

Perspectives on the Use of the Internet in Sri Lanka

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Executive Summary

The survey examines the use of computers and the Internet in Sri Lanka from the perspective of the Internet Service Provider (ISP) members. It attempts to describe the general nature of IT use in terms of the availability, access, familiarity and general conditions associated with using computers and the Internet in the country. The survey was conducted in July 1999. Questionnaires were e-mailed to 9448 ISP members in Sri Lanka, using e-mail addresses available to us at that time. Altogether, 560 members completed and returned questionnaires via e-mail to MIT's Laboratory for Computer Science. Descriptive analysis of both quantitative and qualitative data was then conducted.

Major quantitative findings include:

- Over 60% of the respondents were members of their respective ISPs for two or less years, and over half had first used a computer sometime during the 1990-99 period.
- Sixty-two percent of the respondents had sent 10 or more e-mails per week over the past six (or less) months, and 52% had received 15 or more e-mails per week during the same period.
- Nearly half of the respondents used a computer at home, and 48% indicated 33.6K as the baud rate to connect their ISPs.
- Seventy-eight percent of the respondents spent 1-9 hours per week sending and receiving e-mails, and a large majority (68%) spent 1-9 hours surfing the Web.
- A majority of the respondents were positive about conditions in the workplace, such as the number and quality of opportunities for training and skill development, the quality of telecommunications facilities, and the quality and reliability of Internet connections.
- An overwhelming majority of the respondents indicated that ISP subscriber fees, computer hardware and software costs, and telecommunications charges were generally high.
- Most respondents were generally positive about 1) the quality of access to the Internet, 2) the quality of access to e-mails, Web pages and other Internet-based features, and 3) various benefits of Internet access.
- Seventy-one percent of the respondents were male; nearly half were younger than 35, and a large majority were educated (with at least a high school diploma.) Private company employees and people in business comprised over half of the respondents.

Major qualitative findings include:

- It is crucially important to have faster access to information, increased communication at low costs, online-education and training, and increased efficiency in business, professional and organizational activities.
- Matters of considerable concern include the low bandwidth, the high telecommunications charges, the low quality of Internet services, and the lack of organized information and databases.
- Greatly needed is a raising of awareness, a change in the current regulatory environment, an open government, and a set of local information resources to support commerce.

Chapter I: Introduction

New advances in the Internet and its associated technologies are opening great opportunities for development in many low-income countries. As a result, developing countries are rapidly acquiring information technologies to increase Internet access in many sectors, despite a number of barriers that stand in the way. It is true that most areas of the developing world find themselves under great pressure and incapable of moving with the times due to, among others, poor infrastructure, unfriendly policy and regulatory environment and severe economic problems. And yet, their interest in new information and communication technologies has not receded, but multiplied significantly over the years. While technologies are proliferating rapidly in some places, particularly in urban areas and affluent neighborhoods, efforts are lacking in developing the proper framework to assess the use and impact of the Internet and other technologies in developing country settings. This study is only a small, exploratory step and we admit that considerable distances need to be covered in this process.

A survey instrument was developed in early 1999 at MIT's Laboratory for Computer Science (LCS) as part of our exploratory work in understanding the current use of information technology in developing countries. Comments on the draft of the instrument were gathered from members belonging to an informal group at LCS, and the revised instrument was e-mailed to members of various Internet Service Provider (ISP) members in Sri Lanka in July 1999. The questionnaire was sent to e-mail addresses of 9,448 ISP members available to us at the time¹.

The study population consisted of the 560 ISP members in Sri Lanka who responded to the questionnaire by the deadline. As announced in the questionnaire, three individuals from among the respondents were randomly selected as winners in a raffle on July 30, 1999, and each of the winners was awarded a prize. Since many e-mail addresses may have been inactive or disconnected, additional attempts to collect responses from those who had not responded was not made, nor reasons for non-response explored in order to resend the questionnaire for the second time, particularly to the non-respondents. The study is, thus,

¹ The questionnaire was sent as part of the body of the e-mail and not as an attachment, anticipating the problem some might face with retrieving e-mail attachments in the mostly low-bandwidth environment of Sri Lanka.

limited in scope and in its implications for other settings. Despite this, the survey provides some useful information on the general state of information technology use in the setting of a developing country.

Respondents were asked a variety of questions concerning their perspectives on the use of computers and the Internet in Sri Lanka (see Appendix.) Rating scales ranging from four to five points were used to measure perspectives on a number of topics and issues. Semantic differential scales were used to measure responses to a particular question by a series of response scales, each of which is a seven-point continuum bounded at its extremes by a bipolar adjective pair, repeated in this case for each response scale. A few open-ended questions were used to collect qualitative data for their variety, richness and breadth of perspectives.

1.1. Sri Lanka: Background

Sri Lanka, a developing island nation situated in the Indian Ocean southeast of India, is the 24th-largest island in the world. Its mixed population, rich culture and variety of religions make it resemble Asia in miniature. The country, famed for its fine tea, gemstones, and colorful landscapes, has a population of 20 million. Its economy is based primarily on agriculture, and its three basic agricultural commodities are tea, rubber and coconuts. The country has a system of land transportation that links even the most remote villages. Its capital, Colombo, has one of the largest artificial harbors in the world, which handles about 80% of the country's sea trade. Colombo is also a major refueling and supply port for merchant ships.

Despite long-running ethnic tensions and political setbacks, the country is moving forward resolutely with plans and programs linking various sectors of development. Education has remained a focus of national attention for a considerable period. School attendance in the country is compulsory for children between the ages of 5 and 14, and the adult literacy rate of 85% is among the highest in the developing world. Sri Lanka, formerly called Ceylon, became independent from British rule in 1948.

Sri Lanka provides an ideal setting for this study in that it is a newly emerging country where the pace of development is medium—neither too slow nor too fast—and the Internet and its associated technologies are opening new opportunities as well as challenges for development. The country is, as a result of the introduction of new technologies, facing problems and constraints on many frontiers usually not experienced, or yet to be experienced, by many others that are less developed and technologically behind. This study is, thus, an attempt to increase our understanding of the situation in such a setting.

The other, and equally important, reason for considering Sri Lanka for this study is that the country has already started a progressive deregulatory process in the telecommunications sector. An independent regulator, Telecommunications Regulatory Commission of Sri Lanka (TRCSL), modeled after FCC in the

United States, governs the telecom policy. Sri Lanka Telecom (SLT) and four private sector companies presently handle the basic telephone service for voice using cable loops and wireless local loops. Four other private sector companies are actively competing in providing cellular mobile telephone services. In addition, SLT and four other operators are licensed to provide international data services, which include Internet traffic. Another ten companies are competing to provide Internet access to consumers. As a consequence, a very robust and dynamic market for Internet services exists in Sri Lanka. A feat several other developing countries have yet to achieve.

There are presently about 310,000 direct exchange telephone lines including cellular mobile telephones (which amount to about 60,000), according to Telecommunications Regulatory Commission of Sri Lanka (TRCSL). And it is expected that direct telephones will reach 636,000 lines by December 2000.

1.2. Focus of the Study

The study primarily focused on the use of computers and the Internet in Sri Lanka. The purpose was to examine ISP members' perspectives on different aspects related to the use of computers and the Internet in Sri Lanka. ISP members were asked to indicate their personal attributes, particularly their gender, age, education, profession and area of major interest (specialization). Objects of examination, thus, include:

- a) ISP Member Attributes
- b) Distribution Across ISPs
- c) Length of Membership
- d) Exposure to Computers
- e) Extent of E-mail Use
- f) Location of Computer Use
- g) Use of Internet Services
- h) Speed of Connection
- i) Extent of use of Various Electronic Services and Programs
- j) Conditions in Workplace
- k) Costs
- l) Quality of Access to the Internet
- m) Electronic Communication Tools
- n) Purpose of Use of E-mails, Web Pages and Other Internet-based Features
- o) Benefits from Access to the Internet

1.3. Qualitative Assessment

Respondents were asked four open-ended questions for qualitative assessment of the use of computers and the Internet in Sri Lanka. Questions concerned:

- a) Initiation of new activities as a result of ISP membership
- b) Perspective on the Internet-based ISP services useful for business, professional activities or education
- c) Perspective on ways to use computing and communications for various local activities in the country
- d) General perspectives

Chapter II: Findings of the Survey

2.1. ISP Member Attributes

Five questions related to ISP members' personal attributes (or background). Questions concerning demographic attributes dealt with members' gender, age, level of education, area of major interest (or specialization), and profession or professional status/position.

2.1.1. Gender

Findings indicate that an overwhelming majority (71%) of ISP members were male and only 17% were female (see Figure 1). About 12% of the respondents did not respond to the question.

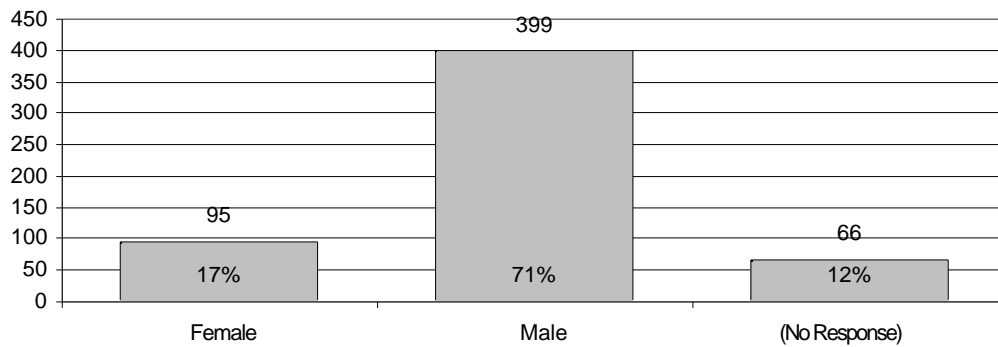


Figure 1. ISP Members' Gender

2.1.2. Age

As far as age is concerned, nearly half (48%) of the respondents are 35 and younger. As Figure 2 shows, only 8% are 56 or older.

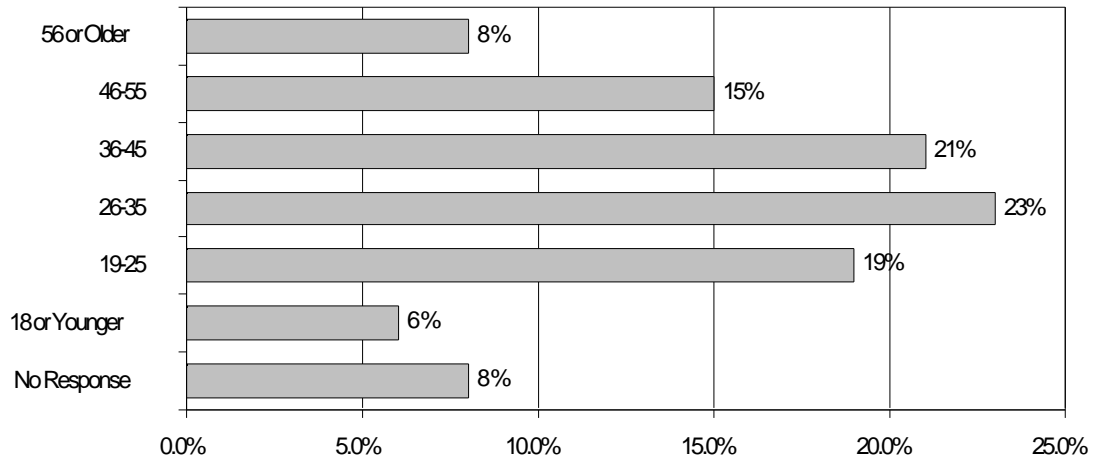


Figure 2. ISP Members' Age

2.1.3. Education

The data show that most of the members are relatively educated. Over a third of them have completed at least a Bachelor's degree, as Figure 3 displays.

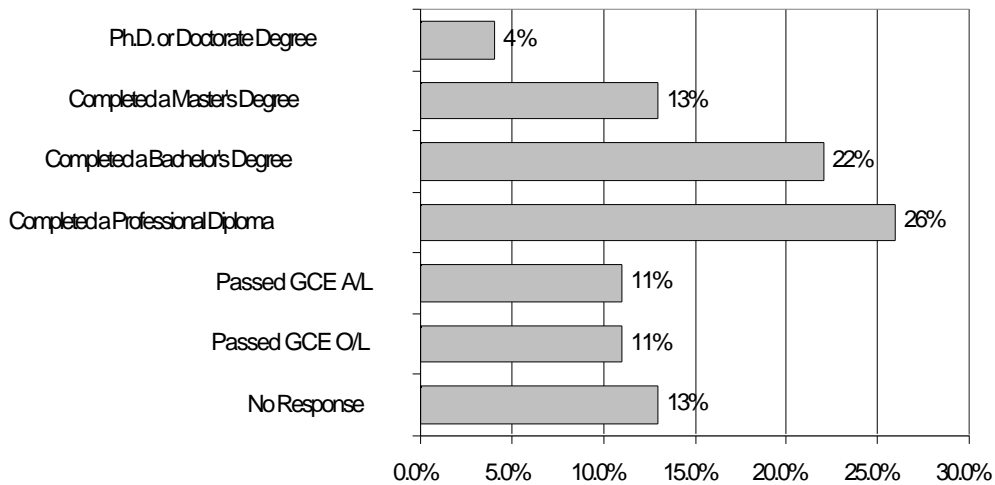


Figure 3. ISP Members' Level of Education

2.1.4. Area of Major Interest

One question related to respondents' area of major interest (or specialization). Respondents were asked to identify the discipline with which they would most closely identify. They indicated a range of disciplines as areas of major interest, as Figure 4 displays. People in business form the largest group (22%), while physical sciences and fine arts represent the smallest groups, each with only 1%.

