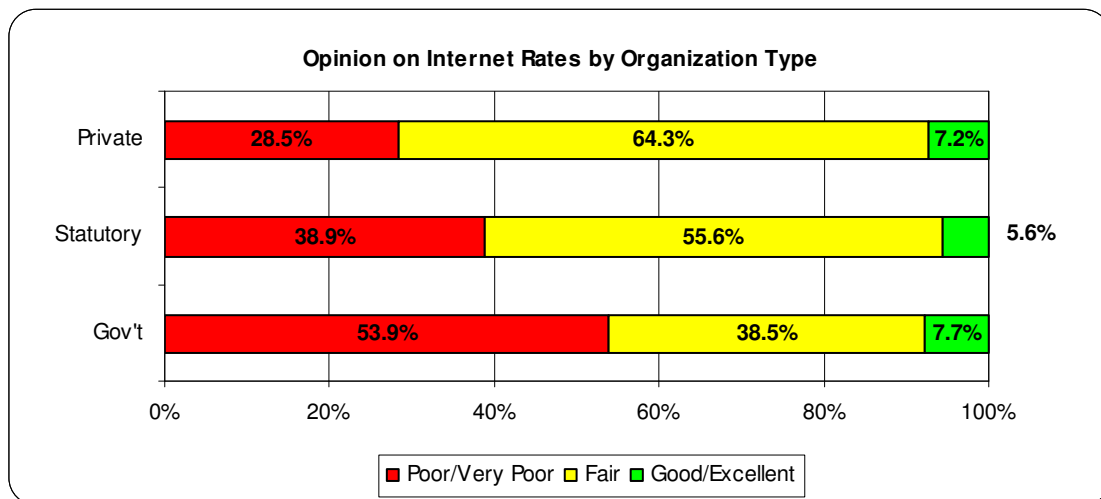
When asked about the speed performance of the Internet connection, less than one third (27.8%) of the persons interviewed considered theirs to be fast or very fast. The majority (53.3%) described the speed as being adequate while a smaller group (18.8%) felt their speed was slow/very slow. Private Sector organizations (37.9%) were nearly twice and over seven (7) times as likely as Government departments (15.4%) and statutory organizations (5.3%) respectively to have connections that can at least be described as fast.

Government Departments had significantly higher instances of slow/very slow Internet connections (38.5%) than the other two organizational categories.



4.1.3 Perception of Rates

The business sector was generally not in favour with the rates currently being charged to Internet users. Over one third (34.5%) of the interviewees felt that the rates were at most poor, while 58.6% felt the rates were fair. This pattern of responses was evident across all three types of organizations. However, displeasure with the rate structure was most likely encountered during the interviews with the representatives of Government departments.



4.1.4 Suggestions to Improve Accessibility/Reliability of Internet Connections

When asked for suggestions that could improve the accessibility/reliability of Internet connections, the overwhelming response given, across the three business types, was the ability to have **faster speeds of connection to the Internet**. The widespread introduction of services like ADSL, GSM mobile access and T1 lines were all made as recommendations. Over half (51.4%) of the responses included mention of this improvement to the current service.

A reduction in the current Internet rates especially on those for the higher speed connections was proposed in 35.6% of the responses. Other suggestions included an **improvement in the telecommunications technology** (18.4%) and the **opening up of the telecommunications sector to competition** (7.9%).

Below are some of the suggestions that were offered by the respondents:

Faster Access

- *“Increase bandwidth”*
- *“Make broadband more accessible and faster so that more people can surf at the same time.”*
- *“Provide faster Internet connections.”*
- *“Look aggressively at how to distribute greater bandwidth to households at an affordable rate...”*

Rate Reductions

- *“Make it more economical to make it accessible to more people...rates too high.”*
- *“Form a committee to negotiate for better prices thus being able to offer service at affordable rates to home users and the community.”*
- *“If rates are reduced then the Internet can be more readily available to everyone.”*
- *“Make pricing more attractive, high speed rates should be available to the regular person. ASDL is too expensive.”*

Deregulation

- *“Government should kill the telecommunications monopoly the competition would drive it.”*

4.2 E-Leadership

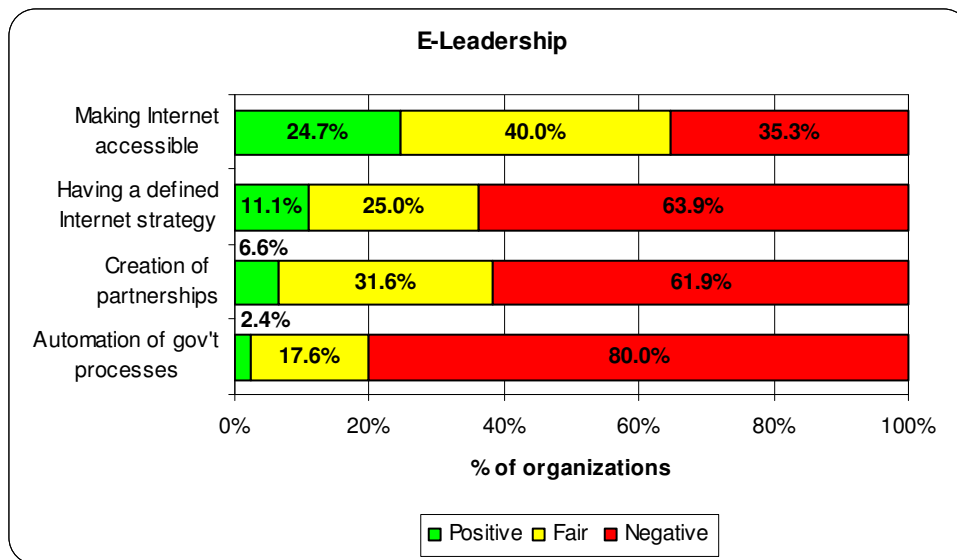
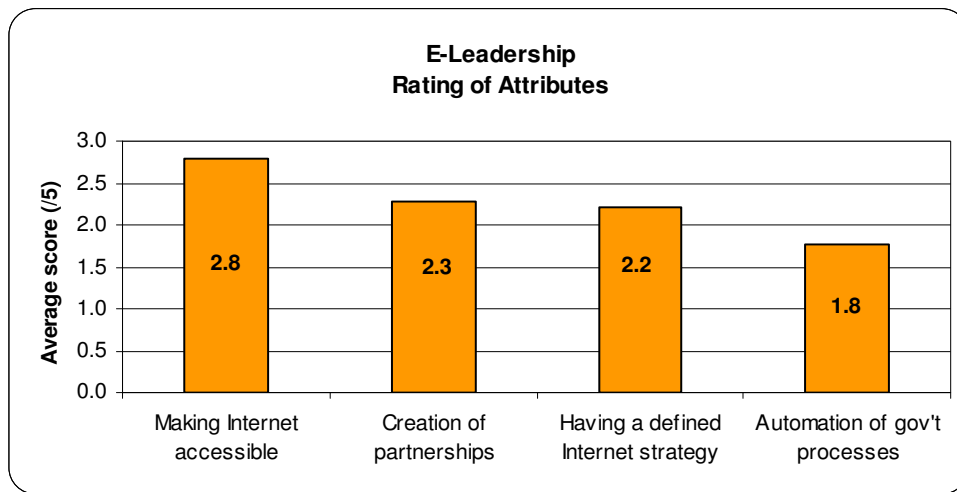
This section of the interview dealt with the issue of E-Leadership. Respondents were asked to rate the Government on its efforts at making E-readiness a national priority, namely in the areas of:

- Automation of governmental processes
- Creation of partnerships with the private sector to improve the state of e-readiness
- Making the Internet more accessible
- Having a defined Internet strategy/policy

A rating scale of one to five was used, where 1= Very Poor and 5 = Excellent was used.

Government’s efforts at E-Leadership received an overall rating of **2.3**. Representatives from Government departments, with an average rating of **2.0** were harshest in their assessment of Government efforts in this area. Statutory Corporations consistently gave the highest scores on all four of the measured attributes.

	Government	Statutory Corporations	Private Sector	Average
Making the Internet more accessible	2.3	3.3	2.8	2.8
Creation of partnerships with the private sector to improve the state of e-readiness	1.8	2.6	2.3	2.3
Having a defined Internet strategy/policy	1.8	2.4	2.2	2.2
Automation of governmental processes	1.9	1.9	1.7	1.8
Average	2.0	2.6	2.2	2.3



4.2.1 Making the Internet Accessible to Citizens

Government's attempts at making the **Internet accessible to all citizens** (average rating of 2.8) was rated highest across the three organizational groupings. One quarter (24.7%) of the respondents felt that the government was making a positive contribution in this area especially in light of the EDUTECH project, while a further 40% rated their efforts as fair.

Respondents were then asked for suggestions that Government can implement to ensure that the Internet is made more accessible. **A reduction in telecommunication rates** was the suggestion most often mentioned (30.4%) especially by the resource persons in Government Ministries and in the Private Sector.

Creating public Internet access areas like kiosks, Internet cafes etc. was recommended on 21.4% occasions, particularly by employees of Statutory Corporations.

Other suggestions to enhance the Internet accessibility included the granting of **concessions/incentives to buyers of computers and computer equipment** (17.9%) as well as a **further roll-out and expansion of the existing EDUTECH programme** (15.2%).

The categories of suggestions given as well as a sample of the respondents' verbatim comments are listed below.

E-LEADERSHIP			
Suggestions to Government to ensure that the Internet is made accessible to Barbados' citizens			
Category label	Count	Responses %	Cases %
Reduce telecom costs	34	30.4	43.0
Create public access areas	24	21.4	30.4
Concessions/Incentives	20	17.9	25.3
Education programmes/EDUTECH	17	15.2	21.5
Facilitate market competition	14	12.5	17.7
Form Partnerships/Alliances	3	2.7	3.8
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Total responses	112	100.0	141.8

Increase Public Access

- *“Provide Internet access at various public places e.g. libraries, clinics, and not only community centres.”*
- *“Place computers with access to Internet, and with the necessary security to prevent abuse, in places where the public frequents”*
- *“Increase work stations at libraries, community centres and Government-sponsored Internet cafés.”*
- *“Government can place Internet cafés or outlets for the general public who may not have PCs.”*
- *“This is not government’s responsibility but one thing government can do under its Social development programmes is to continue providing computers with access to the Internet within communities e.g. at community centres etc.”*

Concessions/Incentives

- *“...Increasing competition, making computer more accessible through the waiver of taxes...”*
- *“Government can reduce or totally eliminate any taxes being paid on the acquisition of hardware and subsidize the cost of accessing the Internet.”*
- *“Give concessions to private businesses to set up more Internet kiosks at strategic points for easy accessibility.”*

Education Programmes/EDUTECH

- *“EDUTECH programme should be implemented in all tertiary institutions...”*
- *“An extension of the EDUTECH programme...allow kids to access the Internet at home...”*
- *“Further develop the EDUTECH programme”*

Facilitate Market Competition

- *“Government should look at opening up the telecommunications market speedily to allow non-traditional providers into the market.”*
- *“Introduce more competition in the Internet arena – this would bring rates down.”*
- *“Allow more competitors to provide the service which would drive prices down allowing more people to afford this.”*
- *Open up telecom market to make access more affordable to the general public...at the same time address the regulation of rates and make them more compatible with International rates.”*

4.2.2 Creation of Partnerships with the Private Sector

With regard to the **creation of partnerships with the private sector** (average rating of 2.2), less than one tenth (6.6%) of the respondents lauded government’s efforts in this area, while just under one third (31.4%) gave a rating of fair. Over 90% of the respondents from government departments, 60% from the private sector and 46.7% from statutory corporations rated government’s performance in this area poorly.

To encourage the creation of these partnerships, respondents proposed that government should get more involved in forming **joint ventures with the private sector** (31% mentions), where the government can benefit from the technical expertise that exists within that sector.

Making IT related concessions and incentives available to the private sector (also with 31% mentions) was another suggestion, which was proposed mainly by the resource personnel at statutory corporations and in the private sector.

Representatives from the governments departments were of the opinion that **the formation of a separate IT body/committee utilizing resources from both sectors** (22.7% mentions) would be an effective means of encouraging dialogue and creating new partnerships.

Below is a summary of the other suggestions supplied by the interviewees.

E-LEADERSHIP			
<i>Suggestions for creating partnerships between the public and private sector to improve the state of e-readiness</i>			
Category label	Count	Responses %	Cases %
Joint Ventures	18	24.0	31.0
Concessions/Incentives	18	24.0	31.0
Formation of separate body	17	22.7	29.3
Having a defined IT policy	10	13.3	17.2
Training seminars	6	8.0	10.3
Committee	6	8.0	10.3
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Total responses	75	100.0	129.3

Some of the actual comments made included the following:

Incentives

- *“Put an Internet strategy in place. Determine the role of the private and public sector. Use incentives to encourage participation.”*
- *“Give incentives to the private sector to encourage alliances.”*
- *“Give private sector concessions to help put infrastructure in place and train people.”*
- *“Give the private sector business partners some sort of incentive e.g. an e-tax break or government subsidy.”*
- *“Grant concessions to the private sector to make e-business more attractive.”*

Joint Ventures

- *“Expertise lies within the private sector thus a need for greater joint ventures and training for persons employed by the Government.”*
- *“Joint ventures with the private sector e.g. between private sector and community college and/or UWI.”*

Joint Seminars/Forums

- *“Work more closely with private sector...have public forums and sessions to bring everyone together.”*
- *“Hold seminars with IT persons from both areas annually to get a flow of ideas.”*

New IT Body

- *“Create a board or committee to have the private sector particularly the big IT companies to develop procedures and policies to guide the process and foster this.”*
- *“Have discussions and develop plans to access help from the private sector. Put in place a special office to deal with this.”*
- *“Smart young private enterprise companies will be hesitant to get involved with government because of low and late payments. (Government should) create a statutory board, pre-fund it to deal with these types of projects so payment will be prompt. This will encourage the private sector to form these type of partnerships.”*
- *“Have more dialogue with the private sector. Government needs to put in place a separate body to work full time with the private sector to develop e-commerce platforms.”*

4.2.3 Automation of Government Processes

Of the four attributes measured in the area of E-Leadership, government’s attempt at **automating the government processes** (average rating of 1.8 out of 5) was the most poorly rated by the respondents. This opinion was consistently held across the three organization types - 83% of the interviewees from private sector companies, 77% from government departments and 72% from statutory corporations gave the performance a “below par” rating.

Several **infrastructural developments, in terms of the existing technology, facilities and legislations** were mentioned (22.5% mentions), as well as **the implementation of public awareness and education campaigns** (17.9% mentions), and the **development by government of an overall IT strategy for the country** (15.0% mentions).

Below is the breakdown of the responses received.