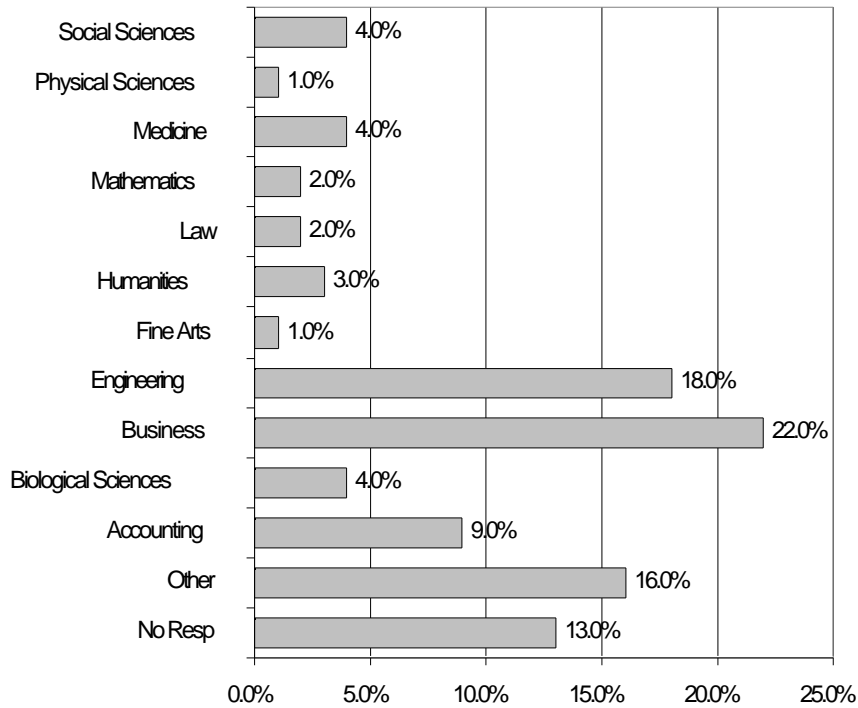


Figure 4. ISP Members' Area of Major Interest

2.1.5. Profession

As far as respondents' profession or professional status is concerned, nearly a third (31%) of the respondents are private company employees. In addition, as Figure 5 shows, 19% of respondents are involved in business. This shows a high level of interest in the Internet and new technologies on the part of the private sector.

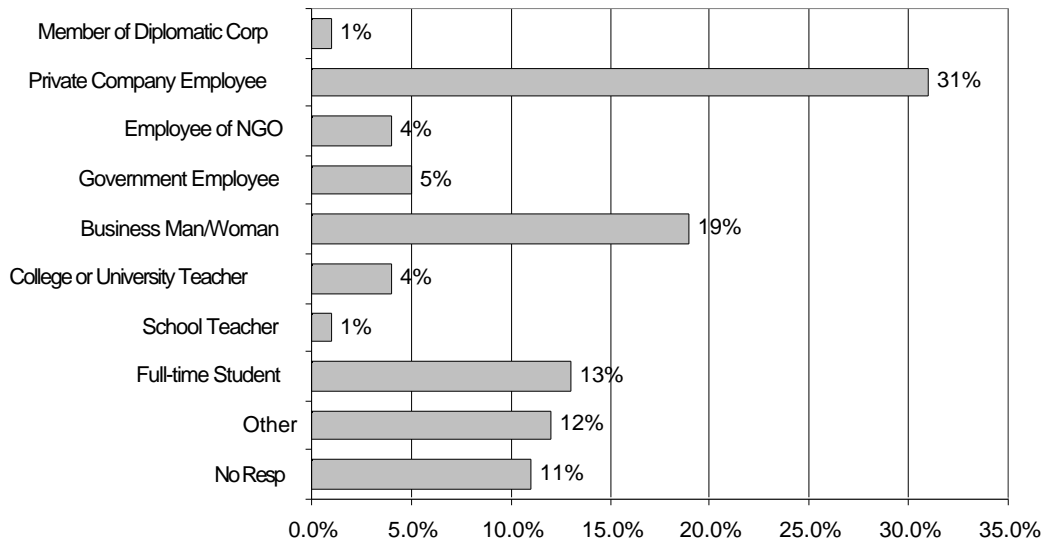


Figure 5. ISP Members' Profession

2.2. Distribution across ISPs

Based on the responses received at the time, there were seven ISPs in Sri Lanka. They are:

- a) Sri Lanka Telecom
- b) Lanka Internet Services
- c) Eureka On-Line
- d) ITMIN
- e) Pan Lanka
- f) Lanka Com Services and
- g) Dynanet

Two service providers—Sri Lanka Telecom (35%) and Lanka Internet Services (31%)—commanded over two-third of all members, and the rest of the members are distributed among five other service providers. Lanka Com Services and Dynanet each belong, as Figure 6 presents, to the lowest provider category, each with only 1% of the total members.

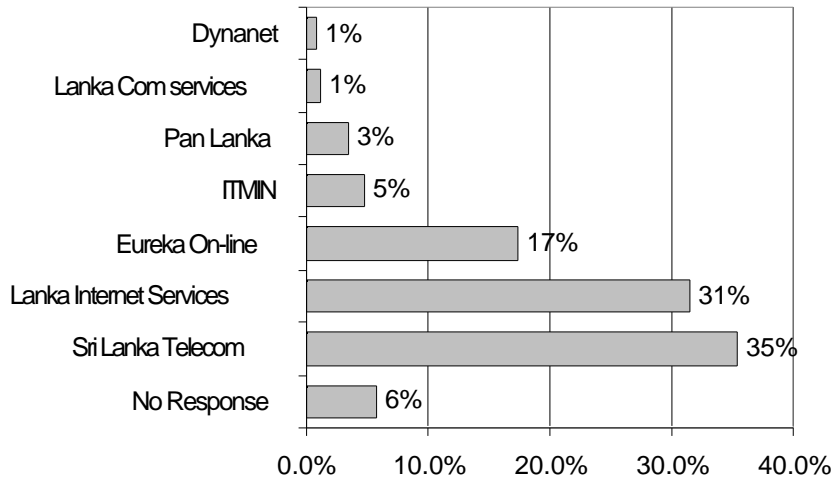


Figure 6. Distribution across ISPs

2.3. Length of Membership

The survey examined the length of ISP membership in terms of the number of months or years a member remained with his/her ISP on a five-point scale. Two groups, which indicated that they were members of their respective ISPs for two or less years, formed a large majority (60%) of respondents. As Figure 7 displays, a considerable number of members (33%) indicated that their membership extended over two years.

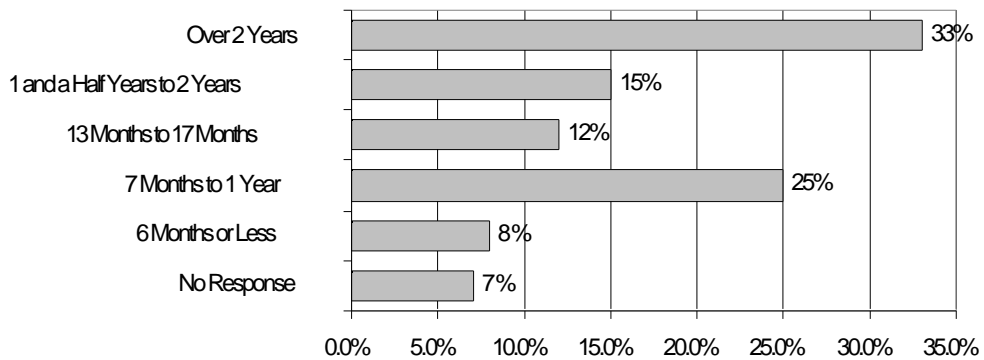


Figure 7. Length of Membership

2.4. Exposure to Computers

One question was concerned with the date of first exposure to computers. Respondents were asked to indicate the year when they first used a computer. Their responses were organized into five different categories:

- a) Before 1980;
- b) 1980-1984;
- c) 1985-1989;
- d) 1989-1994; and
- e) 1995-1999.

It was found that over half of the respondents had first used a computer sometime during the 1990-1999 period. Very few individuals (3%) had first used a computer before 1980, as Figure 8 displays.

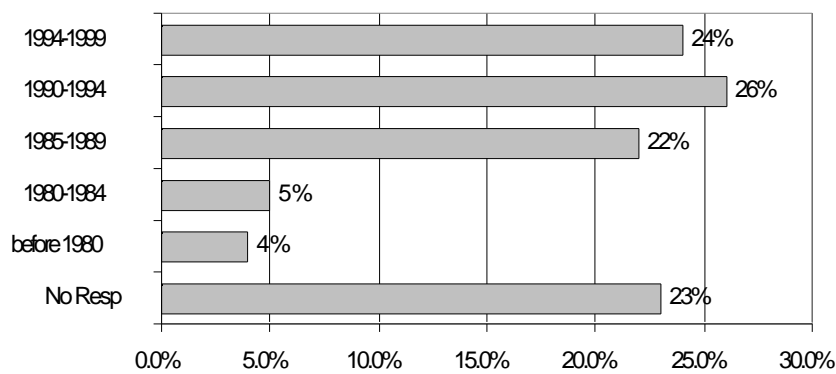


Figure 8. ISP Members' Exposure to Computer

2.5. Extent of E-mail Use

To examine the extent of e-mail use, respondents were asked a) how many e-mails they had sent and b) how many they had received per week on an average over the past six (or less) months. As Figure 9 presents, a large majority (62%) of respondents had sent 10 or more e-mails and nearly a third had sent 9 or less e-mails. On the receiving side, a majority (52%) of respondents had received 15 or more e-mails per week. Only 11% indicated that they had received less than 4 e-mails per week, as Figure 9 displays.

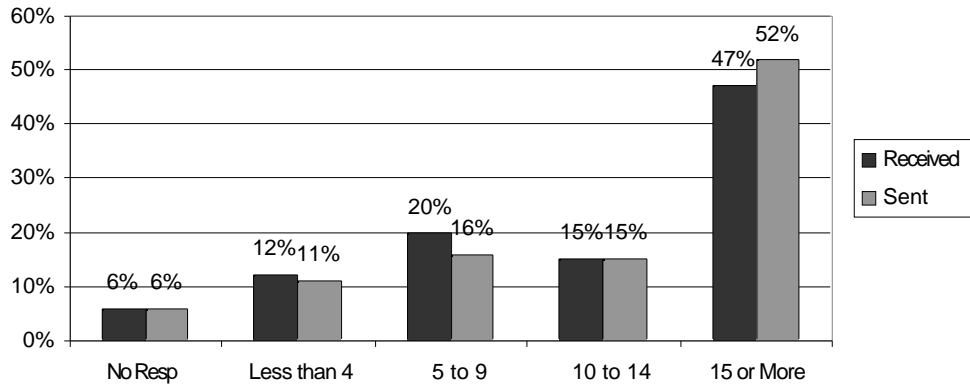


Figure 9. Extent of E-mail Use

2.6. Location of Computer Use

ISP members were asked to indicate the location where they currently use a computer. Their responses were organized into the following seven categories:

- a) Office only
- b) Home only
- c) Other only
- d) Office and Home
- e) Office and Other
- f) Home and Other
- g) Office, Home and Other

It was found that nearly a half (48%) of the respondents use a computer at home, as Figure 11 shows. The second largest group (22%) consists of members who use a computer at home only, while 10% of members use a computer at home, office and in other places. Other places include various institutions (other than where they work) including universities, Internet Cafés, cyber shops, telecenters, and while traveling.

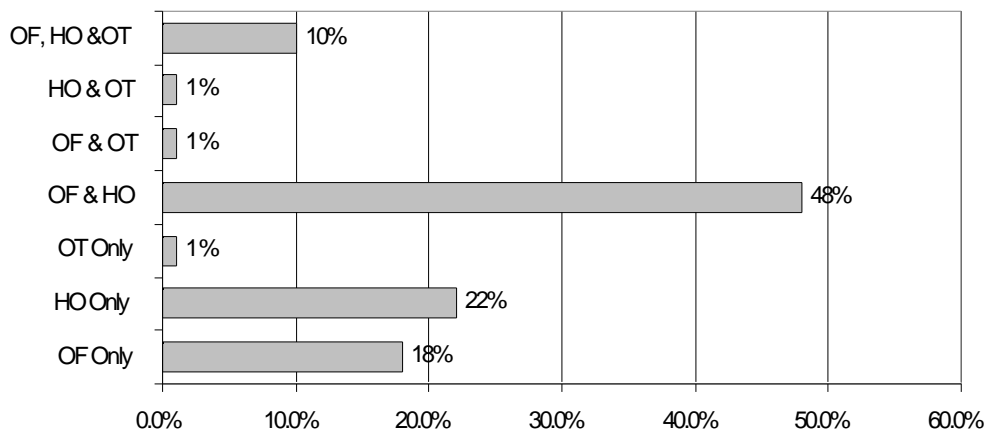


Figure 10. Location of Computer Use

[Note: OF=Office, HO=Home and OT=Other]

2.7. Use of Internet Services

One question was concerned with the use of Internet services other than e-mail. The list contained the following services:

- a) World Wide Web
- b) Telnet
- c) Usenet News Groups
- d) Chat
- e) FTP or Other File Transfers
- f) Publishing Information on the Web
- g) Other Services

Members' responses were organized into three general categories for the convenience of analysis of results:

- a) World Wide Web
- b) Three or Less Services
- c) Four or More Services

Analysis of responses shows that an overwhelming majority of respondents used the World Wide Web. Nearly half (49%) of them used three or less Internet services and only a few (1%) used four or more Internet services, as Figure 11 displays.

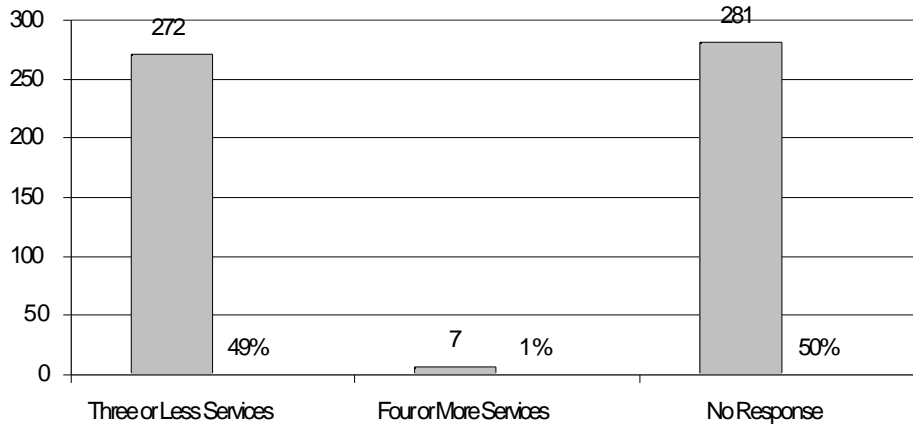


Figure 11. Use of Internet Services

2.8. Speed of Connection

Respondents were asked to indicate the current baud rate or speed at which they were connecting to their ISPs. As Figure 12 displays, nearly half (48%) of the respondents indicated 33.6K as the baud rate. A few (2%) indicated 1200 or lower speed and about 1% indicated 512K or higher speed.