E-LEADERSHIP			
Suggestions to government on the promotion of the automation of governmental processes			
Category label	Count	Responses %	Cases %
Infrastructure	39	22.5	43.8
Communication/Education	31	17.9	34.8
Strategy/Allocate funds	26	15.0	29.2
Just Do It	23	13.3	25.8
Advise/Alliance	18	10.4	20.2
Training	14	8.1	15.7
Implement Legislation	7	4.0	7.9
Pilot Study/Research	4	2.3	4.5
Other	11	6.4	12.4
	-----	-----	-----
Total responses	173	100.0	194.4

Infrastructural Developments

- *“Ensure that government buildings are equipped with the physical infrastructure required to support the use of machinery required for such technology.”*
- *“The infrastructure and framework both electronic and legislative must be in place first.”*
- *“Government needs first to be able to accept credit card and debit card payments.”*
- *“Invest more heavily in technology and work connectivity between ministries.”*
- *“Put the infrastructure in place and ensure connectivity.”*

Education Campaign

- *“Educate the users of the systems and build confidence of employees who have to use the systems.”*
- *“Promote this through TV, workshops etc.”*
- *“..this will require some level of advertising and education through schools.”*
- *“Develop a central information communications technology support unit to provide the required direction and support for the government service.”*
- *“...have an education campaign to create awareness.”*
- *“Do more public awareness programmes to gain public trust.”*

Developing a Strategy

- *“Formulate a comprehensive national e-government policy and a strategy for realizing its objectives.”*
- *“Government needs a more comprehensive IT strategy*
- *“First develop a strategy and make it priority*
- *“Develop an IT strategy for the island as a whole.”*

Just Do It

- *“Adopt a just-do-it policy, just put it in place and over time usage will grow.”*
- *“Just Do It! Government just needs to pass one piece of legislation that states all payments to government must be paid electronically via a VAT ID.”*
- *“Numerous areas can already go online e.g. renewing car licenses etc.”*

Advice/Alliances

- *“Engage international consultants to investigate and provide framework in this regard.”*
- *“Speak to BEC and Barbados Chamber of Commerce to find what would be most effective systems for government to introduce.”*
- *“Work with banks so that citizens can make credit card payments directly to banks.”*
- *“Government needs to first establish someone whose responsibility is to lead a team to look at technology as a whole – a true CIO who understand technology, trends to write policy and advise them.”*
- *“Work in conjunction with the business partners to get equipment at an affordable rate so as to put systems in place.”*

4.3 Information Security

The next component of e-readiness dealt with was that of information security. Respondents were asked to:

1. Rate Government on its efforts at implanting legislation and ensuring that the appropriate data protections laws are in place, in the areas of:
 - Strength of legal framework to address computer crimes
 - Strength of legal framework to prosecute computer crimes
 - Progress in the protection of intellectual property rights
 - Efforts to protect electronic privacy
 - Dissemination of legislation related to IT usage

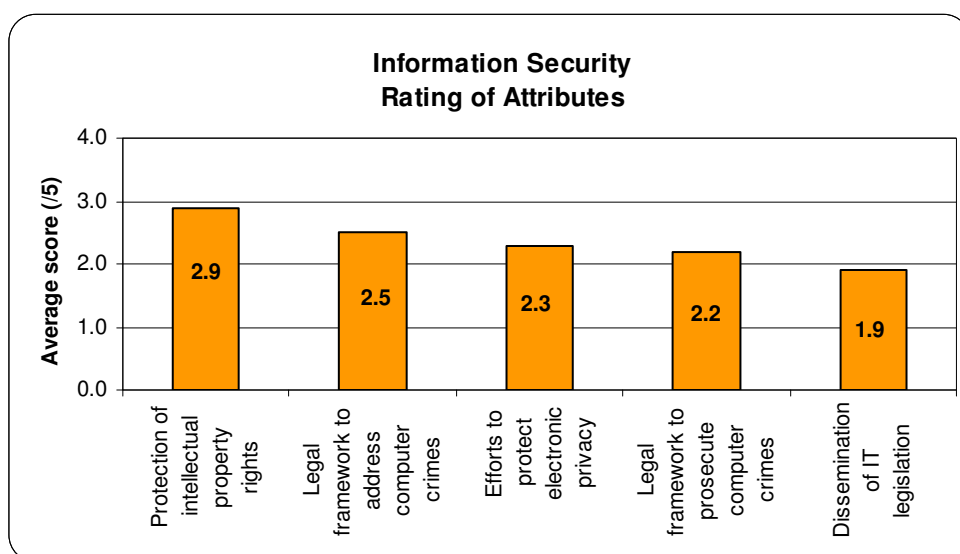
Again, a rating scale of one to five was used, where 1= Very Poor and 5 = Excellent was used.

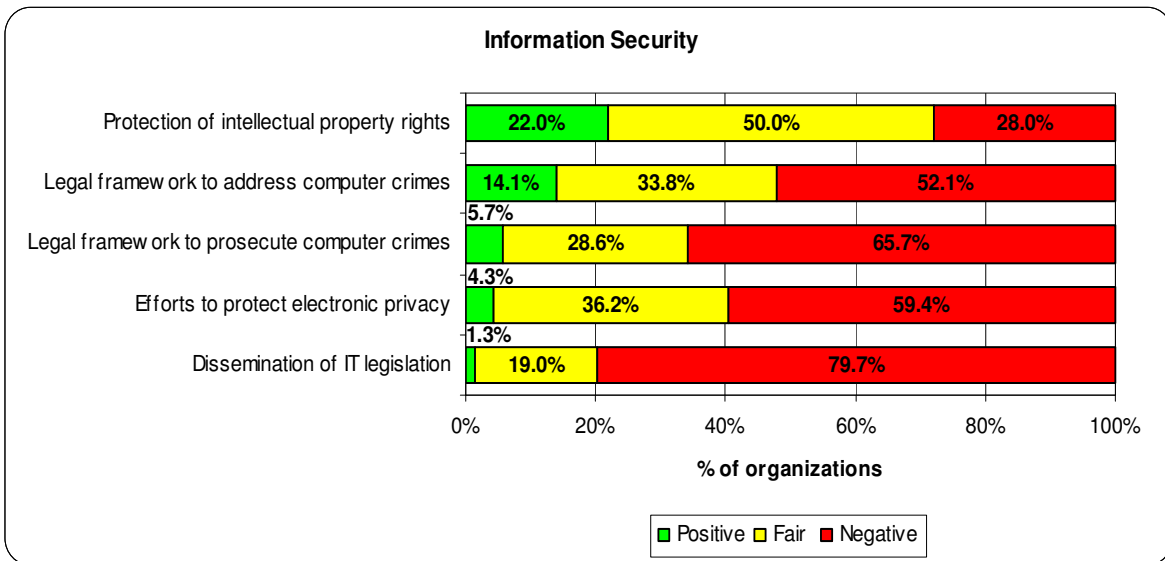
2. Describe the information security measures they currently have in place at their respective organizations

Government's response to issues related to the security and protection of electronic information received an overall rating of **2.4**. This e-readiness feature received its highest ratings from Government department officials (average of **2.7**) followed by those from Statutory Corporations (average of **2.3**) and the Private Sector (average of **2.2**). With the exception of the rating of government in the **area of the protection of electronic privacy**, this pattern of response was consistent across the other information security attributes.

The progress made in **the protection of intellectual property rights** had an overall score of 2.9 (out of 5) with about two in every ten respondents (22.0%) expressing satisfaction with this area. On the other hand, very few respondents praised **government's efforts at disseminating information related to the IT and Internet usage** (average score of 1.9), with only 1.3% of the respondents providing a positive assessment.

	Government	Statutory Corporations	Private Sector	Average
Protection of intellectual property rights	3.0	2.9	2.8	2.9
Legal framework to address computer crimes	3.0	2.5	2.3	2.5
Efforts to protect electronic privacy	2.2	2.2	2.3	2.3
Legal framework to prosecute computer crimes	2.8	2.2	2.0	2.2
Dissemination of information related to IT and Internet usage	2.4	1.8	1.8	1.9
Average	2.7	2.3	2.2	2.4





4.3.1 Protection of intellectual property rights

Of the five elements measured in the area of information security, the progress made in the **protection of intellectual property rights was rated highest**, (average rating of 2.9), with 72% of respondents providing a rating of good or fair.

Suggestions to ensure the continued development of this area included **the use of a public awareness or education campaign to inform both the users and the developers of the technology of their rights and responsibilities** (26.6% of mentions). This was the top suggestion from representatives of Government Departments and Statutory Corporations.

Interviewees primarily from the Private Sector were of the opinion that **the enforcement of the existing laws and legislation** would be also effective measure (26.6% of mentions). Another popular recommendation was **the use of periodic audit checks by the appropriate government unit** to ensure adherence by organizations to the laws governing intellectual property rights.

These and other suggestions made are summarized below.

INFORMATION SECURITY			
<i>Progress in the protection of intellectual property rights</i>			
Category label	Count	Responses %	Cases %
Education/Public Awareness	21	26.6	37.5
Law Enforcement	17	21.5	30.4
Auditing/Tracking	11	13.9	19.6
Licensing of Software	8	10.1	14.3
International expertise	7	8.9	12.5
Strengthening of legislation	6	7.6	10.7
Continue w/ current job	5	6.3	8.9
Other	4	5.1	7.1
	-----	-----	-----
Total responses	79	100.0	141.1

Education/Public Awareness

- *“There is a need for more educational programmes, people are not yet aware of this.”*
- *“Software developers must be made aware of their rights.”*
- *“There needs to be ongoing programmes to sensitize the public to issues related to intellectual property rights.”*
- *“Disseminate information through conferences and seminars so people can know they have legal recourse.”*
- *“The legislation for intellectual property is already in place - the public must be educated in the valuation and protection techniques relating to intellectual property.”*

Law Enforcement

- *“Need to publicize crimes and enforce laws and penalties.”*
- *“Putting the appropriate legislation in place and enforcing it.”*
- *“Enforce the international copyright laws and have a mechanism to police this.”*

Auditing/Tracking

- *“Establish something along the lines of overseas software protection agency - having the right to visit businesses to ensure that they are in compliance with the law.”*
- *“Carry out government audits and work with the manufacturers of software to ensure that the country as a whole is made accountable.”*
- *“Have a unit that monitors business include video shops - need to police it.”*
- *“Work with data processing department along with Cyber Law Enforcement Unit to do Inventory checks.”*

Licensing of Software

- *“A number of companies still breach the rules by using software that is not licensed.”*
- *“Encourage all software users to purchase only legal copies.”*
- *“We can ensure that we have the correct licenses.”*
- *“Ensure that companies register the software they are using.”*

4.3.2 Legal Framework to Address Computer Crimes

This component of information security was given an average score of **2.5** (out of 5), with just under half (47.9%) of the interviewees indicating that government has done a fair job of establishing and promoting this area. To further improve and build on the work already started, several suggestions were proposed. The foremost of these, across the three organizational types, was the **updating and enforcing of the legislation** that already addresses this area (32.9% of mentions). This was followed buy the suggestion to **engage and utilize persons/agencies with specialized legal knowledge** to ensure that the legislation takes into account all relevant situations pertaining to e-crimes (18.3% of mentions). The **use of a public education/awareness campaign** (14.6% of mentions) to highlight this area as well as **studying how other countries dealt with this area** (13.4% of mentions) were the other major recommendations to government.

Below is a summary of these suggestions.

INFORMATION SECURITY			
<i>Strength of legal framework to address computer crimes</i>			
Category label	Count	Responses %	Cases %
Update/Enforce legislation	27	32.9	43.5
Specialized expertise/Resources	15	18.3	24.2
Public Awareness/Education	12	14.6	19.4
Case studies/Best practices	11	13.4	17.7
Work with police/IT enforcement org	7	8.5	11.3
Stiffer penalties	4	4.9	6.5
Definition	3	3.7	4.8
Other	3	3.7	4.8
	-----	-----	-----
Total responses	82	100.0	132.3

Update/Enforce Legislation

- *“Strengthen existing legislation and ensure when such crimes take place that prosecution is done to the full extent of the law.”*
- *“Must put the appropriate legislation in place and ensure that it is enforced.”*
- *“Put legal frame work in place, educate the public about it and then enforce it.”*
- *“Draft or update existing laws and enforce same.”*
- *“Work with the private sector to develop, implement and enforce legislation.”*
- *“Strengthen existing legislation and ensure when such crimes take place that prosecution is done to the full extent of the law.”*

Engage Specialized Expertise/Resources

- *“Have individuals knowledgeable in this area e.g. legal people with the training who can analyse and deal with the issues that come out of this area.”*
- *“Need to acquire the appropriate expertise to deal with this.”*
- *“Hire the experts and look to more developed countries to get help and advise in this area.”*
- *“Use experts from both public & private sector and also foreign experts to draft this type of legislation.”*

Public Awareness/Education

- *“Need to educate public about the dangers associate with electronic crime.”*
- *“Educate the people who will monitor this area so that they are knowledgeable enough to solve a crime.”*
- *“Promoting awareness through TV shows, newspaper articles.”*
- *“Government needs to put the framework in place - if it is there they should publicize.”*

Case Studies/Best Practices

- *“Research jurisdictions where this is functioning and adapt to our society.”*
- *“Adapt and apply what is done in North America to our environment.”*
- *“Study what more developed countries have done in this area and adapt to our environment.”*

Work with Police/IT Enforcement Organization

- *“Once legislation is in place then have a policing unit of trained IT personnel to address computer crimes.”*
- *“Work closely with the police to enforce legislation when enacted”*

4.3.3 Legal Framework to Prosecute Computer Crimes

With regard to the prosecution of computer crimes, only one third (34%) of those interviewed gave a positive or fair rating to the framework that is currently in place to handle incidents of this kind. Interviewees from the Private Sector (73.9%) and Statutory Corporations (71.4%) were far more likely to give positive evaluations than their counterparts from government departments (20%).

The consensus, among respondents, was that the **update and proper enforcement of the current legislation** (33.3% of mentions) as well as an ongoing **effort by an appropriate law enforcement unit** (25.4% of mentions) to police organizations and investigate cases of computer crime would improve this area.

Other suggestions included **using a public education campaign to increase awareness of what constitutes computer crimes and the associated penalties** (9.5% of mentions), **training of workers on the issues related to e-crimes** (9.5% of mentions), **the implementation of stiffer penalties for offenders** (7.9% of mentions), **learning from and where appropriate putting into practice what other countries have done** (6.3% of mentions) and **engaging the services of specially trained legal and IT experts in the area of the prosecution of computer crimes** (4.8% of mentions).

A breakdown of the responses received is given below.

INFORMATION SECURITY			
<i>Strength of legal framework to prosecute computer crimes</i>			
Category label	Count	Responses %	Cases %
Update/Enforce legislation	21	33.3	42.0
Work with police/IT enforcement org	16	25.4	32.0
Public Awareness/Education	6	9.5	12.0
Training	6	9.5	12.0
Stiffer penalties	5	7.9	10.0
Case studies/best practices	4	6.3	8.0
Specialized expertise/resources	3	4.8	6.0
Other	2	3.2	4.0
	-----	-----	-----
Total responses	63	100.0	126.0

Update/Enforce legislation

- *“The government needs to start using legislation - enforcing laws and make examples.”*
- *“Revisit the legislation with a view to setting it to 2 years ahead to the actual implementation of the legislation.”*
- *“Appropriate legislation needs to be brought up to date.”*

Work with Police/IT Enforcement Organization

- *“Have a separate body to deal with this rather than depend on the existing courts.”*
- *“Implement a security unit to deal with IT issues e.g. within the police force.”*
- *“There is a need to have systems set in place with a unit of trained personnel to enforce the law.”*
- *“Create a special unit in the justice system to do this.”*
- *“Need to have a special unit within the police force to deal with this.”*
- *“A specialized unit with its own investigation, prosecution and power.”*
- *“Set up a department to monitor this and keep abreast of the changes to ensure that one can get the appropriate legislation to be done in a much more timely manner.”*

Case Studies/Best Practices

- *“Government needs to be guided by other countries who already have systems in place and adapt to this environment.”*
- *“Have workshops where you examine test cases and the results of test cases.”*

4.3.4 Efforts to Protect against Electronic Privacy

About 60% of the respondents gave government a “below par” rating for their performance in this area. Two thirds (66.7%) of these negative scores came from Statutory Corporations, 63.7% from Government Departments and 55.8% of interviewees from the Private Sector.