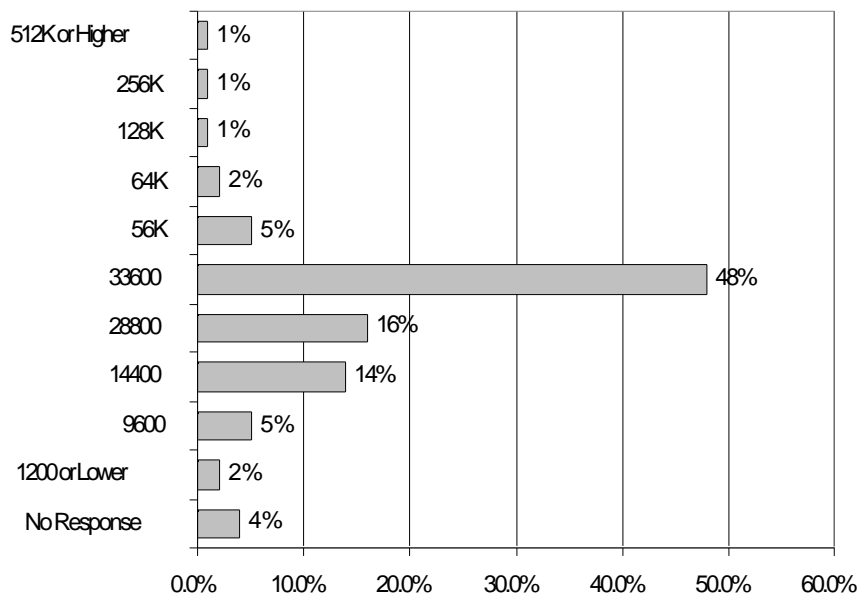


Figure 12. Speed of Connection

2.9. Extent of Use of Various Electronic Services and Programs

One question related to the extent that respondents used various electronic services (and/or programs) in terms of hours per week. Services included:

- a) Reading and writing e-mail
- b) Surfing the World Wide Web
- c) Reading news on Usenet News Groups
- d) Publishing Information on the Web
- e) Use of Office tools
- f) Other

Responses were organized into five categories:

- a) 1-9 hours
- b) 10-19 hours
- c) 20-29 hours
- d) 30-39 hours
- e) 40 or more hours.

2.9.1. Reading and Writing E-mail

As far as reading and writing e-mail is concerned, 78% of respondents spent 1-9 hours per week on sending and receiving e-mails, as Figure 13 displays. Only 1% spent 30-39 hours on such an exercise.

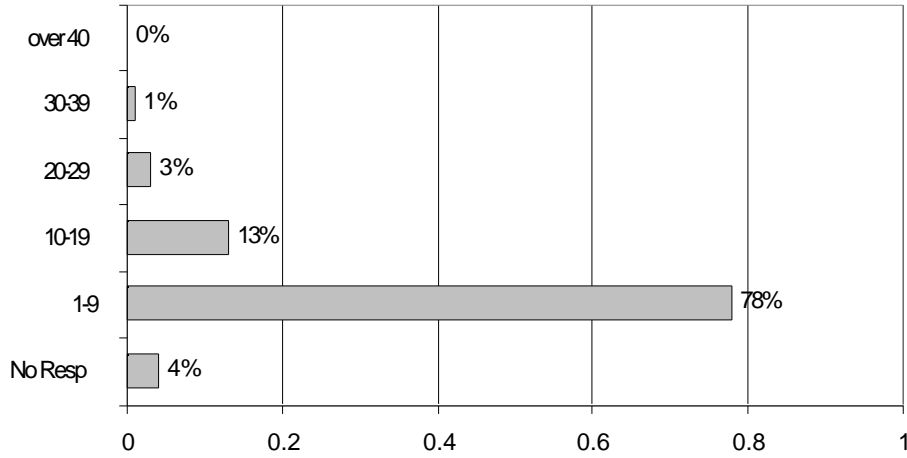


Figure 13. Reading and Writing E-mails

2.9.2. Surfing the World Wide Web

As Figure 14 presents, a large majority (68%) of respondents spent 1-9 hours surfing the Web, and only 4% spent 20-29 hours on such an activity.

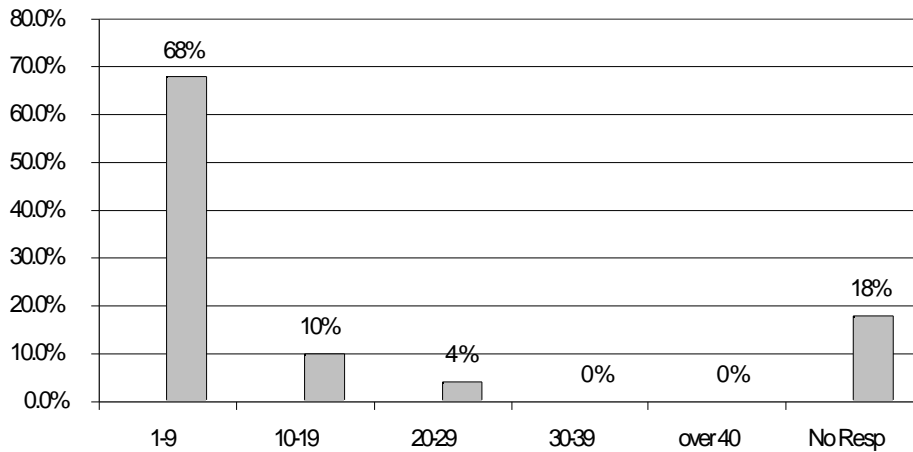


Figure 14. Surfing the World Wide Web

2.9.3. Reading News on Usenet News Groups

Reading news on Usenet News Groups was less common amongst respondents, as results indicated that only 25% spent 1-9 hours using this service. Three-fourths of the respondents did not answer, as Figure 15 shows.

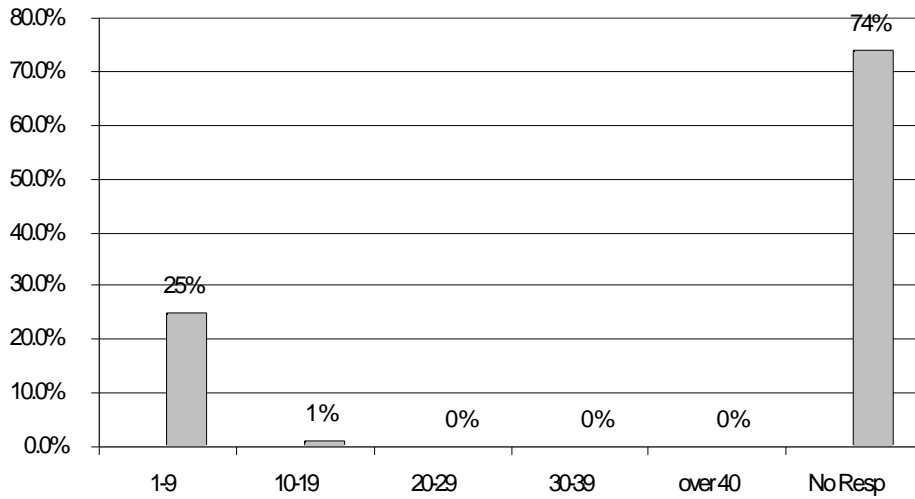


Figure 15. Reading News on Usenet

2.9.4. Publishing Information on the Web

Fourteen percent of respondents spent 1-9 hours per week publishing information on the Web, as Figure 16 displays.

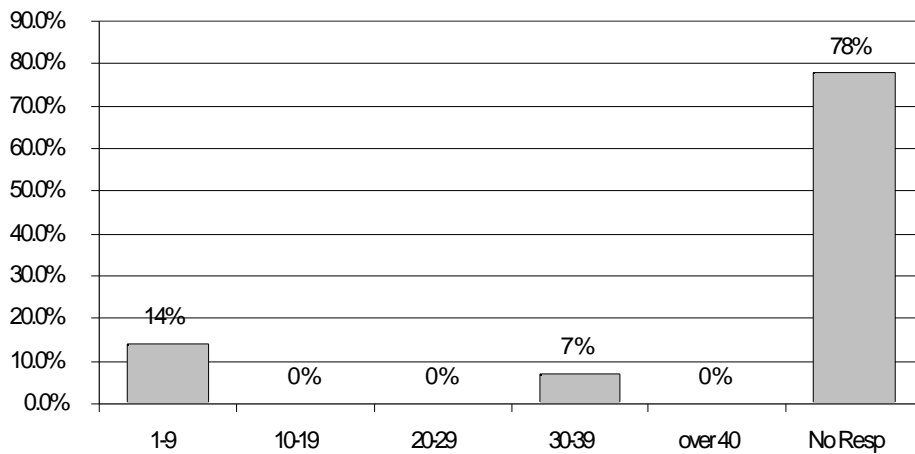


Figure 16. Publishing Info on the Web

2.9.5. Use of Office Tools

Nearly 37% of the respondents indicated using office tools for 1-9 hours per week, and about the same fraction (34%) used the tools for 10-29 hours (combining the 10-19 and 20-29 categories), as Figure 17 displays.

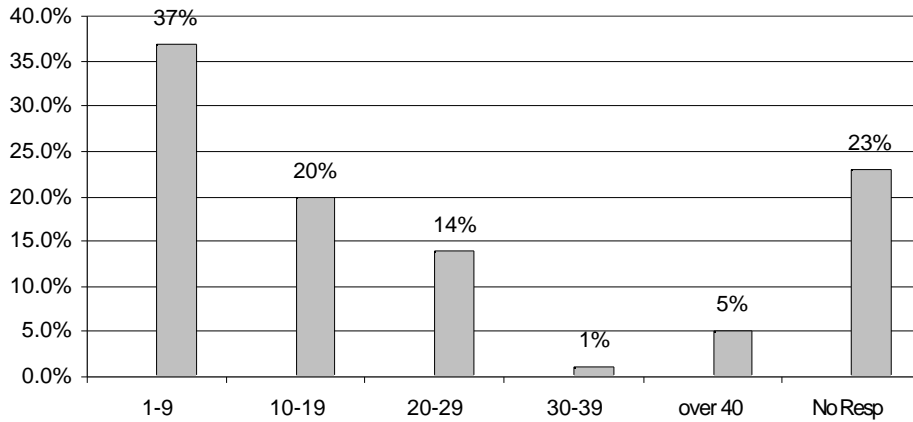


Figure 17. Use of Office Tools

2.9.6. Use of Other Tools

Use of other programs or services does not figure prominently, although nearly a quarter of the respondents indicated using other tools for varying hours, as Figure 18 shows.

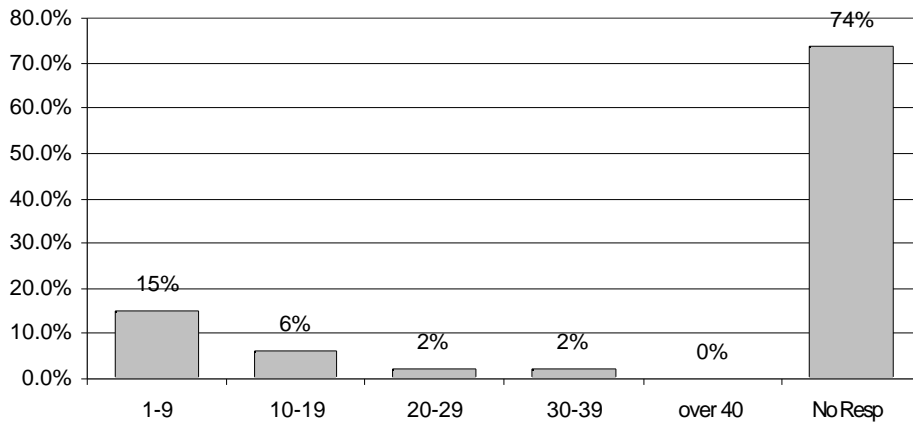


Figure 18. Use of Other Tools

2.10. Conditions in Workplace

One question was concerned with the conditions in the workplace or locality. The respondents were asked to assess the quality of the following items in terms of their experience as ISP members in Sri Lanka. The items include:

- a) Opportunity to receive computer training or develop computer skill
- b) Quality of computer training or skill development
- c) Quality of telecommunications facility
- d) Quality and reliability of the Internet connection
- e) Quality of electricity supply

Respondents rated these items on a four-point scale (1=poor to 4=excellent).

2.10.1. Opportunity to Receive Computer Training or Develop Computer Skill

Opportunity to receive computer training or develop computer skill was rated 'fair' by 31% and rated 'good' by 35% of the respondents, but, as Figure 19 displays, 16% found it 'poor'.

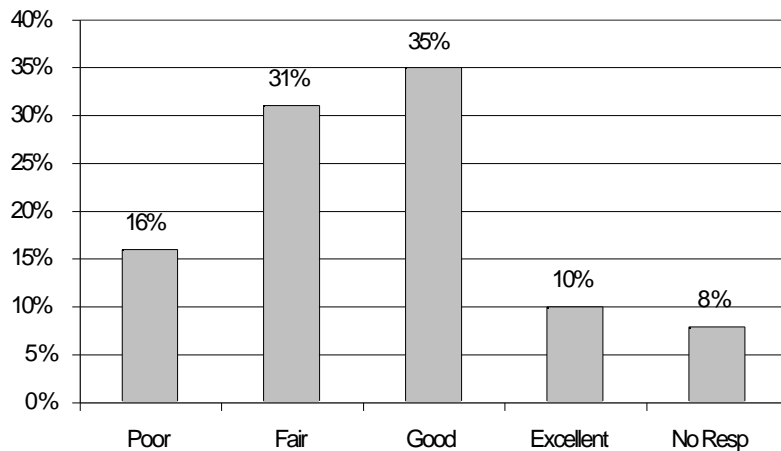


Figure 19. Opportunity for Training

2.10.2. Quality of Computer Training or Skill Development

A majority of respondents rated quality of computer training or skill development favorably. As Figure 20 presents, 18% found it 'poor', but a large majority (73%) found it favorable.