The principal suggestions for improvements in this area included the **enactment and enforcement of the existing legislation** related to e-privacy (26.3% of comments), a continued **effort to educate and increase the public’s awareness of issues related to e-privacy** (26.3% of comments) and the **setting up of a special committee to address and educate on issues related to e-privacy** (18.4% of mentions).

INFORMATION SECURITY			
<i>Efforts to protect against electronic privacy</i>			
Category label	Count	Responses %	Cases %
Enacting/Enforcing legislation	10	26.3	28.6
Public Education	10	26.3	28.6
Setting up of a new committee	7	18.4	20.0
Security policies	4	10.5	11.4
Adopt best practices	3	7.9	8.6
Other	4	10.5	11.4
Total responses	38	100.00	108.6

Enacting/Enforcing legislation

- *“Enact and enforce the data protection act with an appropriate well resourced and staff.”*
- *“Enact and enforce relevant laws.”*
- *“Strengthen the legislation - enforce this.”*
- *“Enactment of legislation”*

Public Education

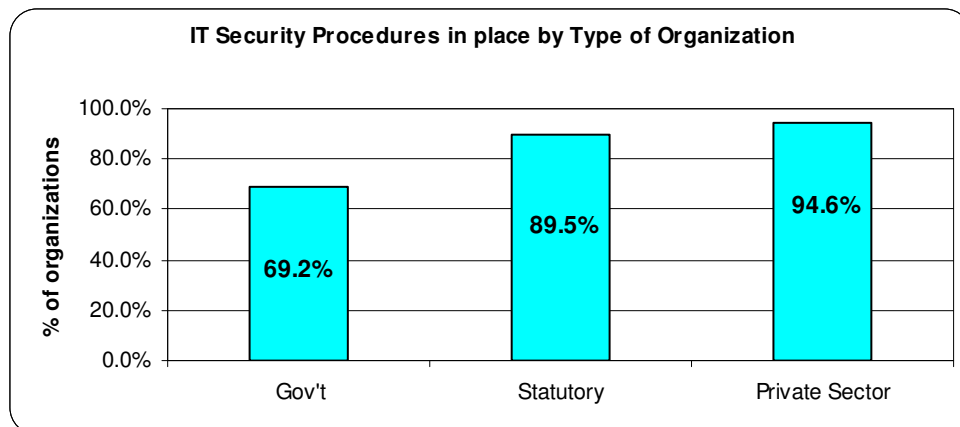
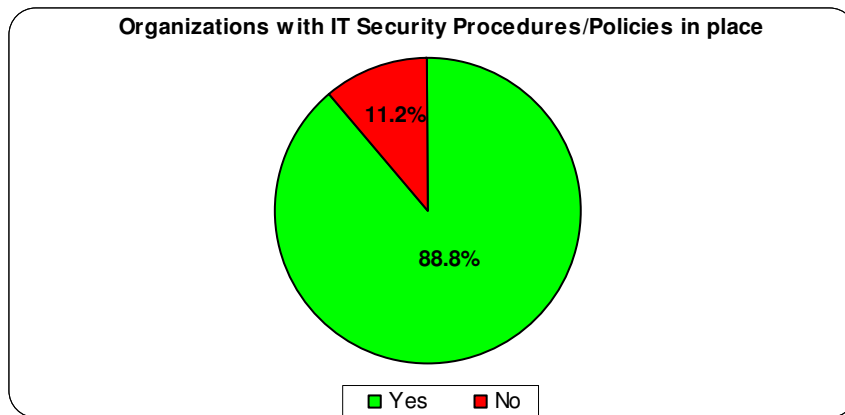
- *“People need to be sensitized on the whole question relating to security on the Internet.”*
- *“Education of public about their rights and the mechanisms that can be used to keep their information private*
- *“Government needs to have an educational forum to deal with this.”*

Set Up Committee

- *“Set up a standing committee to address this.”*
- *“Set up organization to monitor this and also educate the public.”*
- *“Allocate the responsibility to a unit to deal with this or maybe a department within a larger unit.”*
- *“Need a watchdog agency to monitor any incident and follow-up and prosecute.”*
- *“Set up task force to deal with this.”*

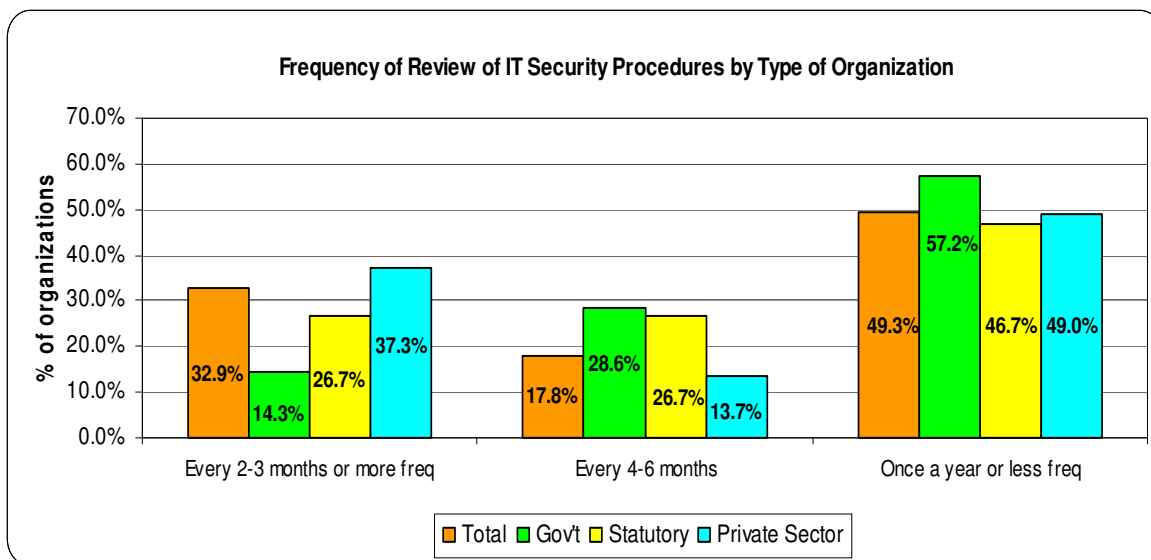
4.3.5 IT Security Procedures

The vast majority (88%) of interviewees indicated that there are security procedures in place at their organizations. This incidence was significantly higher among Private Sector companies (94.6%) and Statutory Corporations (89.5%) as compared with Government Departments (69.2%).



4.3.5.1 Frequency Of Review Of Security Procedures

Overall, respondents indicated that one third (32.9%) of their reviews were conducted at least every 2-3 months, 17.8% every 4-6 months, with 49.3% of reviews being conducted at most once a year. The Private Sector led the way – 37.3% of their reviews were conducted at least every 2-3 months, compared with 26.7% for Statutory Corporations and 14.3% for Government Departments.



4.3.5.2 Type of Internet Security Software

Nearly all (97.8%) of the organizations at least have **antivirus packages** on their computer systems as a security measure. The next most commonly used measure were **firewalls** (66.3% of organizations), followed by **authentication routines** (62.9%) and **security administrations systems** (61.8%). **Encryption technology** techniques (6.9%) were significantly more predominant in the Private Sector organizations than in Government or Statutory organizations.

Over two thirds of the sample (67.4%) had at least three of these security measures in place in their organizations.

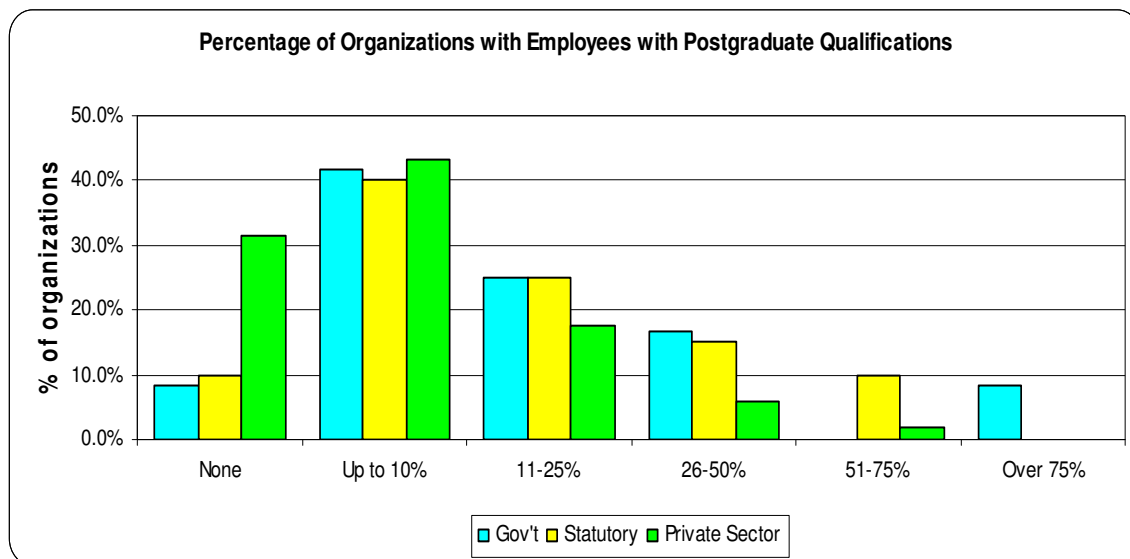
Type of Internet Security Software	% of organizations
Antivirus packages	97.8%
Firewalls	66.3%
Authentication Routines	62.9%
Security Administration Systems	61.8%
Encryption Technology	21.3%
None	1.1%

4.4 Human Capital

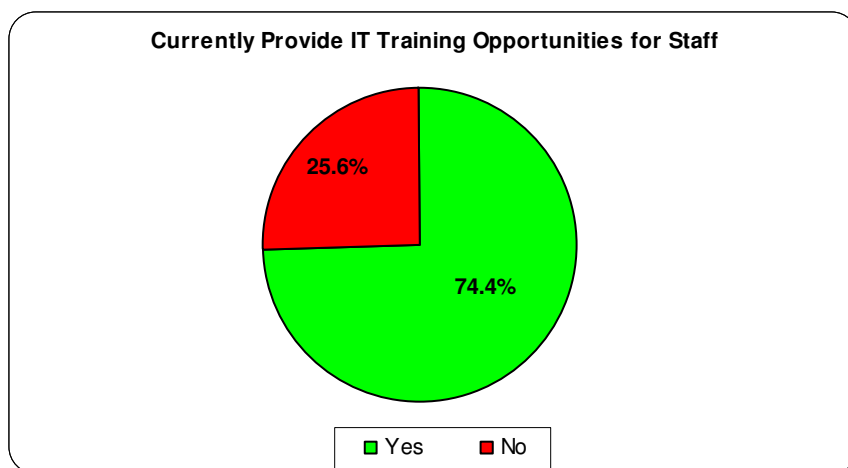
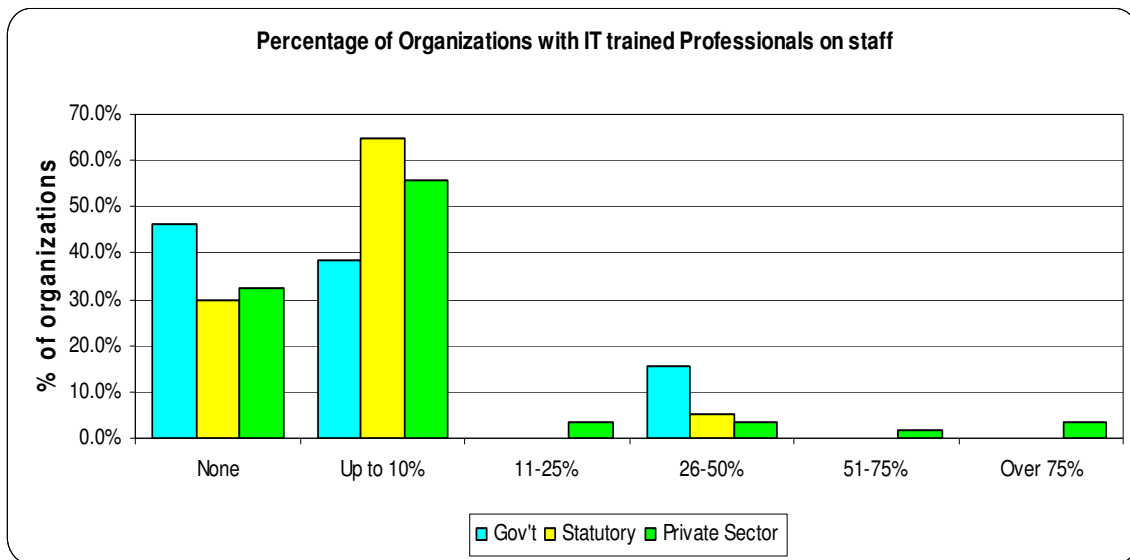
This section of the questionnaire dealt with the training and IT investment that businesses have made and will continue to make in its employees. These measures will ensure that the right people are available to support e-business and build Barbados as a knowledge-based society.

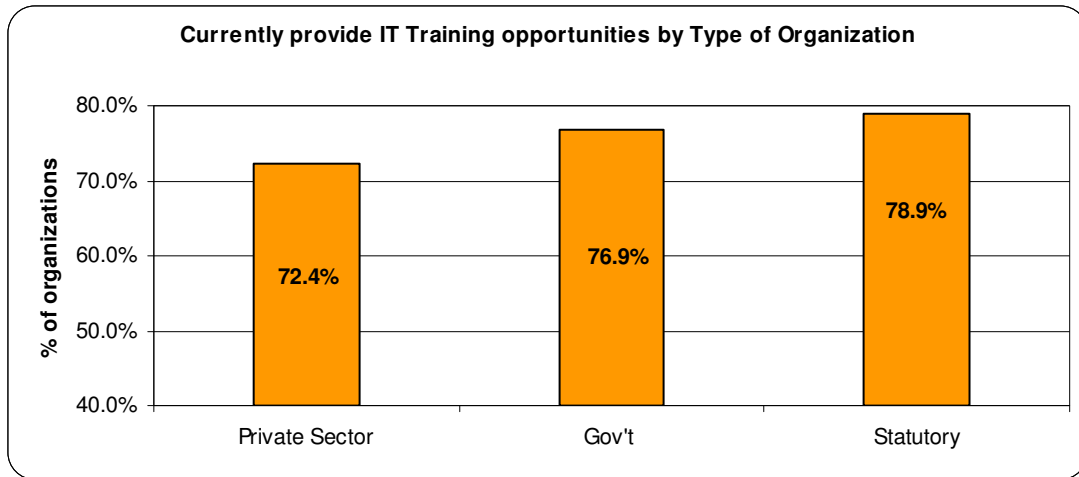
In keeping with Barbados’ overall emphasis on education, it is therefore not surprising that these results indicate that we have a moderately high-educated workforce. Of those organizations interviewed, 42% had between 1%-10%, and 21% between 11%-25% of employees with postgraduate qualifications.

Although they were 31.4% of Private Sector organizations with no employees with Postgraduate qualifications, two thirds (66.7%) of these were small businesses (less than 25% employees) and 22.2% had between 26-100 employees.



In addition, several companies indicated that they either currently provide or have plans to provide IT/Internet training opportunities for employees in the upcoming year. Fifty five percent of employers, particularly those in the Private Sector and in Statutory Corporations had an IT trained workforce of at least 10%. Overall, three quarters (74%) offer IT based training, either in-house or externally to their employees and an additional 13% intend to provide training in the future.





4.4.1 Workforce Barriers to Increasing Level of E-readiness in Barbados

When asked to identify the most significant workforce barriers to increasing Barbados’ level of e-readiness, respondents in the business community named a **lack of IT training/knowledge** (36% of mentions), **resistance to change** especially among the older segment of employees (18% of mentions) and **management practices and attitudes** (15% of mentions) as the top three obstacles.

HUMAN CAPITAL			
<i>What do you consider to be the most significant workforce barriers to increasing the level of e-readiness of Barbados?</i>			
Category label	Count	Responses	Cases
Lack of training/IT knowledge	32	36.4	40.0
Resistance to change	16	18.2	20.0
Management Attitudes	13	14.8	16.3
Mistrust/Fear of technology	9	10.2	11.3
Financial constraints	6	6.8	7.5
Time Constraints	5	5.7	6.3
Unwillingness to accept tech	3	3.4	3.8
Educational system	2	2.3	2.5
Other	2	2.3	2.5
Total responses	88	100.0	110.0

Lack of IT Training/Knowledge

- *“Lack of sufficiently structured training programmes to allow for planned incremental growth in IT capacity.”*
- *“General lack of basic IT proficiency.”*
- *“Lack of trained and qualified personnel in this area.”*
- *“Lack of knowledge and understanding of the whole e-business process.”*

Resistance to Change

- *“Resistance to change sometimes at the senior level.”*
- *“Resistance to change due to lack of understanding by older members of work force.”*
- *“Resistance to change and inability to grasp technological advancement by the older workforce.”*
- *“Resistance to change at the level of management and older members of the workforce.”*
- *“The human element - resistance to change.”*

Management Practices and Attitudes

- *“Management's reluctance to release staff for training.”*
- *“Restrictions placed on certain members of the workforce can curb enthusiasm to gain knowledge in this area.”*
- *“Some administrators and managers resist use of computers.”*
- *“The major barriers are in the leadership of organizations.”*
- *“Management's attitude to technology in many instances.”*
- *“Lack of management commitment.”*
- *“Executive management not seeing the need for technological advancement.”*
- *“Some managers' reluctance to giving employees access to the Internet.”*

4.5 E-Business Climate

The evaluation of the E-business climate and the ease with which e-business takes place in Barbados was assessed in 5 key areas, namely the:

- Existence of competition among communication providers in Barbados
- Existence of competition among Internet Service Providers (ISPs) in Barbados
- Strength of Barbados' economy
- Stability of Barbados' political system
- Ability of Barbados' financial system to support electronic commerce.

The respondents were asked to assign a score to each of the above-mentioned areas using a scale of 1 to 5 with 1 = Very Poor and 5 = Excellent.

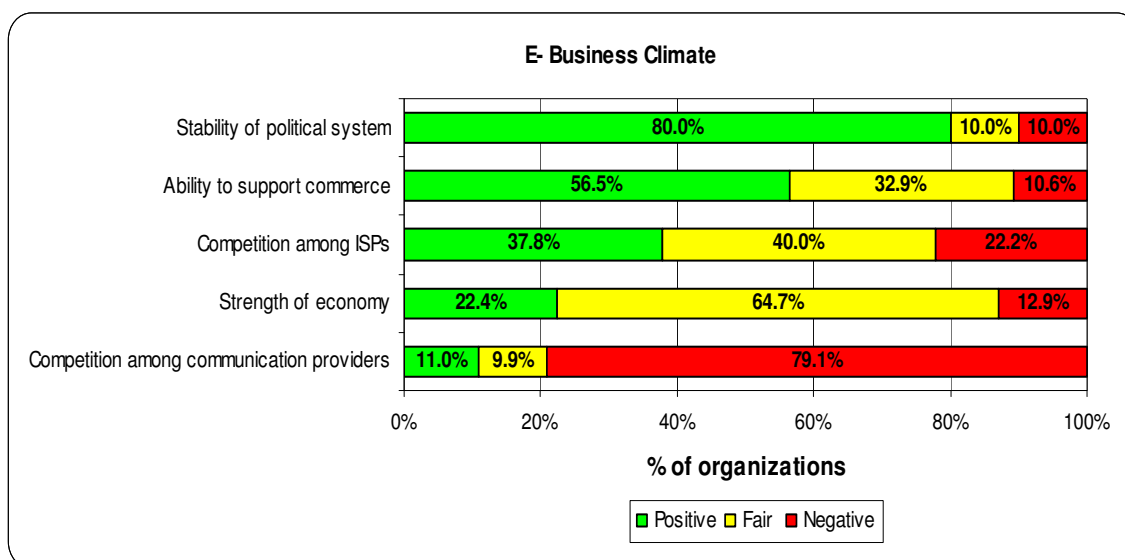
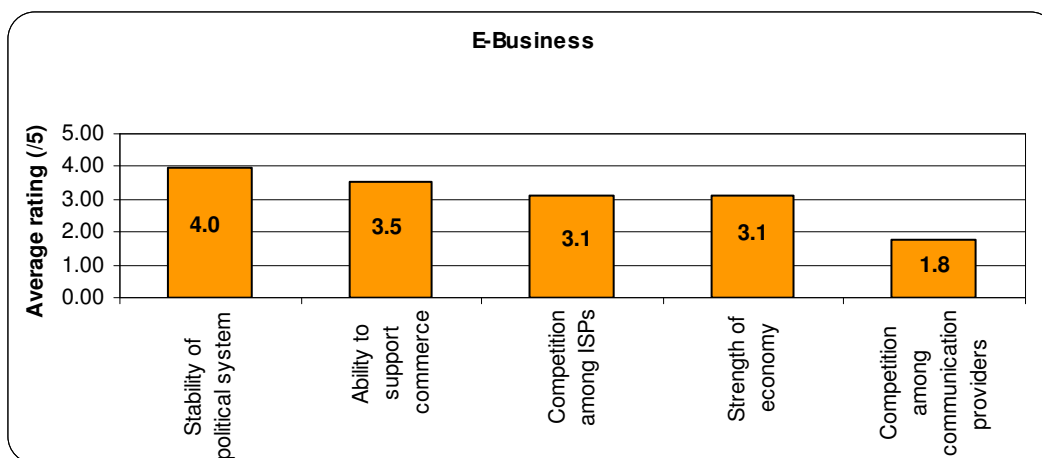
Overall, the e-business climate received an average score of 3.1 (out of 5), suggesting that the majority of respondents believe that the current system is adequate but a concerted effort is still needed to further strengthen and develop the e-business sector.

The stability of Barbados' political system (average of 4.2) was rated highest by respondents, with over 80% of respondents across the three organizational types indicating satisfaction. Just over half of the respondents (56.5%) indicated satisfaction with **the ability of Barbados' financial system to support e-commerce**.

The competition existing among ISPs (like Sunbeach/Cariaccess, Caribsurf etc.) and **the strength of Barbados' economy** were each rated by the interviewees with a passable average score of 3.1.

Displeasure with the existing monopoly in the telecommunications market was reflected in the extremely low ratings given to the attribute, which measured **the competition among communication providers in Barbados**. The average score of 1.7 (out of 5) suggests that interviewees recognize that the presence of an open, competitive IT environment would facilitate the growth and sustainability of e-commerce in Barbados.

	Government	Statutory Corporations	Private Sector	Average
Stability of political system	3.7	4.4	4.3	4.2
Ability to support e-commerce	3.5	3.7	3.6	3.6
Competition among ISPs	3.2	3.1	2.8	3.0
Strength of economy	3.1	3.3	2.9	3.1
Competition among communication providers	1.8	1.8	1.7	1.8
Average	3.1	3.3	3.1	3.1



4.6 Information Resources and Website Usage

Only 17% of organizations indicated that they **had libraries equipped with Internet access for employees**. Of these, one third (33.3%) were Government departments, 20% were Statutory Corporations and 12.5% were Private Sector companies.

On the other hand, **having a company/department website** was far more popular among Barbadian organizations. Just over 70% of the organizations interviewed, (74.6% within the Private Sector, 65% within Statutory Corporations and 60% within Government Departments) have their own websites.

The reasons given for the creation of websites included: (1) **for marketing and promotion of services/products offered** (34% of mentions), (2) **cheaper alternative for dissemination of information** (29% of mentions), (3) **easier way to increase visibility both regionally and internationally** (8% of mentions), as well as (4) **a tool for the conduct of e-business** (8% of mentions).

INFORMATION SECURITY & WEBSITE USAGE			
<i>Why did management see the need to create a website</i>			
Category label	Count	Responses %	Cases %
Marketing/Promotion of products/services	30	33.7	47.6
Make Information Accessible	26	29.2	41.3
Attract regional/international customers	7	7.9	11.1
Conduct E-business	7	7.9	11.1
Communication Tool	5	5.6	7.9
Staying abreast with tech	5	5.6	7.9
Increase visibility	3	3.4	4.8
Parent Company Requirement	3	3.4	4.8
Improve customer/client relations	2	2.2	3.2
Other	1	1.1	1.6
	-----	-----	-----
Total responses	89	100.0	141.3

Thirty percent of the organizations admitted experiencing difficulties during the website design phase. In 50% of these cases, the most problematic phase proved to be the **collection and management of the huge volumes of data**. Other difficulties encountered included: **the high project costs** (23% of responses), **the assignment of the project to persons who were not adequately trained and skilled in website design** (18% of responses) **the lengthy time commitment involved** (9% of responses).

- *The ability to design it within Barbados at a reasonable cost. The local bandwidth is too slow and cost too high.*
- *“Accumulating the information”*
- *The cost was very prohibitive because at the time of development there were no in-house skills.*
- *“Creating the rating engine and the transfer of the information from the data base of the website to the actual application that runs the company.”*
- *“Lack of manpower and budgeted money to carry out mandate.”*
- *“The persons hired to create this did not have enough experience.”*
- *“The gathering of information was difficult in relation to time we had.”*
- *“Being able to allocate enough management time.”*

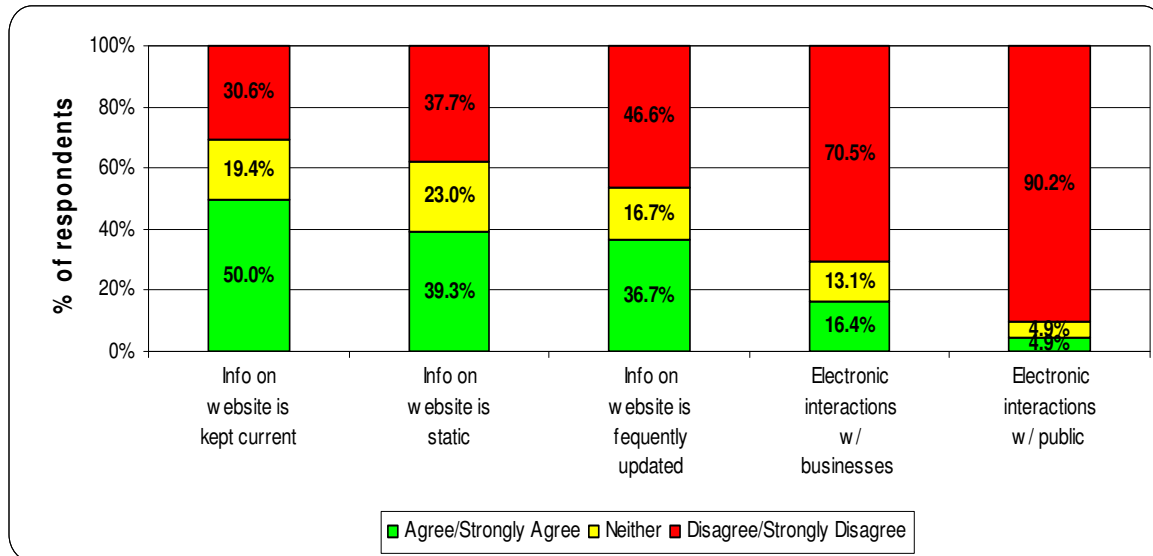
4.6.1 Maintenance of Websites and Involvement in E-transactions

Respondents were then asked to state their level of agreement to a series of statements related to the maintenance of the their websites as well as their involvement in electronic transactions.

Overall the update and maintenance of websites seems to be an issue for some of the organizations that were interviewed. In addition, very few organizations have integrated “clicks” with their external customers - either other businesses or the general public - into their “bricks-and-mortar” operations. Specifically:

- Nearly 40% of interviewees agreed that the **information on their website was static**.
- Just under half (47%) indicated that the **website information was not frequently updated**.
- Three in ten (30.7%) admitted that the **information on their website was neither current nor relevant**.
- Two in every ten organizations, primarily Private Sector companies, **conduct electronic business-to-business transactions** (over the Internet).

- Less than 10% of organizations, again mainly members of the Private Sector, **interact electronically (over the Internet) with the general public.**



4.6.2 Reasons For Not Having Website

Three in ten (30%) organizations indicated they do not currently have an operational website. However, in the case of one third of these organizations **construction is already underway**. Other organizations felt **this was not a company priority at this time** (27% of responses), **there was not enough management or employee interest** (23% of responses), or **that the venture would be too costly and the appropriate resources were not available** (12% of responses).

In a few of these cases, given the nature of the organization, it was indeed surprising to learn that there were no immediate plans afoot or urgency regarding developments in this area.

Why don't you currently have a website?			
Category label	Count	Responses	Cases
Under construction	8	30.8	32.0
On hold/Currently not a priority	7	26.9	28.0
No need/interest	6	23.1	24.0
Too costly/no resources	3	11.5	12.0
Use Parent/Umbrella website	2	7.7	8.0
Total responses	26	100.0	104.0

Below is a sample of the reasons given:

Natio

- *“The owner/manager does not see the need.”*
- *“Website is down because the Webmaster has passed away and not seen as a real priority.”*
- *“The previous director was not computer oriented and did not see a need.”*
- *“...given the type of business, management does not think that a website will add value.”*
- *“Company has not shown interest in this as yet.”*
- *“Does not think this is necessary at this time.”*
- *“Not the priority right now - Not enough IT in the Ministry to support a website.”*
- *“Re-engineering of financial and HR systems took priority over this.”*

4.7 Factors Impeding Growth Of E-Business

As the penultimate question in the survey, respondents were asked to share, in their opinion, their perceptions of the three factors which would most likely impede the growth of e-business in Barbados.

Representatives across the three organizational types were of the opinion that **the high telecommunications costs associated with the development and implementation of the IT infrastructure (25.9% of mentions)** would be the foremost obstacle. Next was **a lack of general understanding of the concept and benefits of e-business (17.2 % of mentions)**, followed by **the lack of skilled, trained resources in all areas relevant to the growth of e-business (13.2% of mentions)**.

Category label	Count	Responses %	Cases %
High telecommunication costs	45	25.9	52.9
Lack of education/understanding of e-bus	30	17.2	35.3
Lack of training/skilled resources	23	13.2	27.1
Poor IT infrastructural development	18	10.3	21.2
Lack of trust	16	9.2	18.8
Resistance to change	15	8.6	17.6
Not a priority for Gov't/Private Sector	15	8.6	17.6
Lack of legislative framework	8	4.6	9.4
C&W Monopoly	4	2.3	4.7
	-----	-----	-----
Total responses	174	100.0	204.7

4.8 Suggestions To Improve Barbados’ Overall State Of E-Readiness

The final question invited respondents to advise Government on improvements it could implement that would assist in furthering the growth and development of e-business in Barbados.

Several suggestions were posited, the foremost of which was **the implementation of a wide-reaching e-readiness public education/awareness campaign** (34.5% of responses). The consensus among interviewees was that there is a general lack of awareness as to the importance and benefits of an e-ready society as well as the roles that both Government and the Private Sector will play in this new business paradigm.