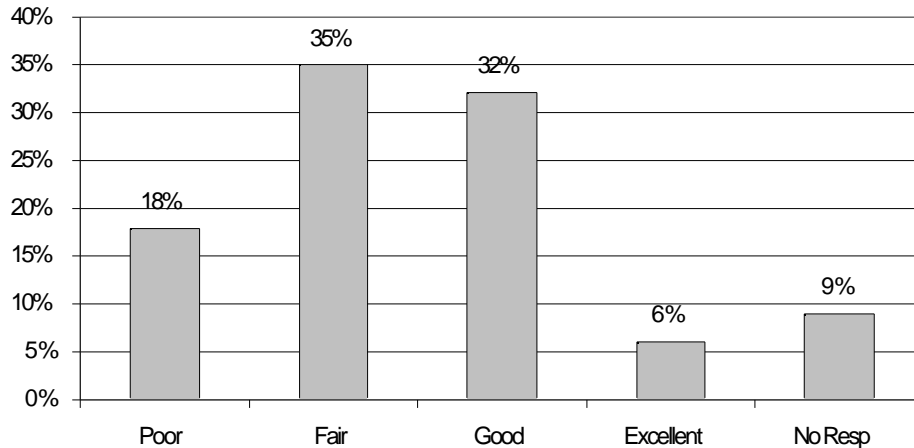


Figure 20. Quality of Training

2.10.3. Quality of Telecommunications Facility, Quality and Reliability of the Internet Connection, and Quality of Electricity Supply

Results are similar with other items—quality of the telecommunications facility, quality and reliability of the Internet connection, and quality of the electricity supply, as Figures 21, 22 and 23 below display respectively. About 15% to 20% of respondents, depending on the item, indicated that the conditions were poor, while a considerable majority found the conditions favorable.

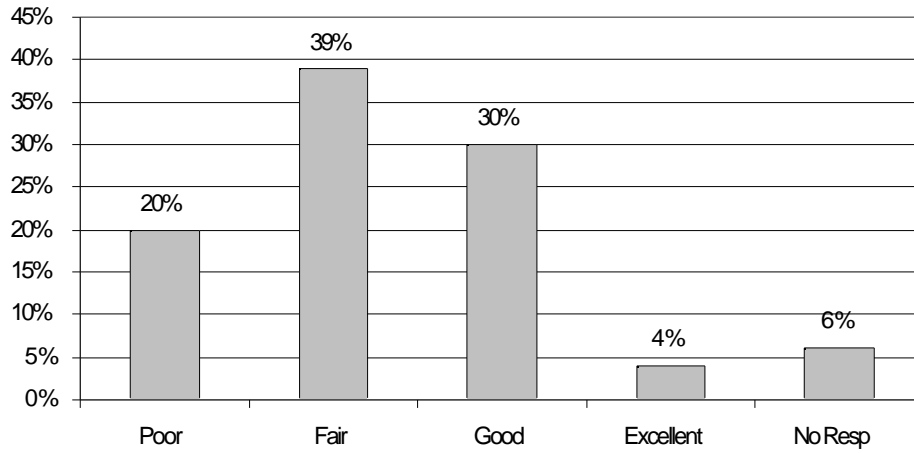


Figure 21. Quality of Telecommunications Facility

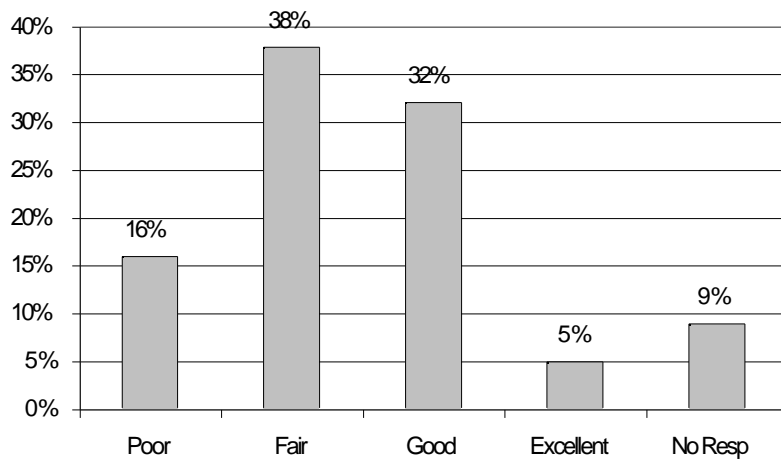


Figure 22. Quality and Reliability of Internet Connection

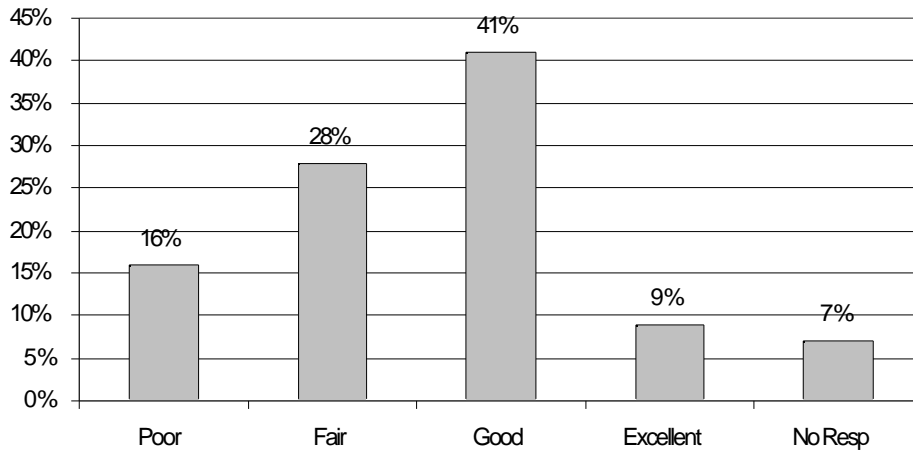


Figure 23. Quality of Electricity Supply

2.11. Cost

Costs include fees and charges for various items. Respondents were asked to rate ISP subscriber fees, current computer hardware and software costs, and telecommunications charges on a four-point scale (1=Low to 4=Very High). A majority of respondents indicated that costs were generally high.

2.11.1. ISP Subscriber Fees

Nearly 46% of the respondents indicated that the subscriber fees were high and only 5% indicated that they were low, as shown in Figure 24.

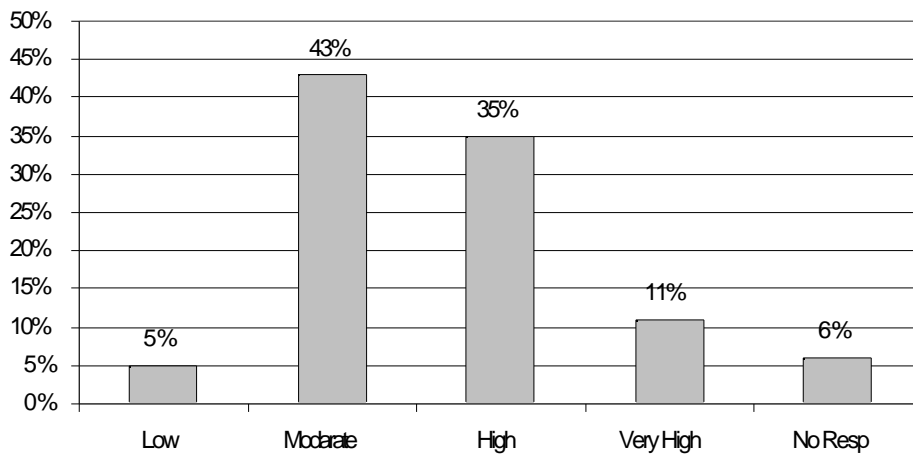


Figure 24. ISP Subscriber Fees

2.11.2. Computer Hardware and Software Costs

As far as other expenses are concerned, a large majority of respondents indicated that the costs were high. Fifty-four percent of the respondents found the current computer hardware costs high, and 60% indicated that the current computer software costs were high, as shown in Figures 25 and 26.

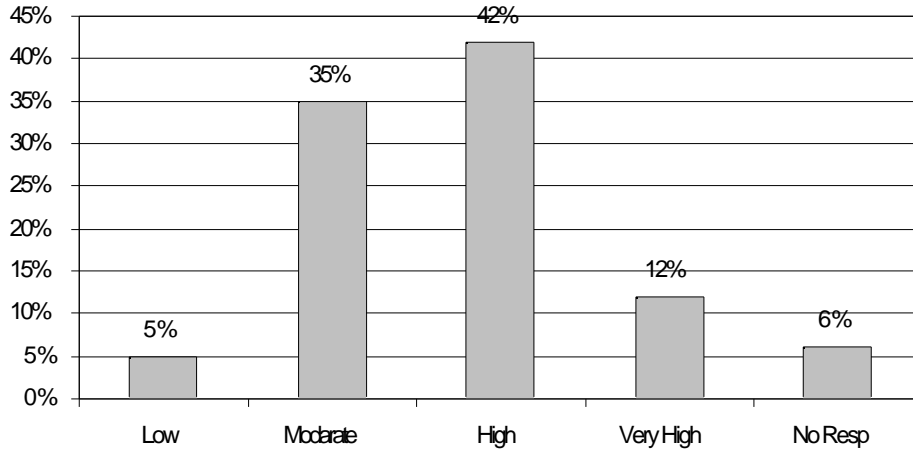


Figure 25. Computer Hardware Costs

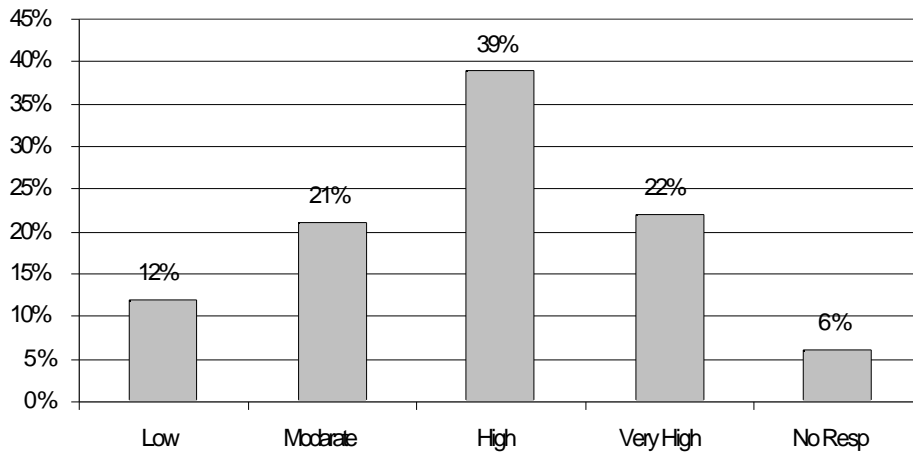


Figure 26. Computer Software Costs

2.11.3. Telecommunications Charges

Cost of telecommunications has been a matter of serious concern for many. An overwhelming majority (77%) rated telecommunications charges as being high or very high, as Figure 27 shows.

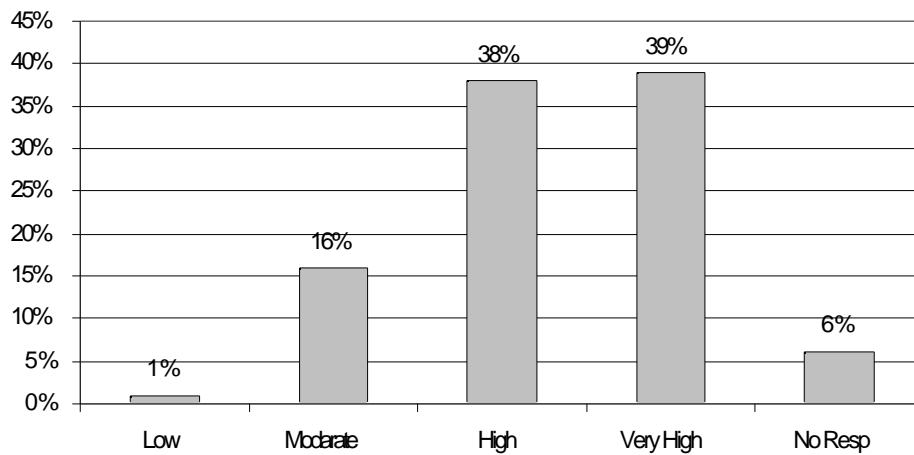


Figure 27. Telecommunications Charges

2.12. Quality of Access to the Internet

The question relating to Internet access focussed on the following items, with respondents rating each item on a four-point scale (1=poor to 4=excellent):

- a) Technical support
- b) Quality of manuals and software installation
- c) Ability to connect and maintain connection
- d) Speed of access to the Internet
- e) Reliability of e-mail

2.12.1. Technical Support

A large majority (78%) of the respondents was positive about the quality of technical support and 15% considered the quality poor, as Figure 28 displays.

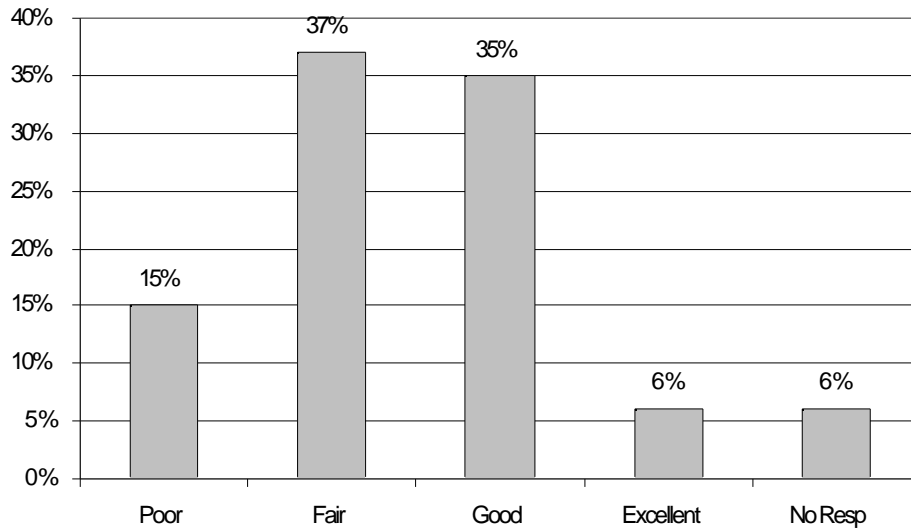


Figure 28. Technical Support

2.12.2. Quality of Manuals and Software Installation

As far as the quality of manuals and software installation was concerned, 19% considered it poor, 4% found it excellent and those who assessed it as 'fair' or 'good' formed a large majority (69%), as Figure 29 presents.