Smaller groups suggested **the provision of subsidies/incentives to the Private Sector to encourage their participation and involvement in the process** (9.2% of responses), **the putting in place of the appropriate IT and legislative infrastructure** (9.2% of responses), and **the deregulation of the telecommunications sector** (7.6% of responses).

<i>Advice to Government to improve overall state of e-readiness in Barbados</i>			
Category label	Count	Responses	Cases
Public Education	41	34.5	53.2
Business incentives/subsidies	11	9.2	14.3
IT/legal infrastructure	11	9.2	14.3
Deregulate Telecomm sector	9	7.6	11.7
Work to reduce telecomm rates	8	6.7	10.4
Training	7	5.9	9.1
National vision/strategy	7	5.9	9.1
Partner with Private Sector	7	5.9	9.1
Schools	6	5.0	7.8
International expertise	5	4.2	6.5
New Unit to drive process	5	4.2	6.5
Implement International standards	2	1.7	2.6
	-----	-----	-----
Total responses	119	100.0	154.5

Launch of Public Awareness/Education Campaign

- *“The Chamber of Commerce should have seminars or workshops to educate top managers, CEO etc. about Internet technologies to gain buy-in so that it can be pushed from this level.”*
- *“Do a services education campaign both inside and outside of Government.”*
- *“Educate the general public in this area and highlight the benefits of e-business to the general public e.g. paying bills on line saves time and in the long-run money.”*
- *“Government needs to educate the population about this and the benefits to be derived.”*
- *“Education of the people especially students (young one) who can then pass on to older folks at home.”*
- *“There is a need for more education for both businesses and the general public*
- *“Develop educational, promotional campaign to sensitize the public.”*
- *“Implement promotional campaign to educate the public about the importance of e-business in the global environment and also the benefits.”*

IT/legal infrastructure

- *“Create the appropriate legislative framework to facilitate it and help in the education process of it.”*
- *“Put the legislative framework and infrastructure in place and educate the public about this.”*
- *“Making sure that legislation is in place and enforced.”*
- *“Continue and speed up the legislation for financial transactions on the Internet and security of data.”*
- *“Speed up the legal framework.”*
- *“Implement legislation to ensure Internet security.”*
- *“Continue and speed up the legislation for financial transactions on the Internet and security of data.”*

Business incentives/subsidies

- *“Give concessions to businesses to make it viable and make them more competitive internationally.”*
- *“Provide incentives for private businesses to re-engineer their processes to an e-business stage.”*
- *“Provide financial incentives businesses for the use of e-commerce.”*
- *“Provide incentives to encourage participation.”*

Deregulation of Telecommunications Sector

- *“Get rid of the C & W monopoly faster.”*
- *“Open up the telecommunications avenue in Barbados.”*

- *“...Break the communication monopoly.”*
- *“Increase competition in telecommunication sector to bring down cost.”*

5.0 GENERAL PUBLIC

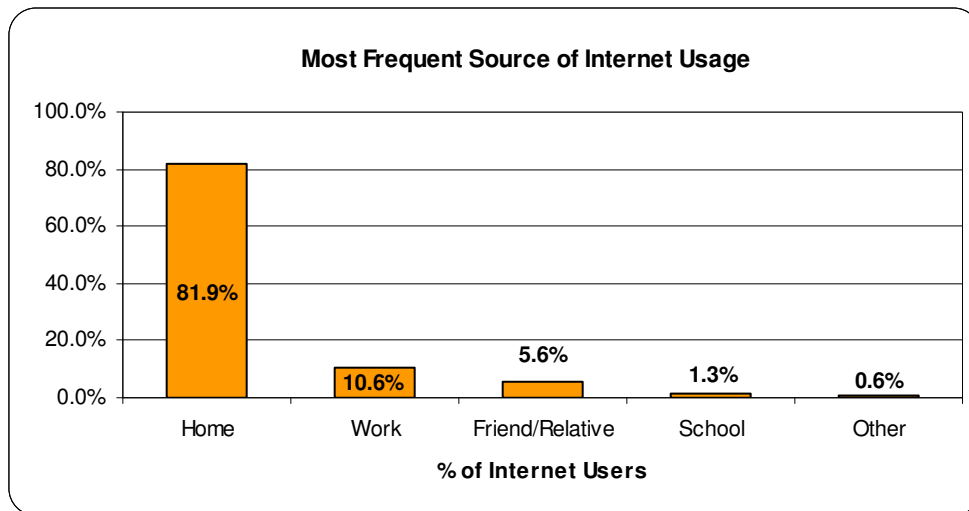
5.1 Internet Usage

Just over six in every ten (62%) household respondents indicated that they were users of the Internet. Demographically, these users were found moreso among:

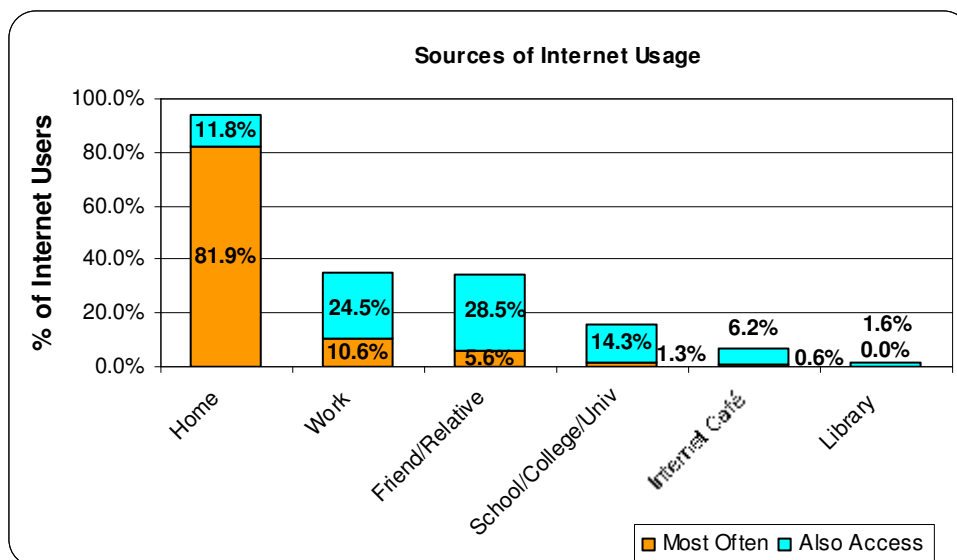
- Females
- Persons under 35 years of age
- Persons with Vocational or University education
- Persons in the following occupational categories:- Professionals, Business Executives, Clerical Staff, Technical/Technicians and Students

5.2 Sources of Use

The primary places of Internet usage were at home and in the workplace. The majority (82%) of Barbadian Internet users accessed the Internet from their homes, while the workplace was the source of primary access for one-tenth (11%) of the users.



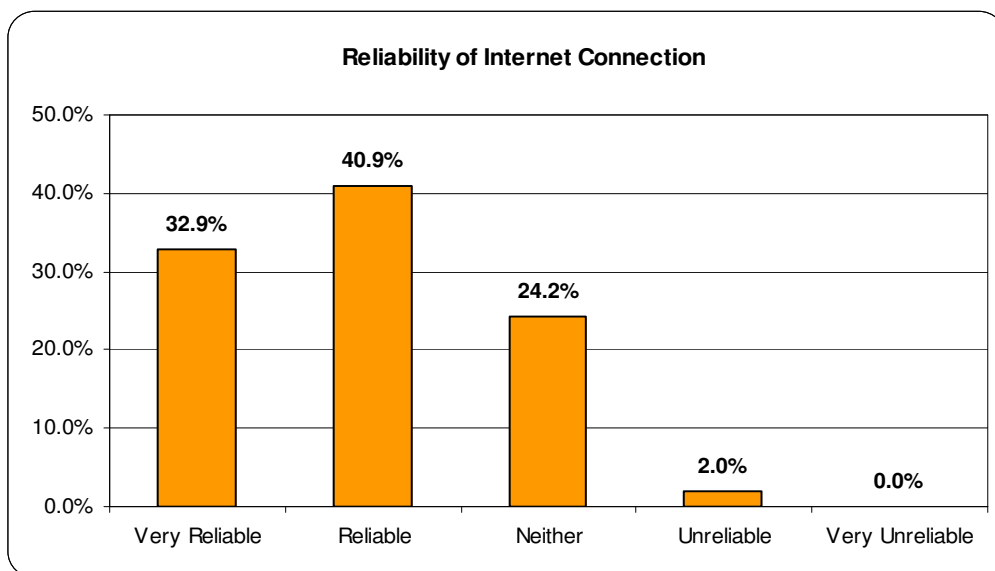
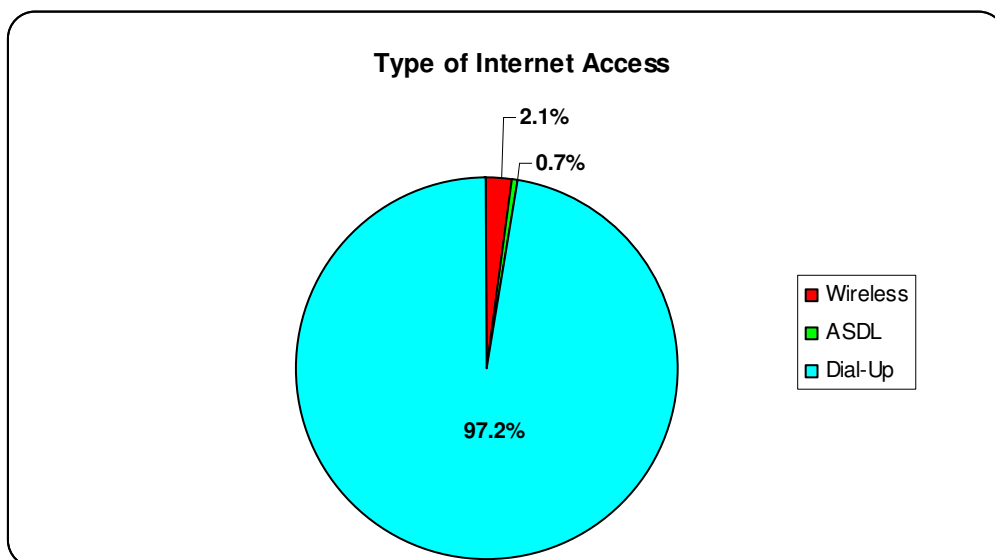
When asked about other sources from which they also use the Internet, work was again mentioned by an additional 29% of users while a quarter (25%) mentioned a friend/relative as their secondary source of Internet access.



5.3 Type and Reliability of Internet Connection

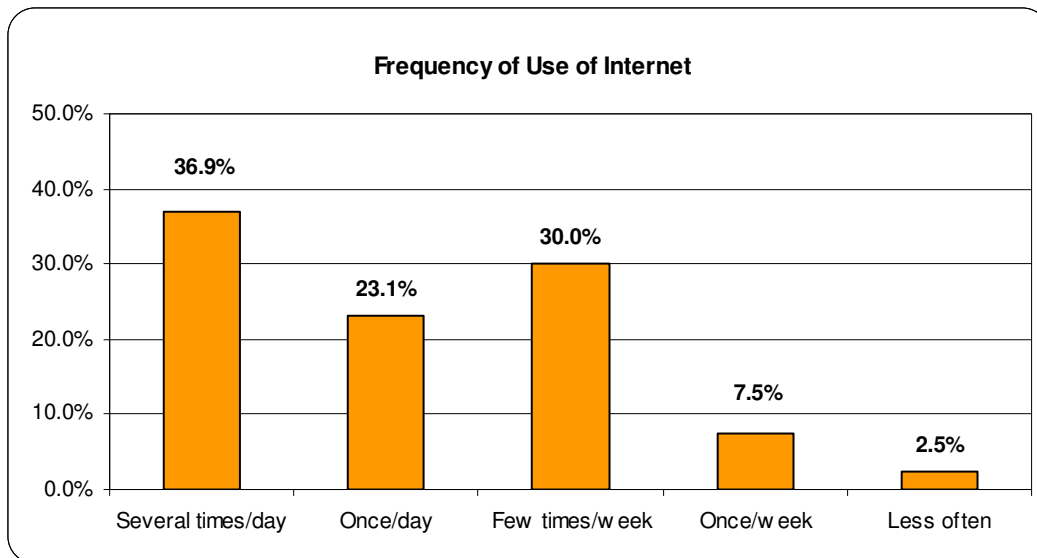
The vast majority (97%) of Barbadians on the Internet used a 56K Dial-Up connection as their means of access. Three quarters (74%) of these users described their connection as “Reliable” as they seldom or never experienced problems with connecting to the Internet.

Wireless (2%) and ASDL (1%) were used by extremely small proportions of residential Internet customers.



5.4 Frequency of Use of Internet

Internet usage is fast becoming a daily ritual for Barbadians. Sixty percent of users reported that they access the Internet at least once a day, while three in every ten respondents (30%) used the Internet a few times a week.

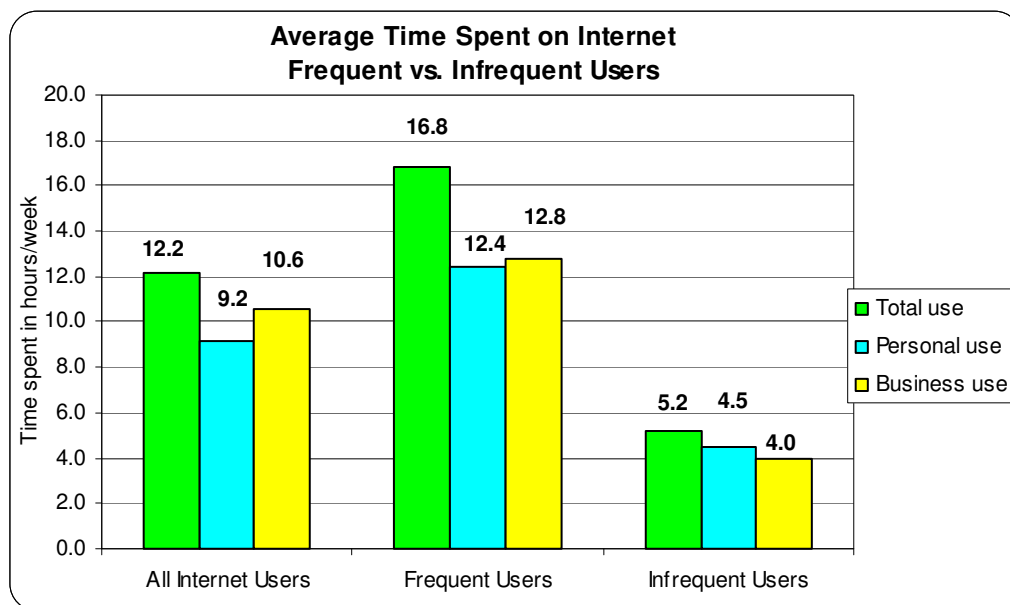


5.5 Time Spent on the Internet

Respondents reported spending an average of 12 hours a week (or about 1.75 hours/day) on the Internet, with time spent for personal use averaging 9 hours/week and an average of 11 hours/week being reported as business use.