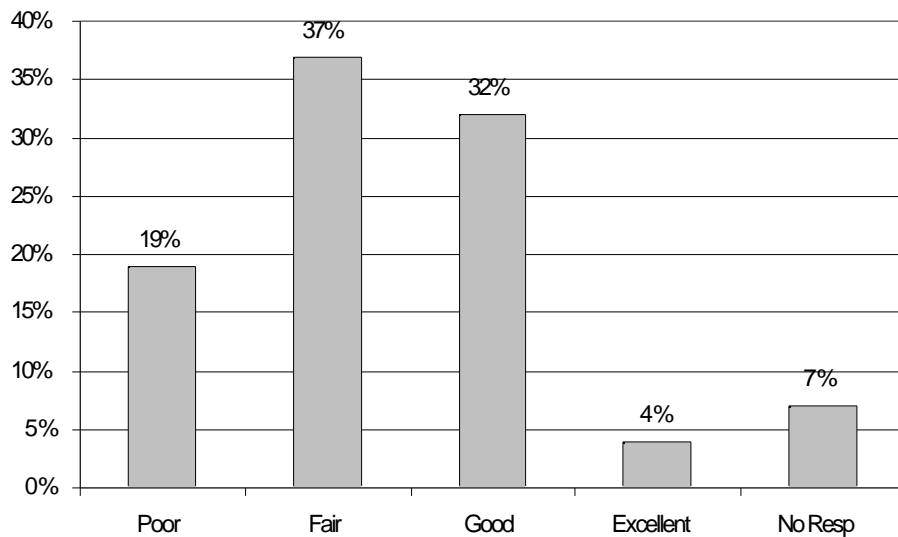


Figure 29. Quality of Manuals and Software Installation

2.12.3. Ability to Connect and Maintain Connection

As shown in Figure 30, respondents rated their ability to connect and to maintain a connection in a similar way as they rated the quality of manuals and software installation.

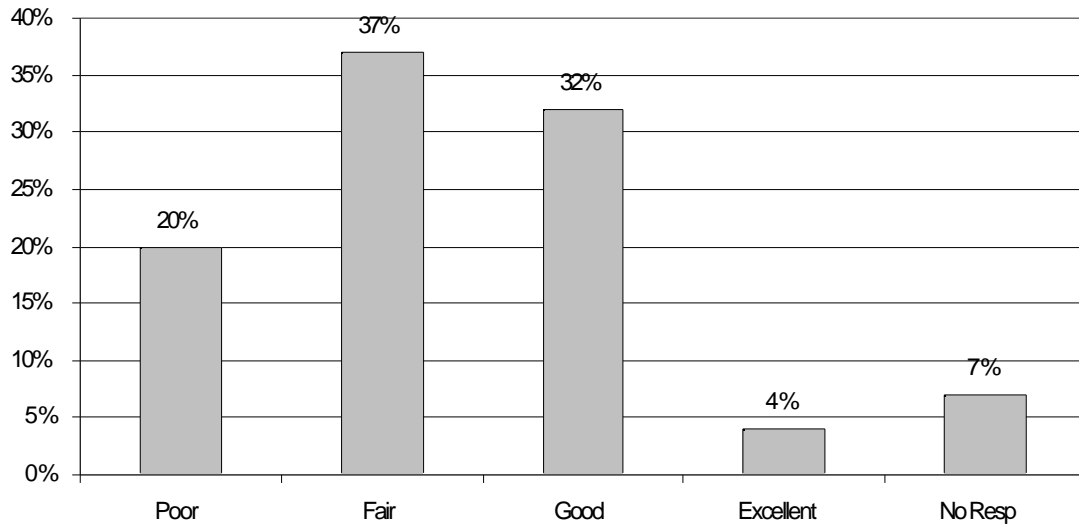


Figure 30. Ability to Connect and Maintain Connection

2.12.4. Speed of Access to the Internet

The speed of access was assessed slightly differently in that 34% of the respondents considered it to be poor. However, a significant majority (54%) were positive when the 'fair' and 'good' response categories were combined, as Figure 31 displays.

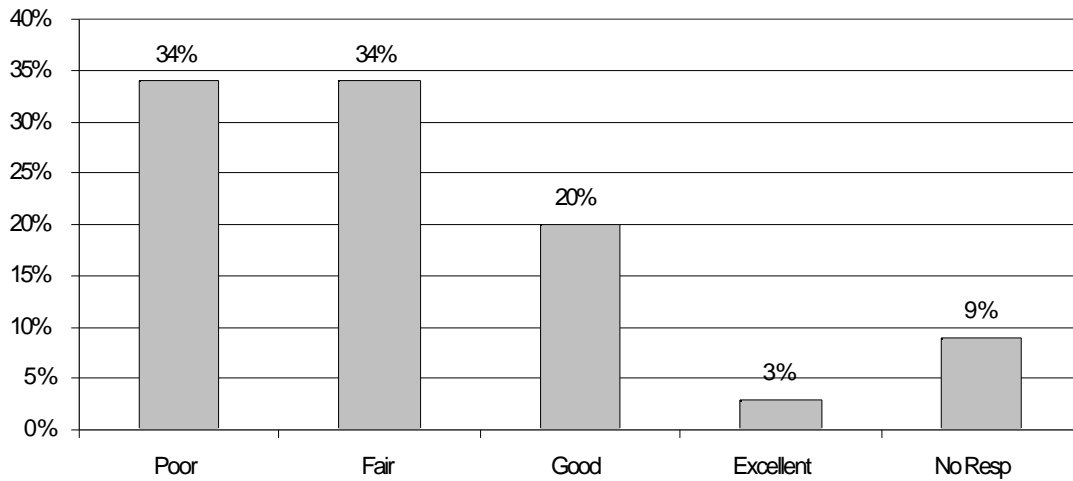


Figure 31. Speed of Access to the Internet

2.12.5. Reliability of E-mail

Nearly 90% of the respondents were positive about the reliability of e-mail, as Figure 32 presents. Only 2% of those who responded rated e-mail reliability as poor.

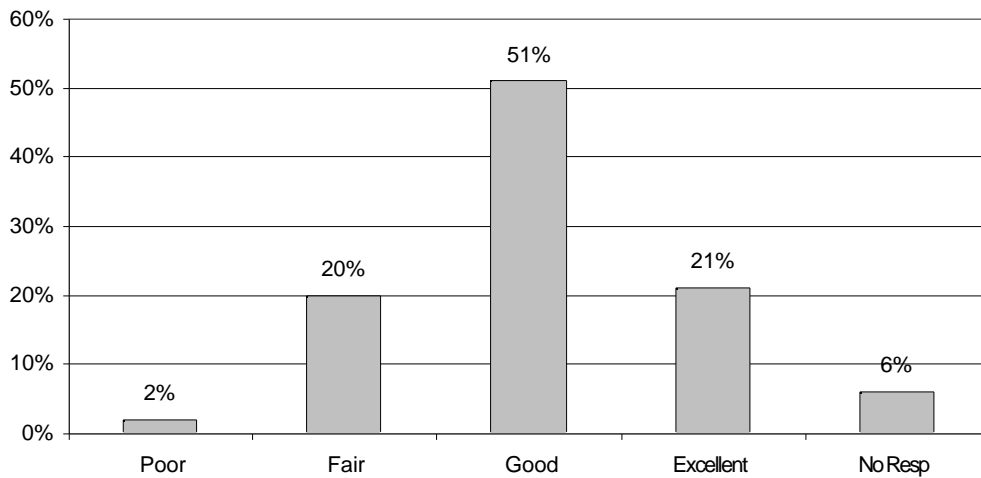


Figure 32. Reliability of E-mail

2.13. Electronic Communication Tools

Respondents were asked to assess the extent to which they used other electronic communication tools in performing their personal/professional work, not including e-mail. The items include:

- a) Telephone
- b) Cell phone

- c) Pager
- d) Fax
- e) Other Communication Devices

2.13.1. Telephone

It was found that almost everyone used the telephone, and 67% of the respondents used it ‘a lot’, as Figure 33 displays.

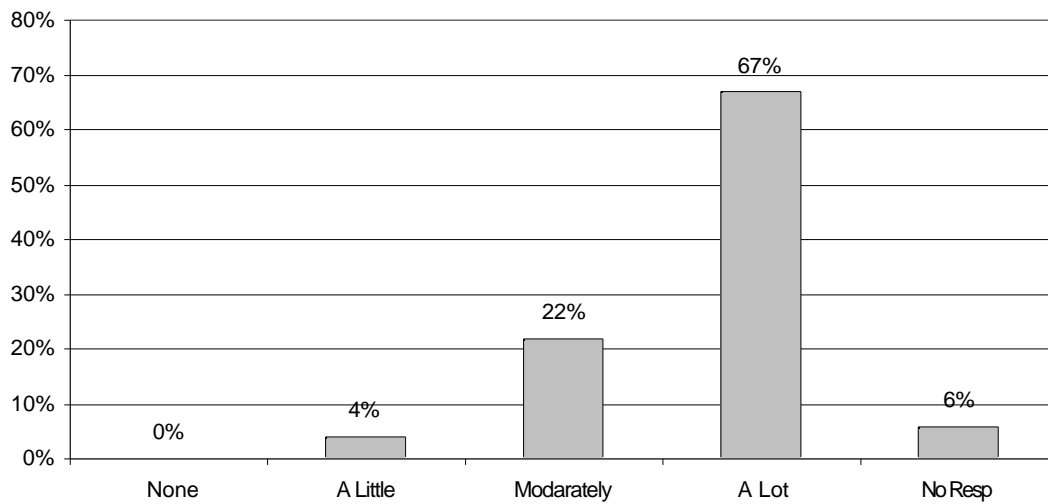


Figure 33. Use of Telephones

2.13.2. Cell phone

As shown in Figure 34, 26% of respondents had not used a cell phone. A minority (18%) had used a cell phone a lot in the process of their personal and professional activity.

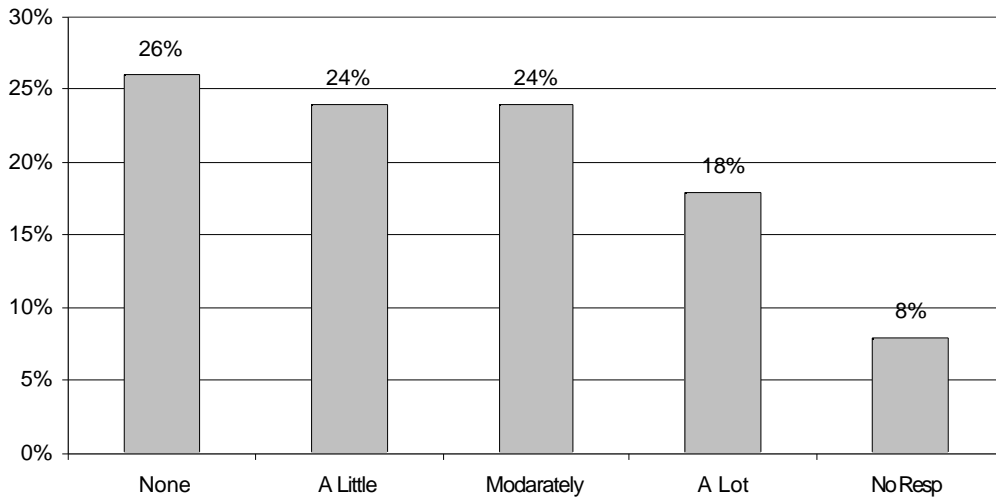


Figure 34. Use of Cell Phones

2.13.3. Pager

Seventy-nine percent of respondents had never used a pager, and only 14% had used one. This is shown in Figure 35.

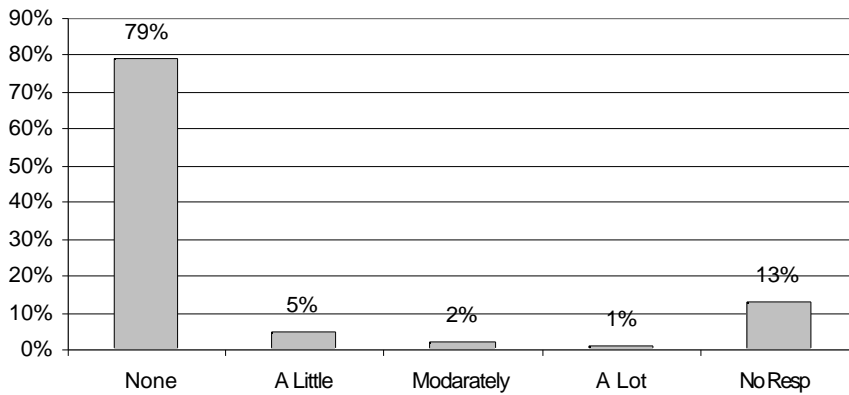


Figure 35. Use of Pagers

2.13.4. Fax

Twelve percent of the respondents had never used fax, while a large majority (80%) had used it to a greater or lesser extent (see Figure 36.)

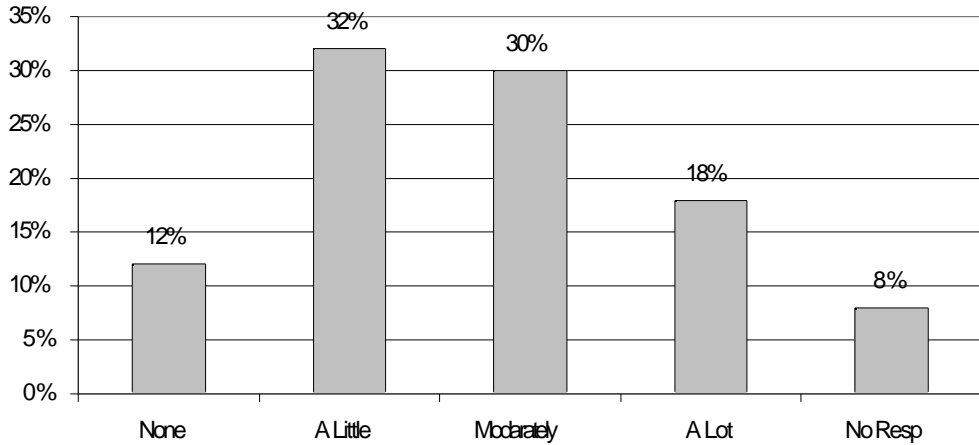


Figure 36. Distribution of Fax Among ISP Members

2.13.5. Other Communication Devices

Only 4% of the respondents had used other communication devices, as Figure 37 shows.