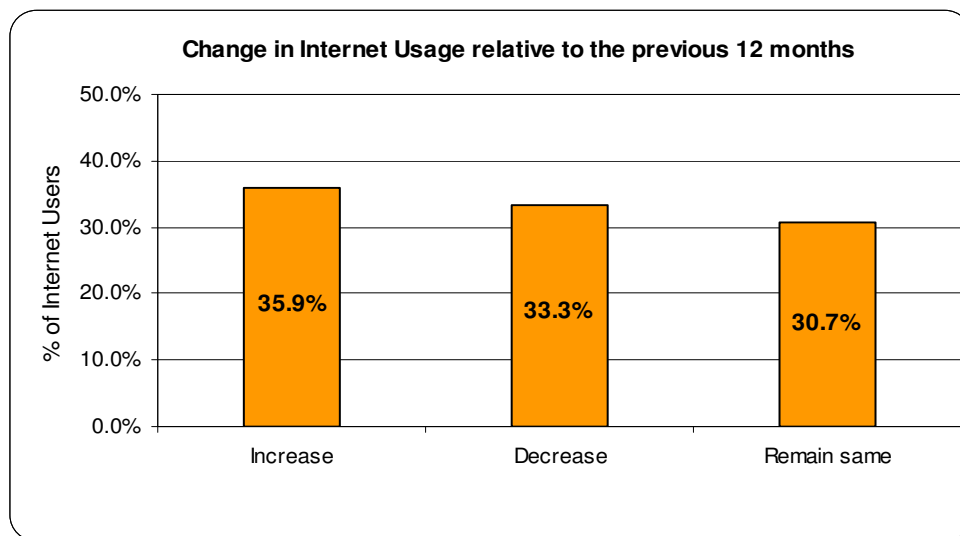
The average Internet usage times between frequent users (persons who use the Internet at least once a day) and infrequent users (persons who use the Internet at most a few times a week) vary significantly. Frequent users of the Internet, who represented 60% of all Internet users spent on average 17 hours/week (or 2.4 hours/day) on the Internet. This time was fairly evenly spread between involvement in both personal and business activities.

In the case of those who used the Internet less frequently, they reported spending on average 5 hours/week on the Internet.

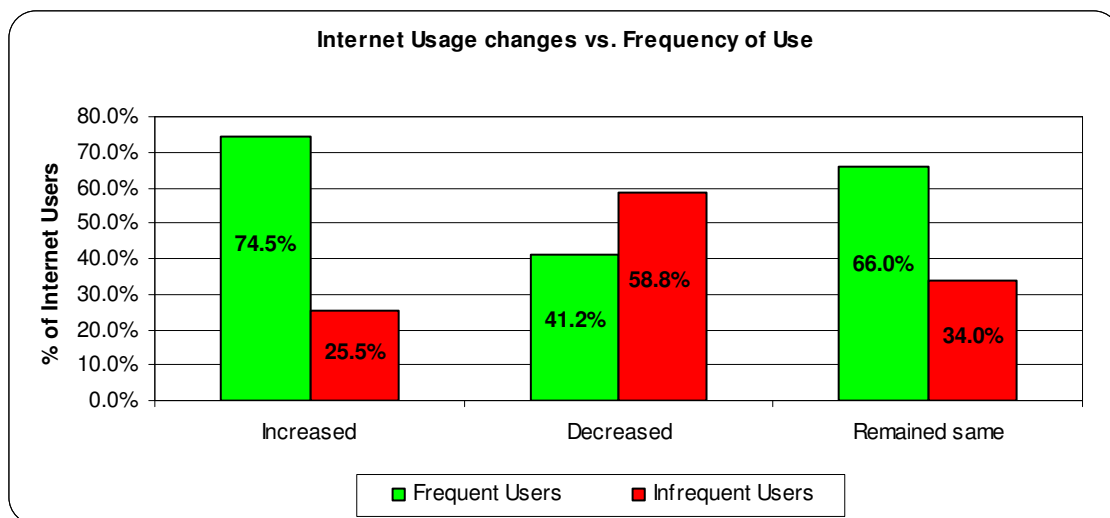


5.6 Change in Internet Usage

When asked about whether their usage behaviour has changed as compared with a year earlier, 36% indicated that they have increased their time spent on the Internet, one third (33%) reported a decrease while Internet usage for 31% has remained the same.



Frequent users were nearly three times more likely to report an increase in their Internet usage as compared with those who used the Internet less frequently (74.5% vs. 25.5%). On the other hand, infrequent users reported a decrease in their online time over the past year.

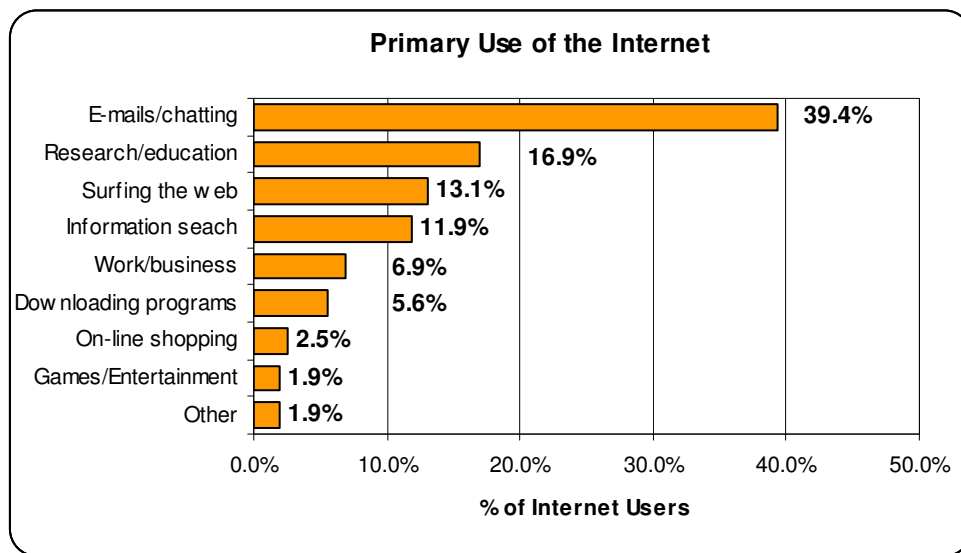


5.7 Primary Use of Internet

The primary online activity reported for Barbadian Internet users was **Email/online chatting**. Females, persons aged 18-34 and students reported significantly higher usage of the Internet for this activity.

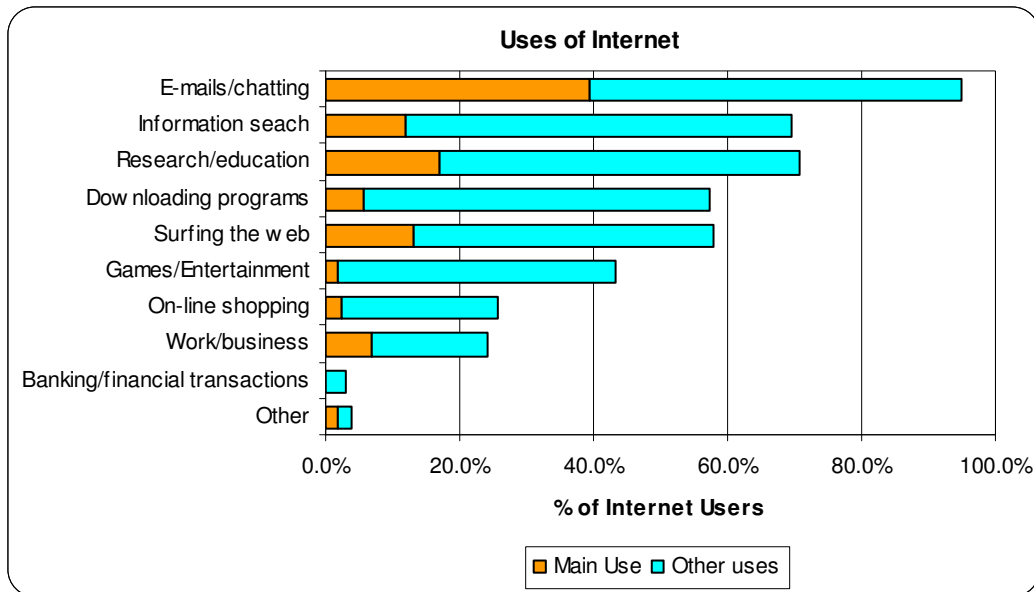
Conducting online research, with 17% of the users, was ranked as the second most popular use of the Internet.

Surfing the web (13%), **information searches** (12%), **conducting work/business** (7%) and **downloading programs** (6%) were also popular primary online activities for smaller groups of users.



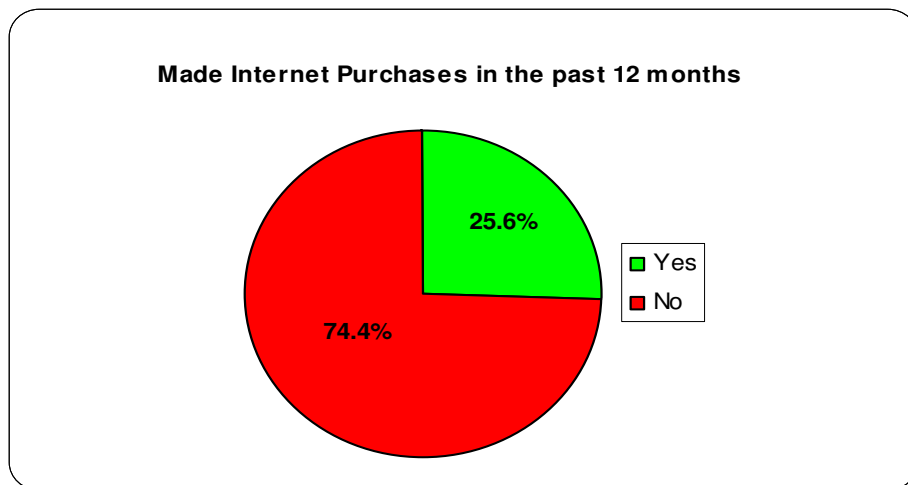
Other Internet Uses

When asked to list the other Internet activities in which they participate, **Email/online chatting** again features prominently. An additional 55% of respondents admitted engaging in this form of online communication as a secondary use of the Internet.



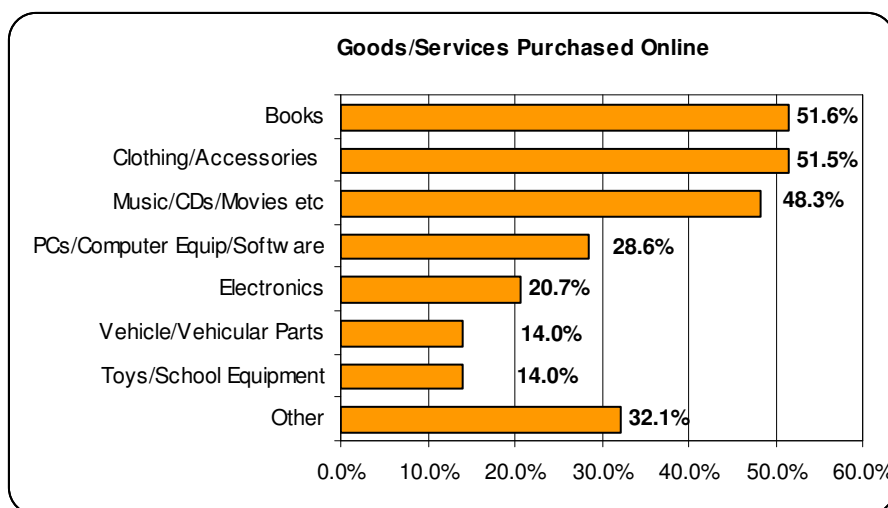
5.8 Online Purchases

Even though Barbadians are participating in several Internet-based activities, there is still an air of caution regarding their use of online shopping facilities. Only one quarter (26%) of Internet users have shopped online in the past 12 months. Respondents aged 25-44 and those with a University education were far more likely than their other counterparts to have engaged in this activity.



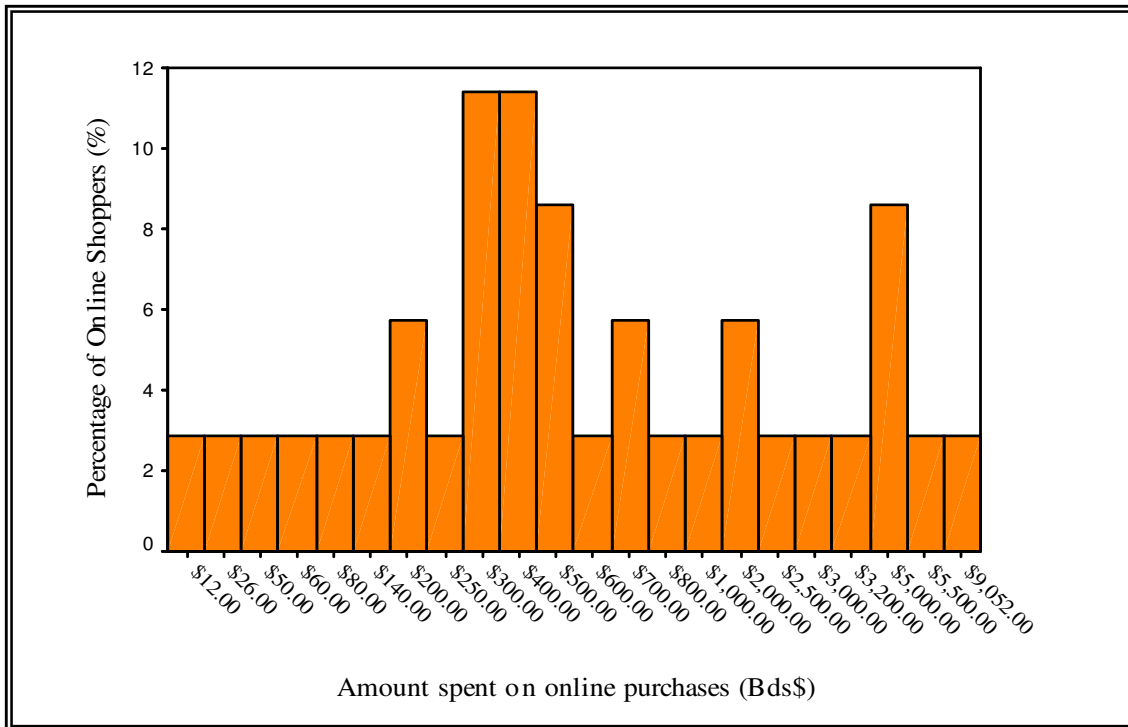
Goods and Services Purchased

Books (52%), **clothing/accessories** (52%) and **music/movies** (48%) were the items most frequently purchased by online Barbadian shoppers. Shoppers in the 25-34 age group were mainly buying books, CDs and music while females across all the age groups were the main purchasers of clothing and accessories.



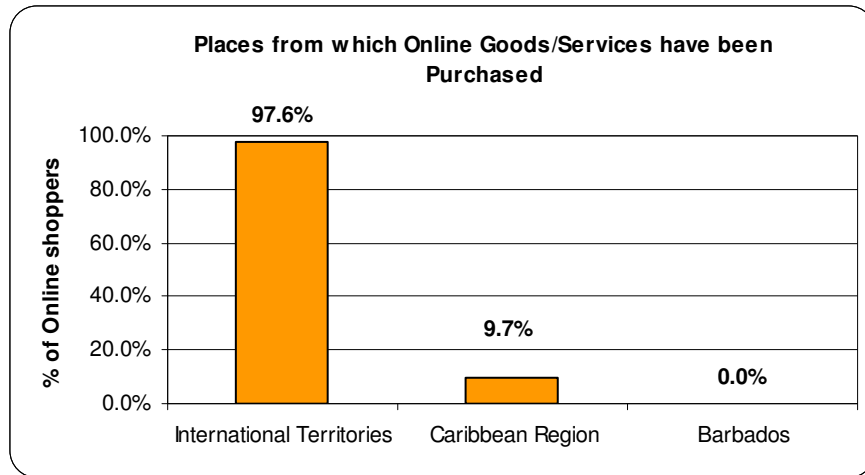
The mean spend on good and services in the past 12 months was **Bds \$1,468.00** with over half of the Internet shoppers spending at **least \$400** on their Internet purchases.

Persons who had spent in excess of **Bds \$1,000** were more likely to have purchased vehicles, or vehicular parts online.



Source of Internet Purchases

The vast majority (98%) of online shoppers had purchased their goods/services from International websites, while 10% used regional online suppliers. None of the online shoppers had ordered goods or services from companies located in Barbados.

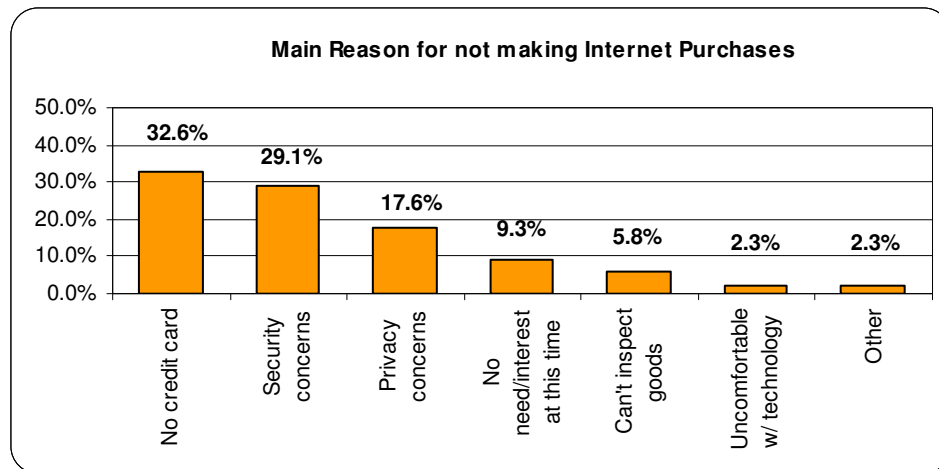


5.9 Reason for not Making Online Purchases

Those respondents who use the Internet but who have not made any online purchases in the past year were asked their reasons for not shopping online. One third (33%) of these respondents were unable to shop online because **they do not own a credit card**.

Concerns with the security of online shopping was the reason given by 29% of this sub-sample, while 18% have shied away from participating in online commerce due to **privacy concerns**.

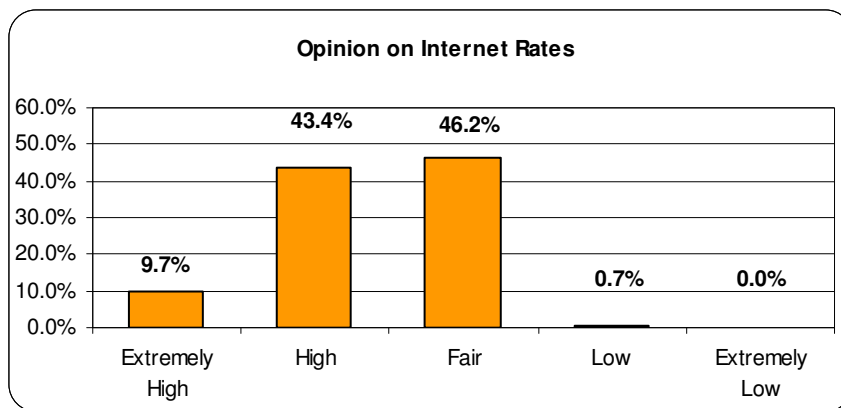
Smaller groups of respondents stated as their reasons: **a lack of interest in online shopping** (9%), **an inability to inspect the goods purchased** (6%) and **a discomfort with technology** (2%).



5.10 Opinion of Internet Rates

Internet users were divided on the question of whether the Internet rates currently being charged were too excessive. Just over one half (53%) of the Internet users agreed that the rates were either high or extremely high while 46% feel that the rated being charged were fair.

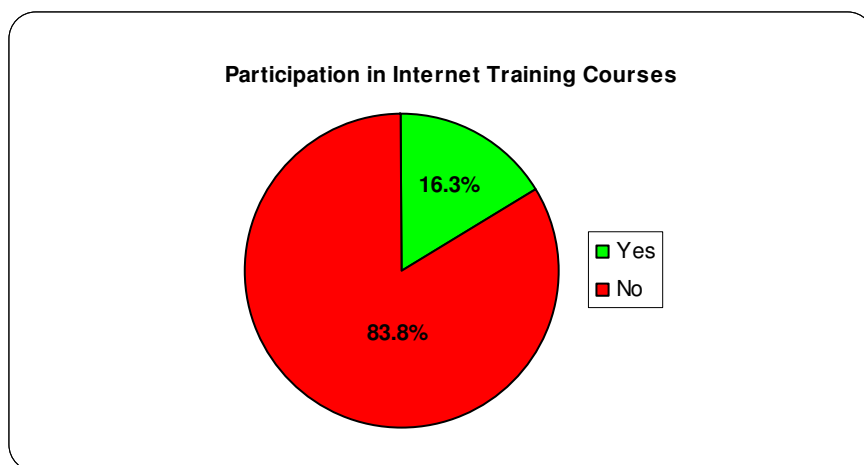
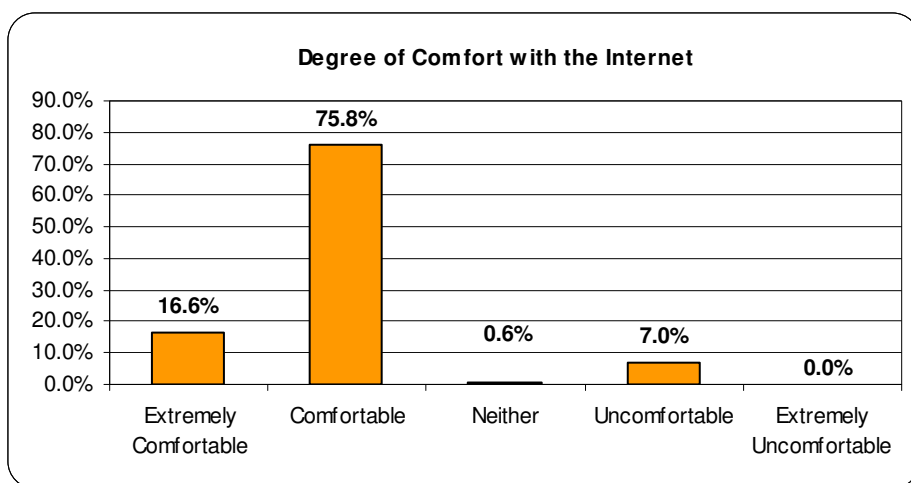
The segments expressing these two dissenting opinions did not differ significantly across any of the major demographic classifications.



5.11 Participation in Internet Courses/Level of Comfort with Internet

The vast majority of Barbadians are generally at ease maneuvering in the domain of the World Wide Web. Over 90% of the Internet users felt that they were at least comfortable with the Internet. As expected, frequent users were nearly twice as likely to be extremely comfortable with the Internet than those who accessed it less frequently.

Only 19% of users have ever participated in any formal Internet training courses.



5.12 Influence of Internet on Users' Lifestyle

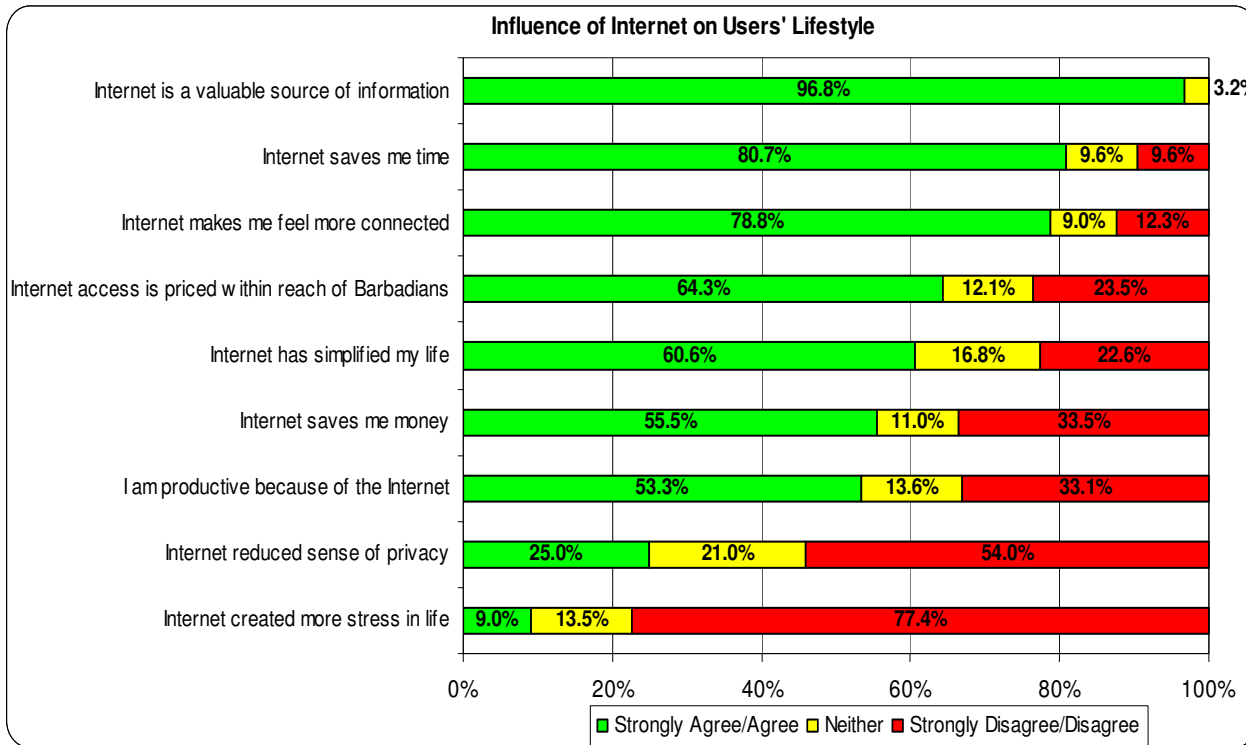
Users of the Internet were asked to state their level of (dis)agreement to a series of statements which focused on the influence of the Internet on their lives.

Overall, the results indicate that Barbadians believe that Internet usage has had no significant negative impact on their lifestyles. Respondents generally agreed that the medium is a valuable source of information, which saves them time, and makes them feel more connected.

They disagreed with the view that the Internet has reduced their sense of privacy or that it has created more stress in their lives.

The specific results were as follows:

- The vast majority (**96.8%**) agreed that the Internet is a valuable source of information.
- Eight in every ten respondents (**80.7%**), especially males and users in the 25-44 years age group, agreed that the Internet saves them time.
- Approximately **80%** felt that the Internet makes them feel more connected.
- About two-thirds (**64.3%**) indicated that the Internet is priced within the reach of Barbadians.
- Sixty percent (**60.6%**) of users felt that the Internet has simplified their lives.
- Fifty five percent (**55.5%**) believed that the Internet saves them money. Agreement with this view came particularly from males and users in the 25-34 years age group.
- Just over half (**53.3%**) felt that they are more productive because of the Internet. Males (**65%**) were more likely to agree with this statement than females (**45%**).
- One quarter (**25%**) of respondents were in agreement with the statement that the Internet has reduced their sense of privacy.
- Only **9%** agreed that that the Internet has created more stress in their lives.



5.13 Participation in Online Activities

With an increase in Internet usage worldwide, activities, which traditionally existed only in the offline world, are quickly migrating to the domain of the World Wide Web.

As Barbados's e-commerce sector develops, the feasibility of introducing these types of activities will be further explored. Therefore, to obtain an early indicator of acceptance for these types of activities respondents were presented with a list and were then asked:

- (i) if they have ever participated in any of the activities
- (ii) the likelihood to use the activities if they were made available online

Actual Participation

Overall, respondents had engaged in few of the activities that were presented to them. However, there was a high level of interest expressed by respondents for most of the activities if they were made available in Barbados.

One quarter (25%) of the users have **purchased goods/services online**, 22% have **registered for a job online** and 12% have **registered for an online course**. The other activities have been tried by very few respondents.

Likely Participation

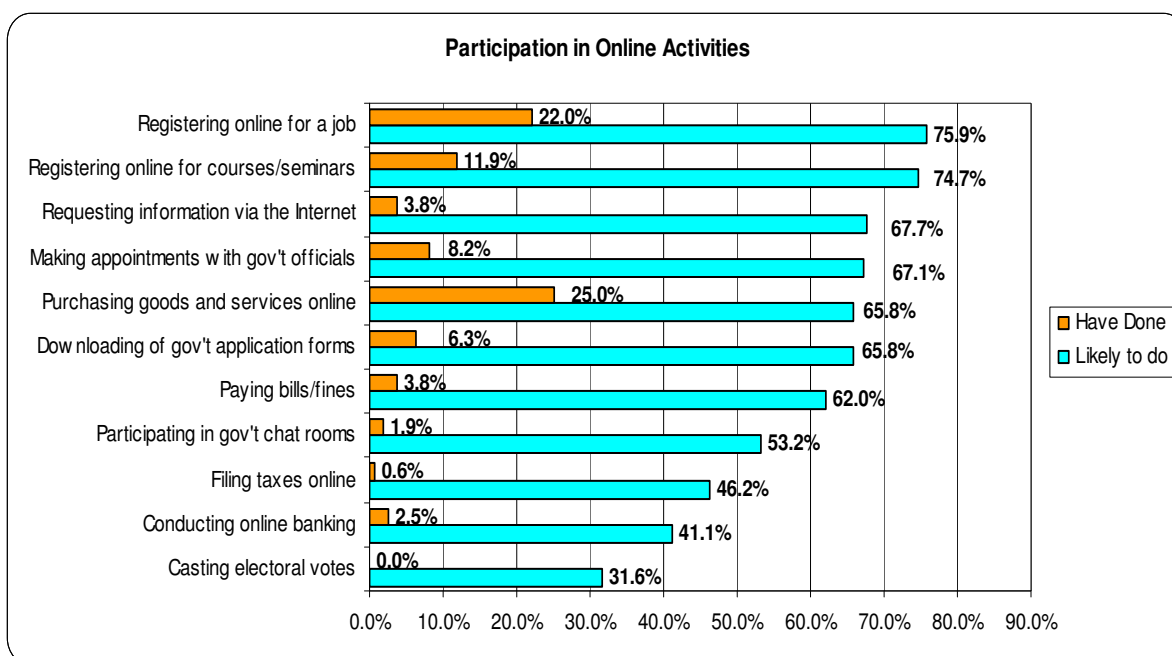
Of prime interest, especially to Internet users under the age of 45, was the opportunity to **register online for jobs** (76%).

Seventy five percent expressed an interest **in registering online for courses/seminars**. Females and users aged 25-54 years were more likely

Interest in **using the Internet to request information** (68%) was generally higher among persons aged 25-44 and those with a University education.