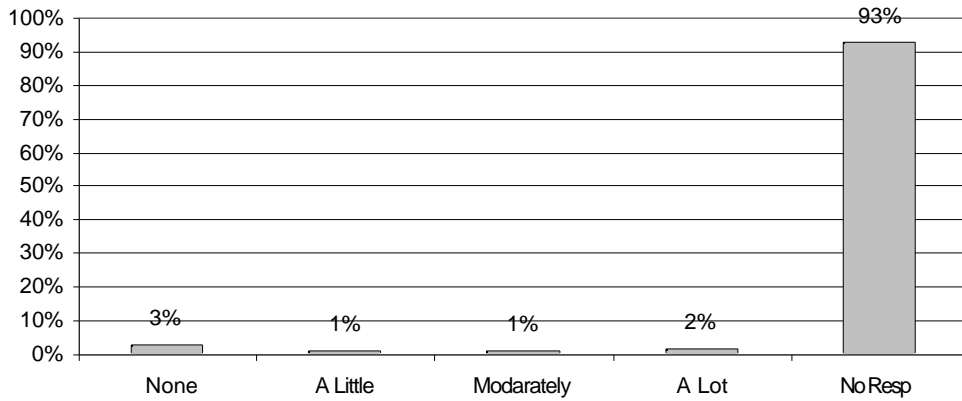


Figure 37. Use of Other Communication Devices

2.14. Purpose of Use of E-mails, Web pages and Other Internet-based Features

Respondents were asked to indicate the extent to which their use of e-mails, Web pages and other Internet-based features were related to the following:

- a) Business
- b) Government
- c) Communication with friends and other individuals via e-mail
- d) Being part of mailing lists
- e) Professional associations
- f) Career development
- g) Domestic and international news

2.14.1. Use of E-mails, Web Pages and Other Services for Business

Respondents who indicated that they had used e-mails, Web pages and other Internet-based features at various levels in connection with business formed an overwhelming majority (74%), as Figure 38 displays.

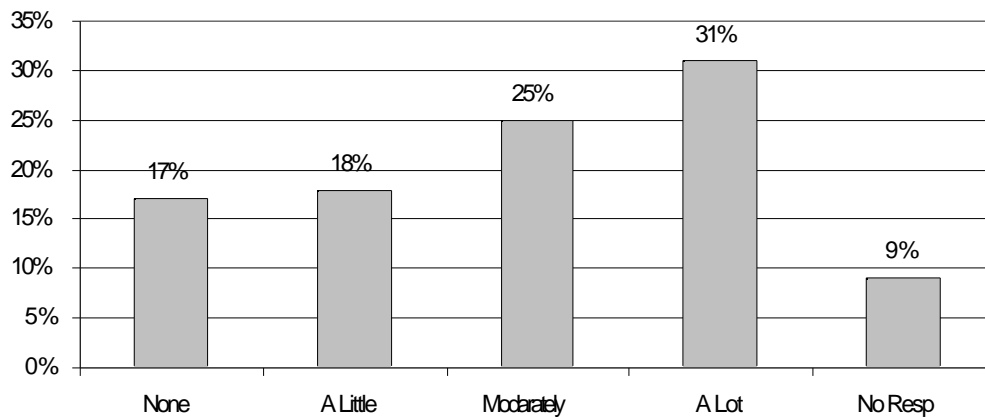


Figure 38. Use of E-mails, Web Pages and Other Services for Business

2.14.2. Use of E-mails, Web Pages and Other Services for Government

Those who used these features for activities related to government formed a small minority (8%), a combined total of moderate and heavy users, as Figure 39 shows. But a combined total of non-users and those who used a little formed an overwhelming majority of the respondents (80%).

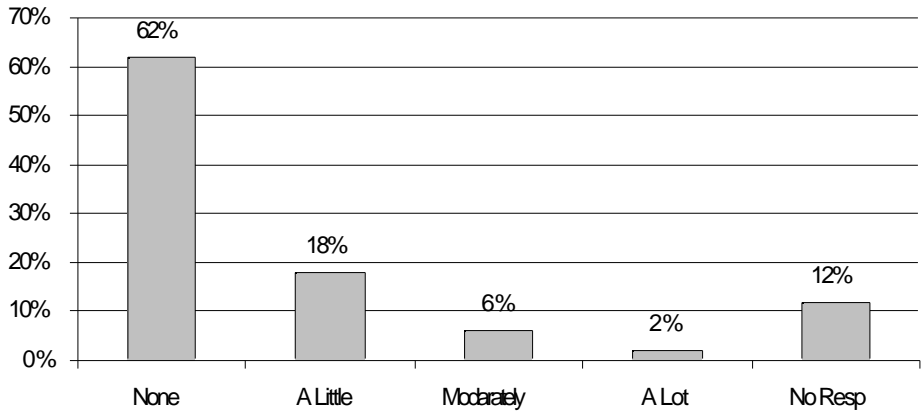


Figure 39. Use of E-mails, Web Pages and Other Services for Government

2.14.3. Communication via E-mail

Over 90% of the respondents indicated using e-mail at various levels to communicate with friends and other individuals, as Figure 40 portrays.

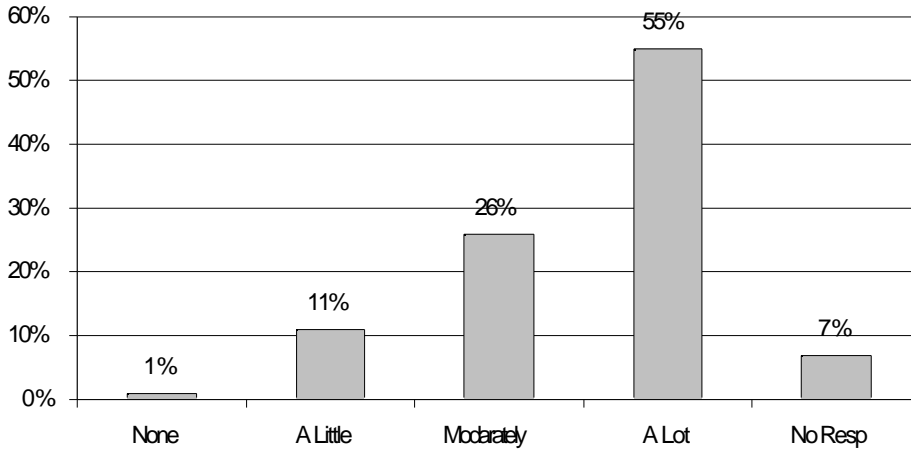


Figure 40. Communication via E-mail

2.14.4. Subscription to Mailing Lists

A large majority of respondents (64%) indicated that they were part of mailing lists at some level, as Figure 41 portrays.

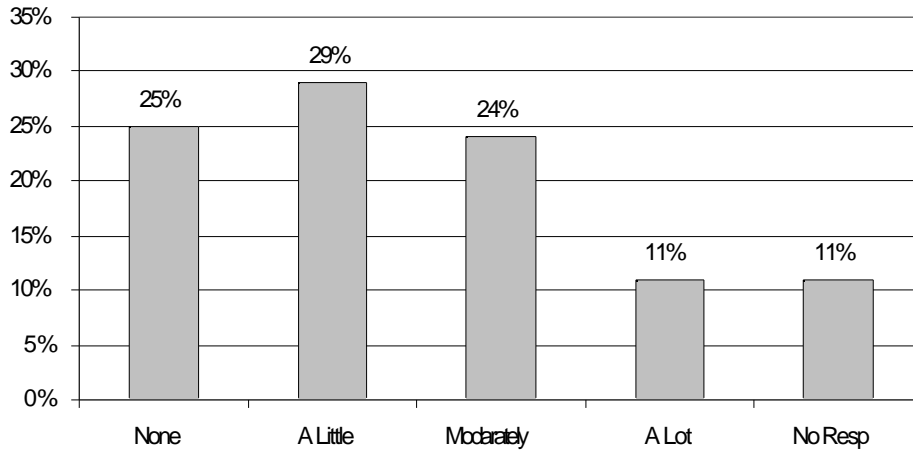


Figure 41. Distribution of Subscription to Mailing Lists

2.14.5. Use of E-mails, Web Pages and Other Services for Professional/Personal Development and for Domestic and International News

Similarly, a large majority of respondents had used e-mails, Web pages and other Internet-based features at some level for professional development (Figure 42), career development (Figure 43) and domestic and international news (Figure 43.)

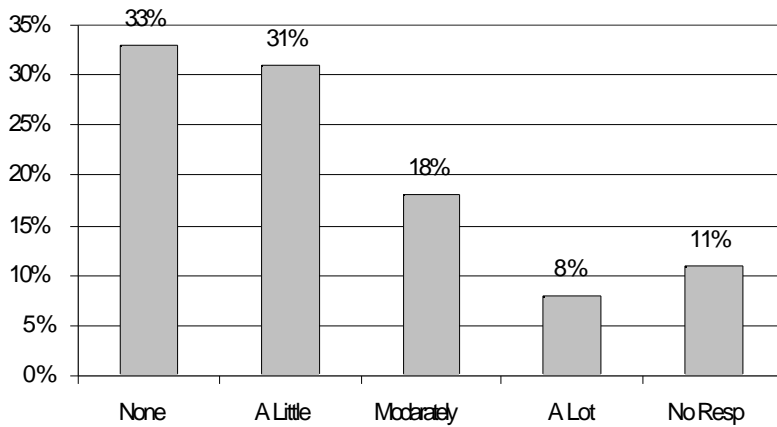


Figure 42. Use of E-mails, Web Pages and Other Services for Professional Development

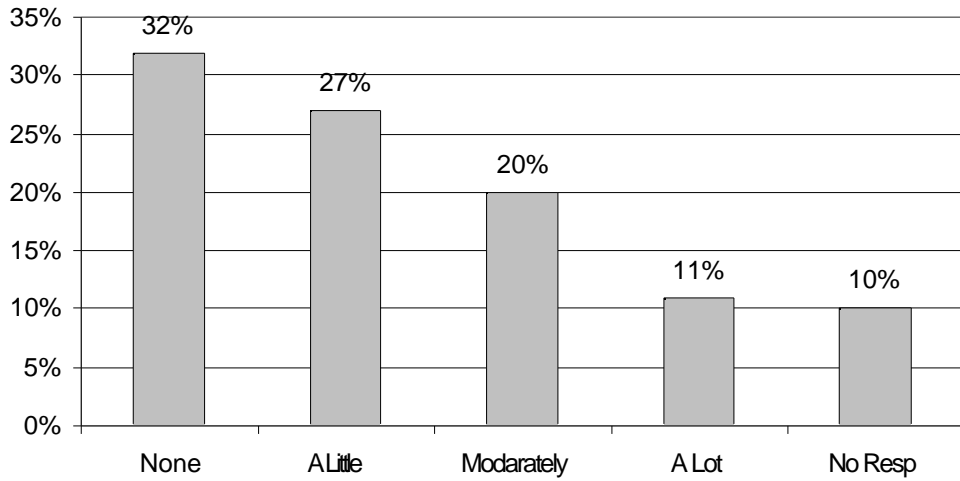


Figure 43. Use of E-mails, Web Pages and Other Services for Career Development

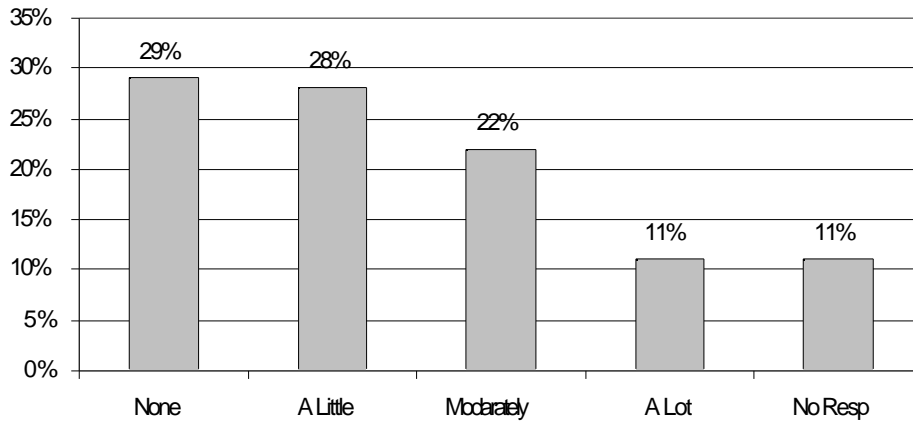


Figure 44. Use of E-mails, Web Pages and Other Services for Domestic and International News

2.15. Benefits from Access to the Internet

One question considered a number of ways that people could benefit from Internet access. Semantic differential scales, each of which is a seven-point continuum bounded at its extremes by a bipolar adjective pair, were used for each of the following factors:

- a) Creation of new markets for services and products
- b) Better prices for services and products
- c) Communication efficiency through e-mails, etc.
- d) Availability of information resources for personal and professional use
- e) Opportunity to publish and be heard
- f) Communicate with family and friends outside Sri Lanka
- g) Other

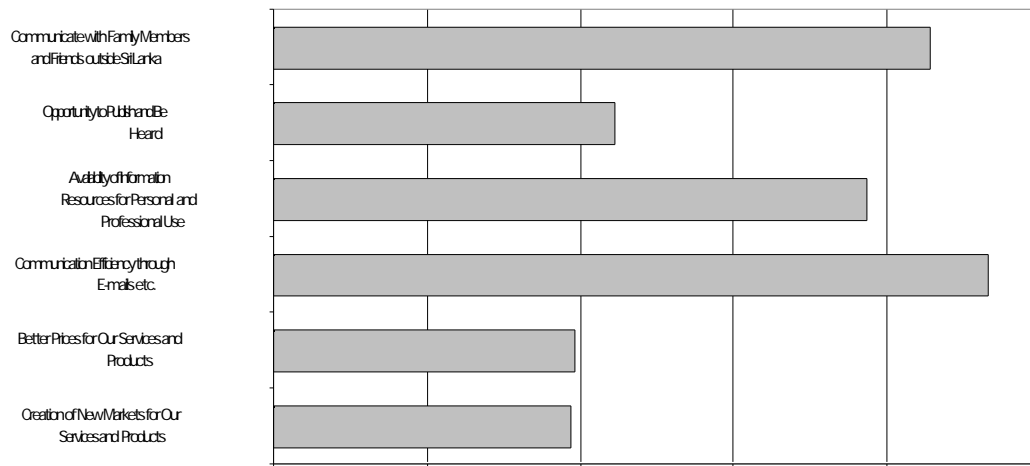


Figure 45. Weighted average of the benefits from access to the Internet

From the quantitative ranking of importance of each benefit, Figure 45 provides a weighted average of the benefits from access to the Internet. Communication efficiency and ability to communicate with family and friends were regarded as the most important benefits.