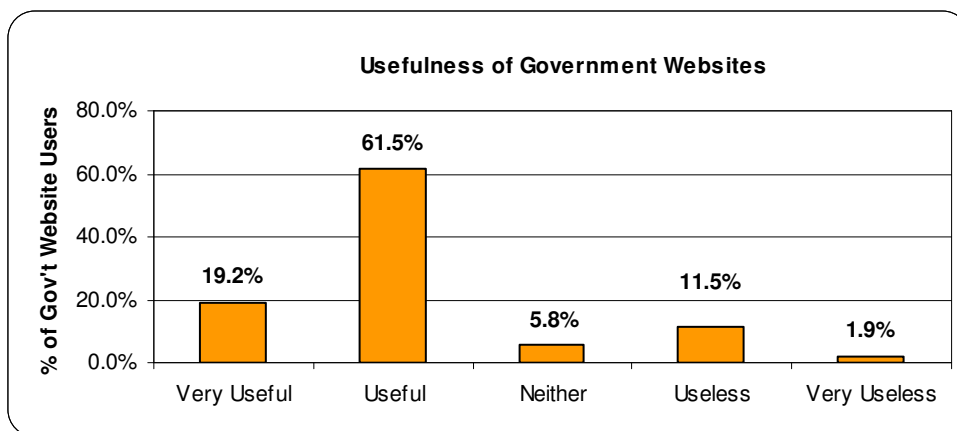
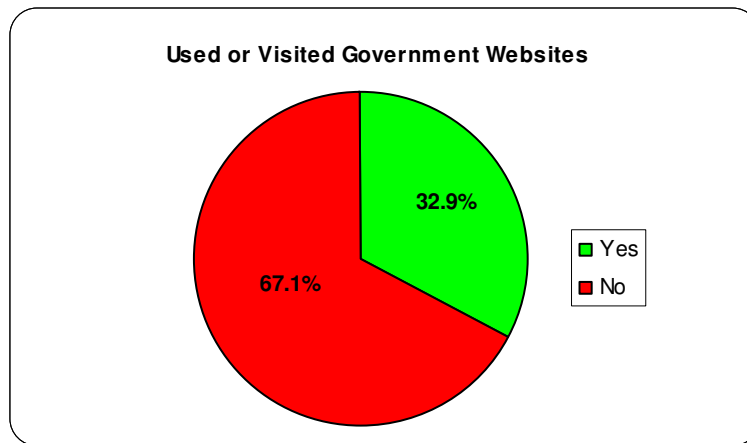
Just over two-thirds of the users (67%) indicated that they would be likely to use the Internet **to make appointments with Government officials**. This interest was greater among the 25-34 age group and the University educated.

Interestingly, almost one third (32%) showed an interest in **the online casting of electoral votes**. This is especially true for respondents in the 25-34 age group.



5.14 Visits to Government Websites

One third (33%) of the online users had used or visited the government websites, with just over 80% of this sub-sample considering these sites to be useful. Adults in the 25-54 years age range were far more likely to access these websites.



5.15 Government Websites Visited

Respondents were then asked to give the names of the Government websites they have used or visited.

The **Barbados Labour Market** website (www.labour.gov.bb) received the highest number of mentions. This site is especially popular among females, Internet users aged 18-44, and the unemployed.

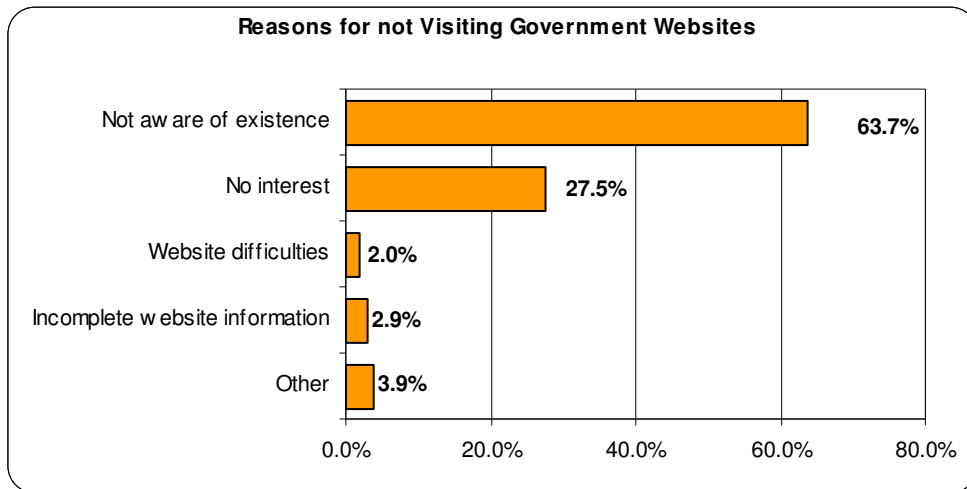
The **Government Information Service** (www.bgis.gov.bb), with 11 mentions, and the **Barbados Tourism Authority’s** website (www.barbados.org) with 10 mentions, are the next frequently accessed Government websites by the Barbadian Internet users.

The other results are shown in the table below.

Website Visited	Number of Mentions
Barbados Labour Market Information System – www.labour.gov.bb	23
GIS - www.bgis.gov.bb	11
Barbados Tourism Encyclopedia - www.barbados.org	10
Ministry of Education/EDUTECH	4
NIS	2
Other – Government <ul style="list-style-type: none"> ○ CBC ○ Corporate Affairs ○ Customs Department ○ International Business ○ Public Sector Reform 	All receiving single mentions
Other – Non Governmental <ul style="list-style-type: none"> ○ Barbados Community College ○ UWI 	

Reasons for not visiting Government Websites

Almost two-thirds (64%) of the respondents, particularly females, cited a “**lack of awareness of the existence of Government’s websites**” as their main reason for not frequenting these websites. **Not having an interest in these websites** was the reason given by 28% of these respondents.



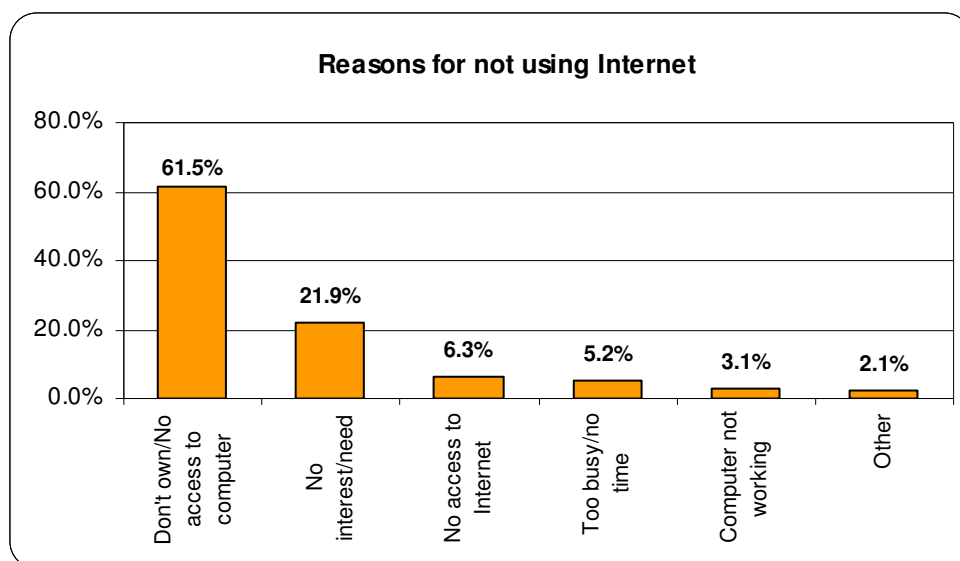
5.16 Reasons for not Using the Internet

About four in every ten persons (38%) interviewed reported that they were not users of the Internet users. These individuals were predominately:

- Older adults (in the 45+ age group)
- Labourers/craftspersons, housewives, retired persons
- Respondents with at most a primary or secondary education

The most popular reason given was that 62% of these non-user respondents either **do not own or have no access to a computer**.

An additional one fifth (22%) indicated that they either **have no need or no interest in accessing the Internet**.



6.0 CONCLUSION AND RECOMMENDATIONS

Undoubtedly, Barbados' e-commerce sector is still in a nascent stage of development. However, in our favour, there are areas of our economic, social and political structure that will facilitate a much smoother transition to this new e-society, than many of the other developing nations.

As evidenced in this study, we have a stable political system, a highly educated and trained workforce, a reasonably strong economy, as well as a leadership that has taken the initiative in incorporating elements of e-readiness into our society. However, to be able to successfully compete in and fully reap the benefits of this new digital age, there are several critical areas which need to be addressed.

The dynamic nature of this issue necessitates a continued effort by Government in the development of its e-vision and e-strategy. Based on the feedback and insights gathered from this study, below are some recommendations that can assist in this effort.

- The National Council for Science and Technology (NCST) under the aegis of the Ministry of Commerce must be commended for its efforts at managing the e-commerce portfolio. However, greater visibility needs to be given both to this office and to their mandate. If e-business and e-government are priority areas for the Government of Barbados, then this vision, the strategy to achieve it, and the body charged with its execution must all be more prominently marketed to the citizens of Barbados.
- In addition, to ensure that there is understanding and “buy-in” at all levels of society, the concept and benefits of an *E-ready society* must be well communicated. Therefore, to heighten the awareness and interest of the public, there is a need for a general mass **E-ready Education and Marketing Campaign**, possibly with its unique E-ready slogan and jingle/slogan. The use of forums like BGIS in this venture should also be considered.
- Although e-commerce related legislation in the form of **The Electronic Transactions Act** has been enacted and discussed in some forums, the survey results point to a high level of lack of awareness of this legislation and the areas it covers. Hence there is a need to continue to promote and educate both businesses and the general public, through all

available media, on the application of the legislation as well as any subsequent amendments.

- To facilitate in this transition, the continued involvement of and collaborations with the Private Sector in areas of training opportunities, seminars, joint sponsorships etc. should also be actively pursued.
- Ensuring that the future generations are exposed to and can interact with the advancing technology is also vitally important in this new digital age. Hence programmes like **EDUCTECH** and competitions like **Childnet** which assist in the reformation of both teaching and learning practices, are encouraged. However, employers must also be educated as to the benefits of IT training and in being able to attract and retain skilled IT professionals. Implementing programmes aimed at reducing the threatening IT perception and increasing the IT comfort level of the workforce is also recommended.
- Though there is some hesitancy on the part of the general public, the overall results in both surveys indicate a readiness to move from the passive stage of reading information on Government websites to more (inter)actively participating in government activities online. Therefore serious consideration should be given to prioritization of the government processes and services, which could be automated.
- Finally, comments from the business community identify a prevailing concern about the financial impact wide-reaching IT infrastructural changes of this kind would have on the affordability of telecommunications rates. To ensure that there is even access and availability to the Information and Communications Technologies, then Government must continue to negotiate with the Telecommunication Providers for affordable, cost-effective rates.

APPENDICES

Appendix 1: Infrastructural Indicators

CONNECTIVITY INDICATORS

- Personal computer per 1,000 inhabitants 68ⁱ
- Number of Internet users Approx 30,000
- Number of Web Servers 2ⁱⁱ
- Number of Secure Web Servers 2ⁱⁱ
- Number of Domain Names 506ⁱⁱ
- Max and Min Bandwidth for Internet transmission 2(DS3) and 45 Megabits per secondⁱⁱ

TELECOMMUNICATION INDICATORS

- Telephone lines per 100 inhabitants 42.71ⁱⁱⁱ
- Telephone service monthly subscription charge (business) Bds \$94.01 (VAT Inclusive)
- Telephone service monthly subscription charge (residential) Bds \$35.65 (VAT Inclusive)
- Cellular connection charge Bds \$100 - \$150

CONNECTIVITY INDICATORS

- Average market price of a personal computer Bds\$2,395
- Average Salary of an IT Programmer Bds\$2,000 – Bds\$10,000
- Number of jobs in IT sector 1421 (at Sept 2000)
- Number of jobs in IT sector 1141 (at Sept 2001)
- Number of jobs in IT sector 1071 (at Sept 2002)
- Cost of registration of a domain name Bds\$115/yr VAT Inclusiveⁱⁱ
- Average cost of design of a simple webpage Bds\$1200 - \$1500

SOCIAL INDICATORS

- Population 270,752
- Literacy Rate 97%^{iv}
- Number of children enrolled in secondary education 17,765ⁱ
- Public spending an education as a percentage of GDP 8.32%

ⁱ Census 2000
ⁱⁱ Data received from only one ISP
ⁱⁱⁱ Report: *Benchmarking E-government – A Global Perspective: Assessing the Progress of the UN Member States*
^{iv} UNDP Report 1999

SOCIAL INDICATORS (cont'd)

- Number of public libraries offering Internet services 1 (out of 8 branches)
 - Speightstown – 12 terminals with 10 providing public Internet access
 - Bridgetown has computers for private use (librarians – research)

MACROECONOMIC INDICATORS

- GDP 5097.9^v
- Per capita income 15.7 ('000)^v
- Economic growth 2.8%^v

^v Provisional 2001 data

Appendix 2: List of Organizations Interviewed for the Project

GOVERNMENT MINISTRIES

- Ministry of Agriculture and Rural Development
- Ministry of the Civil Service
- Ministry of Finance
- Ministry of Commerce – Consumer Affairs & Business Development
- Ministry of Economic Development, Industry and International Business
- Ministry of Education
- Ministry of Foreign Affairs (Foreign Affairs & Foreign Trade)
- Ministry of Home Affairs
- Ministry of Labour & Social Security
- Ministry of Physical Development & Environment (Environment Unit)
- Ministry of Public Works & Transport
- Ministry of Tourism & International Transport (Tourism)
- Ministry of Tourism & International Transport (International Transport)
- Prime Minister’s Office

STATUTORY CORPORATIONS

- Barbados Agriculture Development & Marketing Corporation
- Barbados Community College
- Barbados Light & Power
- Barbados Tourism Authority
- Barbados Water Authority
- BIDC
- Caribbean Broadcasting Corporation
- Fair Trading Commission
- National Conservation Commission
- National Council of Substance Abuse
- National Cultural Foundation
- National Housing Corporation
- National Petroleum
- National productivity Council
- National Sports Council
- Rural Development Commission
- Sanitation Services Authority
- Technical and Vocational Education & Training Council
- Urban Development Commission
- Vocational Training Board

PRIVATE SECTOR COMPANIES

- A & B Music Supplies Ltd
- AS Brydens & Sons
- Al Hart Public Relations Inc.
- Antillean Products
- Armstrong Agencies
- Banks (Barbados) Breweries Ltd
- Barbados Bottling Company
- Barbados Dairy Industries Ltd
- Barbados Fire& General
- Bayer Caribbean
- Barbados Packaging Industries
- Berger Paints Ltd
- Booth Steamship Co. Ltd.
- BRC West Indies Ltd
- Barbados Cruise Services
- Cariaccess
- Caribbean Commercial Bank
- Caribbean Financial Services
- Caribbean Graphic Productions
- Carter's General Store
- Cave Shepherd & Harrison's
- Chickmont Foods
- Coles Printery
- Corbin Communications
- Da Costas Mannings
- Electric Sales & Services
- Eric Hassell & Son Ltd
- Esso Standard Oil
- Everson Elcock & Co. Ltd.
- Fujitsu ICL
- Gatsby Incorporation
- Greg Hoyos Associates Inc./Insight
- H. Jason Jones
- Hinds Transport
- Lazy Days and Island Wares
- Marshall Trading
- Mc Earneay and Stokes & Bynoe
- McCann Ericson
- Motor Services Ltd.
- Mount Gay Distilleries
- Nari (Barbados) Ltd.

- Nation Publishing Co.
- Purity Bakeries
- R.M. Jones
- Roberts Manufacturing
- Sagicor
- Sam Lord's Castle
- Sea Freight Agencies
- Shell Antilles
- Simpson Motors
- Soje Lonsdale
- Standards Distributors (B'dos) Ltd
- Star Products Co. Ltd
- T Geddes Grant (Illuminat)
- TMR Sales & Services Ltd.
- United Insurance
- West Riley
- Yankee Garments