For the following graphs, the number "1" indicates that the factor is among the least important and the number "7", the most important. For our analysis, responses 1 and 2 were combined at the lowest continuum that indicated not important, and responses 6 and 7 were combined at the highest continuum that indicated quite important. The responses in the middle and near middle--represented by 3, 4 and 5 numbers--are generally assumed to indicate somewhat or a little important.

2.15.1. Creation of New Markets

Analysis of results related to the creation of new markets for services and products shows that 22% found access to the Internet not important and almost the same fraction (23%) found it quite important, as Figure 46 displays.

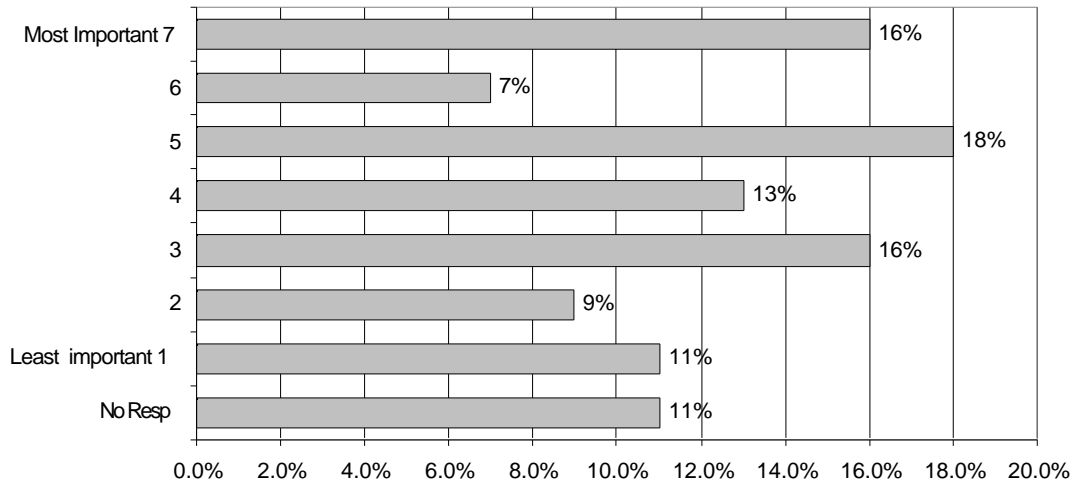


Figure 46. Creation of New Markets

2.15.2. Better Prices for Services and Products

Analysis of results related to better prices for services and products shows that 25% of the respondents found it not important and the same fraction found it quite important, as Figure 47 portrays.

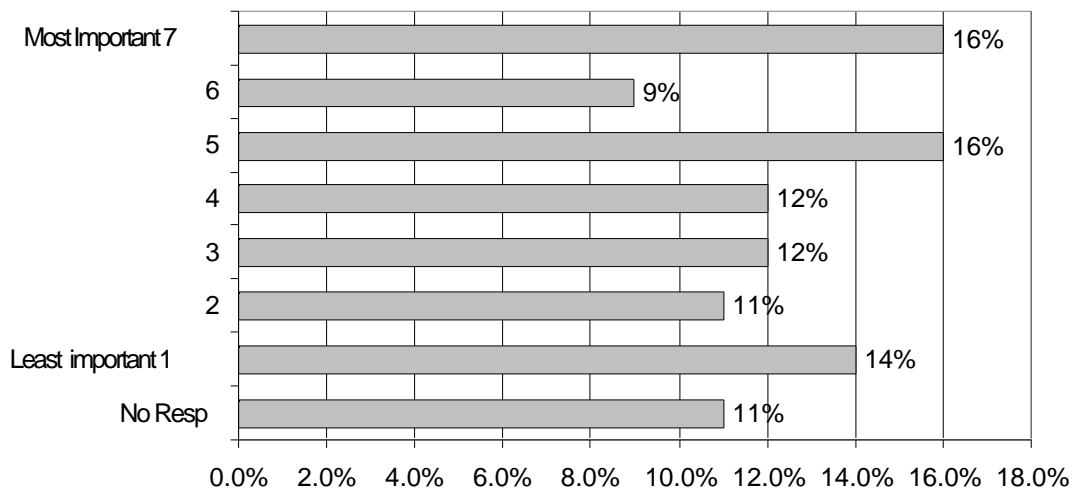


Figure 47. Better Prices for Services and Products

2.15.3. Communication Efficiency through E-mails etc.

As shown in figure 48, a large portion (72%) of the respondents indicated that communication efficiency through e-mails was quite important, while only 2% indicated that it was not important.

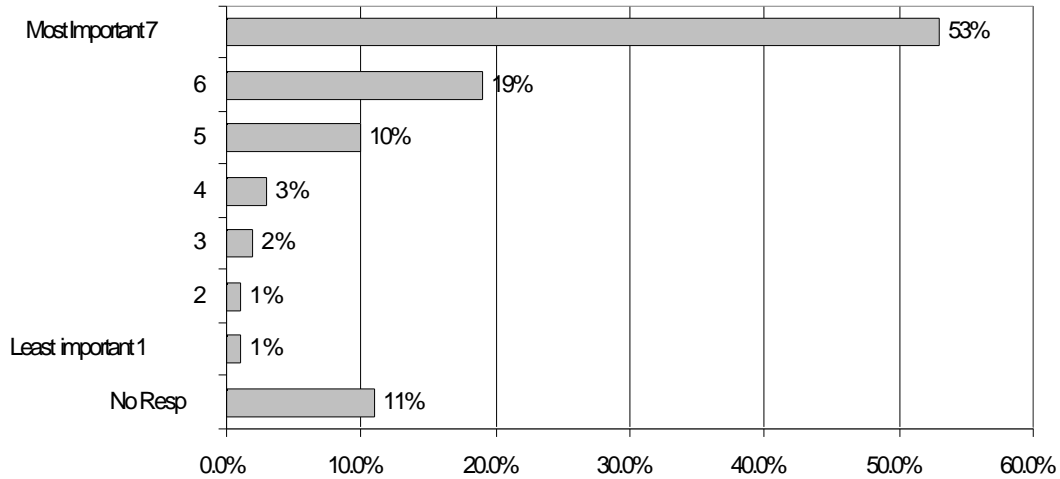


Figure 48. Communication Efficiency

2.15.4. Availability of Information Resources for Personal and Professional Use

Analysis of results related to the availability of information resources for personal and professional use shows that a large percent (55%) of respondents found it quite important as opposed to only 4% who considered it not important, as Figure 49 shows.

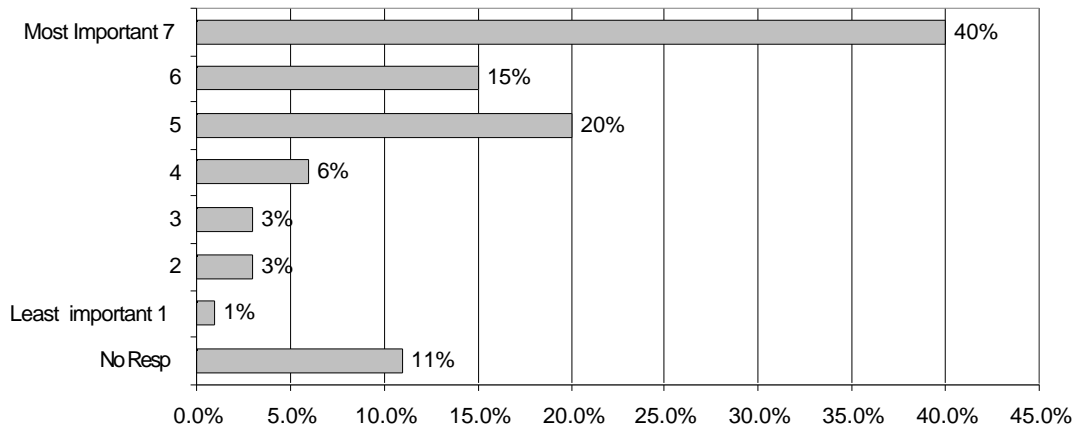


Figure 49. Availability of Information Resources

2.15.5. Opportunity to Publish and Be Heard

Results related to the opportunity to publish and be heard show that 16% found it not important as opposed to 30% of the respondents who found it quite important, as Figure 50 displays.

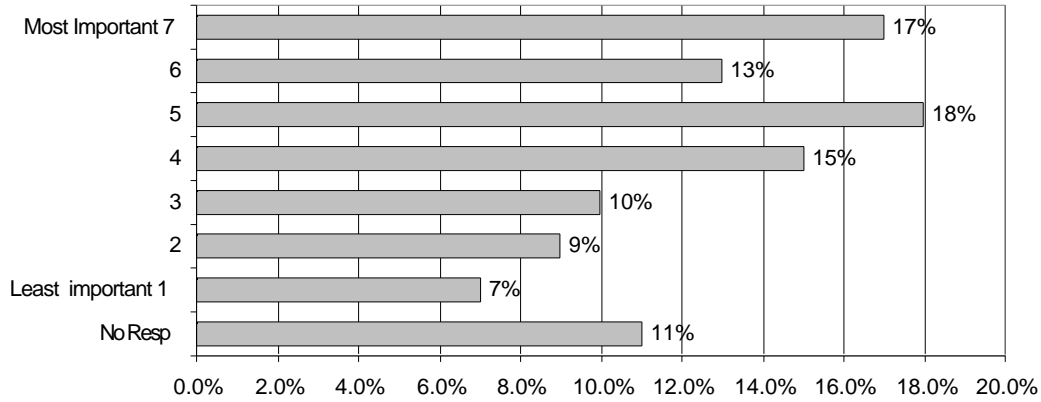


Figure 50. Opportunity to Publish and be Heard

2.15.6. Communication with Family and Friends

Analysis of results related to communication with family and friends outside Sri Lanka shows that a large percent (65%) of respondents found it quite important as opposed to only 4% who considered it not important, as Figure 51 displays.

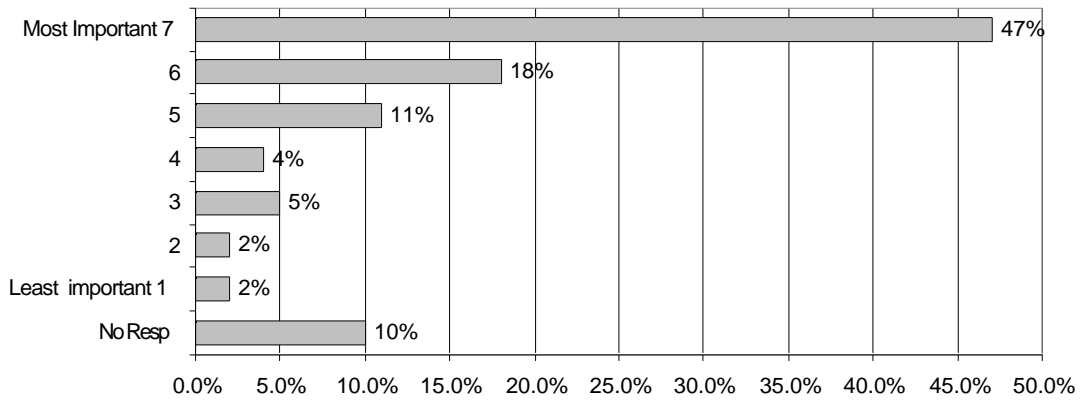


Figure 51. Communication with Family Members and Friends

Chapter III: Qualitative Data Analysis

Respondents were asked four open-ended questions for qualitative assessment of the use of computers and the Internet in Sri Lanka. Questions concerned:

- a) Initiation of new activities as a result of ISP membership
- b) Perspective on the Internet-based ISP services useful for business, professional activities or education
- c) Perspective on ways to use computing and communications for various local activities in the country
- d) General perspectives

This section presents an account of the qualitative data analysis related to the use of computers and the Internet in Sri Lanka. ISP members' perspectives were derived inductively from their responses to a few open-ended questions posed somewhere in the middle and end of the questionnaire. Members' responses were framed into different categories to represent themes or patterns.

3.1. Initiation of New activities as a Result of ISP Membership

Respondents were asked what new things they were able to do that they did not or were not able to do before they joined their ISP. Members' responses were analyzed according to specific themes, subjects or areas and were broadly placed into four categories:

- a) Faster access to information
- b) Increased efficiency in business, professional and organizational activities
- c) Increased communication at low costs
- d) On-line education and training

3.1.1. Faster Access to Information

Faster access to information was identified as a new and important activity. A number of respondents described that they were able to have more and faster access to information on a variety of topics and areas. Information on health, business, employment, latest news, world events, technology, markets and other developments were highly useful, according to them. One respondent found that journalism had taken a new turn as the *"opportunity to read uncensored news"* had finally arrived. Faster access to information was indicated by opportunities *"to download"* data and information, music, video and images, in addition to

information on a plethora of subjects, including *the "new movements on the arts scene"*. One respondent was even able to *"assist in the planning and construction of fish farms in Africa and collect new information on fish diseases and nutrition"*.

3.1.2. Increased efficiency in Business, Professional and Organizational Activities

Efficiency in business and professional activities was identified as one of the most crucial attributes of the beginning of the Internet age in the country. A large number of respondents expressed that they were, as a result of their ISP membership, able to improve efficiency in their otherwise slow-moving business. Where sending orders and receiving confirmations took a long time in the past, today, as one member put it, *"I was able to make decisions, place orders for things I needed and receive confirmations instantly."* Another respondent *"was able to publish information about our products on the Web for the first time."* A few respondents were able to explore new business opportunities. One member put it: *"Simply speaking, my business will not survive without the Internet."* A number of respondents described that they had opportunities to look at international on-line journals, visit libraries and databases and consult foreign publications. A few indicated their ability to carry on official communication with organizations overseas. One respondent found *"forwarding information to officers in my organization without delay"* was excellent.

3.1.3. Increased Communication at Low Costs

Many respondents found access to the Internet helpful in many ways. It facilitated faster communication, increased local and long-distance contacts through the Web and e-mail, and increased the speed of data and information transfer. An overwhelming majority of the respondents indicated that access to Internet-based services provided them with a better and cheaper way of communicating with family and friends and professional and business associates both inside and outside the country. One of them put it:

I acquired new ability to overcome barriers in terms of delay, high costs and hassles posed by, or inherent in, traditional mail and communication systems such as plain old telephones and facsimiles in the country.

Another respondent *"was able to keep in touch with people outside office hours while traveling or away from home or office."* Similarly, one of them found it easy *"to achieve much more as a result of improved connection speed and continuity of connection."* Another noted:

I can now send drafts of my work for comment and correction to clients and get feedback through e-mail.

One respondent went as far as to say:

I'm not communicating through snail-mail anymore.

3.1.4. On-line Education and Training

A number of respondents indicated that their education benefited as a result of joining various mailing lists, user groups and on-line discussions. A few respondents were able to participate in on-line education and training programs.

In contrast, some respondents found that they were not able to do any new things by subscribing to their ISP.

3.2. Perspective on the Internet-based ISP Services Useful for Business, Professional Activities or Education

Respondents were asked if there was any service useful for their business, professional activities or education that they wished could be provided using the Internet and supported by their ISP. Members' responses were broadly combined into five categories:

- a) Low bandwidth
- b) High telecommunications charges
- c) General quality of Internet service
- d) Need for organized information and databases
- e) E-commerce

3.2.1. Low Bandwidth

A number of respondents were concerned about the low bandwidth that serves as a bottleneck for Internet progress. ISPs should make efforts to increase their bandwidth in order to improve response time on the Internet. One respondent pointed out that narrow bandwidth had been a matter of perennial concern. Opinion was also expressed as to the need to explore the possibility of "*broadband access that will improve voice communication and television broadcast over the Net.*" One respondent felt the need for high-speed data transfer and reliable videoconferencing. Some others felt satisfied with what they already had in the low bandwidth environment. For example, one respondent put it:

Right now, I think we have almost everything we need for business and professional activities.

3.2.2. High Telecommunications Charges

A number of respondents expressed concern about the prohibitively high telephone and Internet service charges based on the quality of services the service providers are offering. One respondent observed:

Telephone and Internet service costs are very high. I, therefore, do not even make use of all the facilities that presently exist.

A few respondents indicated that their ISPs' low capacity has restrained them from being a part of many Usenet and News Groups. A few respondents noted that Internet-based telephone service could drive the cost down. One ISP member commented that provision of unlimited access for a low flat fee per month works better. Another put it:

In absolute terms, Internet charges are VERY high and this would no doubt deter many people from getting Internet and/or e-mail access.

3.2.3. General Quality of Internet Service

A few respondents indicated that poor and unreliable connection speed, failure to connect despite repeated attempts, and poor web hosting and web applications are problems that deserve attention. Faster connection, fewer busy signals and better customer support are necessary, according to one respondent. A number of respondents expressed concern about the quality and limited capacity of their ISP and expressed the need to improve fax transmission capability via the Internet. One respondent was concerned with the current security, privacy and virus protection mechanism and poor e-mail system to open attachments.

3.2.4. Need for Organized Information and Databases

Several respondents indicated that their ISP should, following the practice established by America On-Line and others, provide organized information and databases on various subjects, including specific databases to address the country's needs in agriculture, trade, industry, medical literature and tourism. One respondent expressed the need for more information on free software, as well. One ISP member even felt the need for the development of a virtual or digital library containing information on various subjects and areas related to Sri Lanka in cooperation with a good university like MIT.

3.2.5. E-commerce

A number of respondents indicated the need to enhance capacity that can handle e-commerce. They were concerned that the development of e-commerce applications using the Internet was still very slow and poor in the country. One respondent observed:

Introduction of IT in banking sector is necessary. Internet banking and bill-paying facilities such as 'Bpay' in Australia can be very helpful.

3.3. Perspective on the ways in which Computing and Communications Can be Used to Support Activities at the Local Level

Respondents were asked to express their perspective on the ways in which computing and communications can be used to support activities (such as business, various trades, agriculture, industry, including Web-based services) at the local level in the country. Respondents identified a variety of needs that must be addressed. Their responses were broadly placed into five categories:

- a) Awareness raising
- b) Change in current regulatory environment
- c) Open government
- d) Education, training and skill building
- e) Local information resources to support commerce

3.3.1. Awareness Raising

A number of respondents indicated that computing and communications tools or media should be used to make people aware of what is possible or what can be done to support economic, commercial and other activities at the local level. People in the information technology sector are the ones who should, in cooperation with concerned government agencies, spearhead awareness raising campaigns at the local level.

3.3.2. Change in Current Regulatory Environment

Many respondents pointed out that change is needed in the law, rules and regulations governing information and communication services and activities in the country. This should be done with a view to, among others, bringing down prices and charges associated with activities in the IT sector. Some respondents felt concerned with the trend that shows more concentration of IT services in cities and towns. They indicated that measures must be taken to expand telecommunications networks to rural areas as well.

3.3.3. Open Government

A few of the respondents expressed concern that the public access to information is limited. Information generated by various government departments and agencies related to health, agriculture, trade and commerce, education and other areas must be made available to the public. One respondent recommended that ISPs develop mechanisms to include *"information on government regulations, policies and programs that are relevant and useful to the public."* One important way would be to set up telecenters or community

information centers under the government where people can come in to send or receive messages, according to another respondent.

3.3.4. Education, Training and Skill Building

Many respondents indicated that major emphasis must be placed on the further development of IT education, training and various skill-building programs without which the IT sector cannot survive in the country. One member put it:

I believe our extremely low labor and infrastructure costs could be used as an advantage to create a base here to run Web business or e-commerce operations.

3.3.5. Local Information Resources to Support Commerce

Emphasis on the establishment and development of local information resources figured prominently among a number of respondents. In addition to the need for open government, they viewed there is a need for information or databases related to trade and commercial activities at the local level. One respondent pointed to the growing need for IT-based innovative programs to address commercial and business needs. A few indicated that systems must be developed to allow payment by credit cards, in the absence of which a lot of business transactions cannot take place. Several respondents indicated that better ways must be found to provide farmers, traders and industrialists with the type of information they need most such as prices for their products in international markets and innovative methods of carrying out work in their field of activity.

3.4. General Perspectives

Finally, respondents were asked to express additional comments, suggestions or recommendations concerning computing and the Internet in Sri Lanka. Analysis of most responses to this open-ended question shows that they reinforce some of the themes presented already above. Figuring prominently in many responses was the need for faster and higher-quality access; higher bandwidth; a change in the regulatory environment to lower costs and encourage participation by the private sector; more education, training and skill building; organized information and databases; a focus on e-commerce; an emphasis on IT development in rural areas; and open government.

There was also an undercurrent of concern among many respondents about the state of weak information and telecommunications infrastructure in the country. They were concerned that access to information technology is mostly concentrated in the capital and a few other cities, widening gaps between the rich and poor. Proper mechanisms must be developed, in their opinion, to address needs of the people in the rural areas where a large segment of the population lives.

Chapter IV: Conclusion

Major findings of this survey indicate that use and application of computers and the Internet is increasing considerably in Sri Lanka. With the rise in IT use, one notices many challenging issues and concerns associated with computing and communications surfacing in this island. Access is a problem. The number of people who have access to these technologies is severely limited. While it is true that new IT and other associated technologies are multiplying in some places, particularly in urban areas, considerable efforts are needed to increase access in rural areas where a vast majority of population lives. New advances in information and communications technology have opened up great opportunities for development in low-income countries, but many serious challenges remain in increasing the speed at which opportunities created by technology can be seized. A close understanding of the IT situation in developing countries can be very helpful in this process, indeed. This study is only a very small step in this direction. And much remains to be done.

Appendix : The Questionnaire

PERSPECTIVES ON THE USE OF COMPUTERS AND THE INTERNET IN SRI LANKA
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This survey, initiated by the Laboratory for Computer Science at Massachusetts Institute of Technology, U.S.A., is part of a broad study of information technology use in developing countries. This study attempts to look at the use of computer and the Internet among ISP members in Sri Lanka. Through the survey we expect to improve our understanding of information technology use in a developing country setting.

It will take only a few minutes. We assure you that your personal answers will be kept confidential. Your contribution to our knowledge of this subject will be valuable and provide guidance to future service offerings, policy-making, operating practices and procedures related to the Internet service in particular, and information technology use in general.

Please respond to this survey on (or before) July 30, 1999. Please fill the spaces within square brackets [] with your answers, but do not change or delete the text outside the brackets. After you have completed please return it via e-mail to: <survey@cag.lcs.mit.edu>. We appreciate your valuable assistance in this study.

Also, please note that three individuals from among the participants in this survey will be randomly selected as winners in a raffle on July 30, 1999. Each of the winners will receive a copy of the book "What Will Be" by Professor Michael Dertouzos. Detailed, accessible, and visionary, Dertouzos's "What Will Be" maps out the future and, according to Bill Gates, "provides valuable insights on how information technology will transform our lives and our world in the new century."

About the Laboratory for Computer Science (LCS)

The Laboratory for Computer Science (<http://www.lcs.mit.edu>) at the Massachusetts Institute of Technology is an interdepartmental laboratory that brings together faculty, researchers, and students within MIT in a broad program of study, research, and experimentation. Founded in 1963, LCS has been responsible for some of the world's most significant technological achievements of the past few decades. The members and alumni of LCS have been instrumental in the development of the ARPANet, the Internet, the Ethernet, the World Wide Web, time-shared computers, spreadsheets, RSA encryption, and dozens of other technologies. In addition, LCS research has spawned over three dozen companies, including 3Com Corporation, Cirrus Logic, Inc., Lotus Development Corporation, Open Market, Inc., and RSA Data Security, Inc. The Laboratory currently runs the World Wide Web Consortium, which sets the standards for the World Wide Web.

Question 1. Please type the name of your current Internet Service Provider (ISP) within square brackets [] below .

[]

Question 2. As you recall, how long have you been member of this ISP?

- 1) 6 Months or Less
- 2) 7 Months to 1 Year
- 3) 13 Months to 17 Months
- 4) 1 and a Half Years to 2 Years
- 5) Over 2 Years

Please type (within square brackets) below the number that indicates the length of your membership with your ISP.

[]

Question 3. In what year did you first use a computer? Please type the year (in two digits) in space (within square brackets).

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Question 4. On the average over the past six (or less) months, about how many e-mails per week did you send?

- 1) Less than 4
- 2) 5 to 9
- 3) 10 to 14
- 4) 15 or More

Please type the number of your choice in space (within square brackets) below.

[]

Question 5. On the average over the past six (or less) months, about how many e-mails per week did you receive?

- 1) Less than 4
- 2) 5 to 9

- 3) 10 to 14
- 4) 15 or More

Please type the number of your choice within square brackets below.

[]

Question 6. Where do you currently use a computer?
Select one (or more) that applies.

- 1) Office
- 2) Home
- 3) Other (Please specify) []

Please type the number of your choice (separated by comma, if more than one is selected) within square brackets below.

[]

Question 7. Other than the E-mail, what other Internet services have you used?

- 1) World Wide Web
- 2) Telnet
- 3) Usenet News Groups
- 4) Chat
- 5) FTP or Other File Transfers
- 6) Publishing Information on the Web
- 7) Other (Please specify) []

Please type the number(s) of your choice (separated by comma, if more than one is selected) within square brackets below.

[]

Question 8. Please indicate the current baud rate or speed at which you are connecting to your ISP.

- 1) 1200 or Lower
- 2) 9600
- 3) 14400
- 4) 28800
- 5) 33600
- 6) 56K
- 7) 64K
- 8) 128K
- 9) 256K
- 10) 512K or Higher

a) Opportunity to Receive Computer Training or Develop Computer Skill

[]

b) Quality of Computer Training or Skill Development

[]

c) Quality of Telecommunications Facility

[]

d) Quality and Reliability of the Internet Connection

[]

e) Quality of Electricity Supply

[]

Question 11. How do you generally rate the following?:

Rating Scale: 1=LOW; 2=JUST ABOUT RIGHT; 3=HIGH and 4=VERY HIGH

Please rate each of the following items by typing the number of your choice in space (within square brackets) following each item below .

a) ISP Subscriber Fees You Are Currently Paying

[]

b) Current Computer Hardware Costs

[]

c) Current Computer Software Costs

[]

d) Telecommunications Charges

[]

Question 12. How do you generally rate the following?

Rating Scale are: 1=POOR; 2=FAIR; 3=GOOD and 4=EXCELLENT

Please type the rating number of your choice in space
(within square brackets) following each item below .

a) Technical Support

[]

b) Quality of Manuals and Software Installation

[]

c) Ability to Connect and Maintain Connection

[]

d) Speed of Access to the Internet

[]

e) Reliability of E-mail

[]

Question 13. These questions are about the extent
to which you use other electronic communications tools.
To what extent do you use each of the following
tools in performing your personal/professional work?

Rating Scale: 1=NONE; 2=A LITTLE; 3=MODERATELY and 4=A LOT

Please type the rating number of your choice in space
(within square brackets) following each item below .

a) Telephone

[]

b) Cell Phone

[]

c) Pager

[]

d) Fax

[]

e) Other (Please specify) []

Question 14. E-mails, Web pages and other Internet-based features are increasingly used to serve various purposes. Please indicate the extent to which your use of Internet service is related to each of the following:

Rating Scale: 1=NONE; 2=A LITTLE; 3=MODERATELY and 4=A LOT

Please type the rating number of your choice in space (within square brackets) following each item below.

a) Business

[]

b) Government

[]

c) Communication with Friends and Other Individuals
(via Emails)

[]

d) Being Part of Mailing Lists

[]

e) Professional Associations

[]

f) Career Development

[]

g) Domestic and International News

[]

Question 15. Below are some of the factors that might be used to describe benefits gained from one's access to the Internet. Please indicate the importance you attach to each factor when you think about accessing the Internet.

Let the number (1) indicate that you think that the factor is among the least important and the number (7) is among the most important. Some numbers between these extremes indicate both the direction and strength of importance.

Rating Scale: 1=THE LEAST IMPORTANT---- 7=THE MOST IMPORTANT

Please type the rating number of your choice (from 1 to 7) in space within square brackets following each item below.

a) Creation of New Markets for Our Services and Products

[]

b) Better Prices for Our Services and Products

[]

c) Communication Efficiency through E-mails etc.

[]

d) Availability of Information Resources for Personal and Professional Use

[]

e) Opportunity to Publish and Be Heard

[]

f) Communicate with Family Members and Friends outside Sri Lanka

[]

g) Other (Please specify) []

[]

Question 16. Next, we ask you to answer an open question. During your membership of this ISP, what new things you were able to do that you did not do before you joined it. Please indicate two or more new things by typing within the brackets.

Please use as much space as needed.

[

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Question 17. Is there any service useful for your business, professional activities or education that you "wish" can be provided using the Internet and supported by your ISP?

Please type your answer below and use as much space as needed.

[

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Question 18. What, in your opinion, are the ways in which computing and communications can be used to support activities (such as business, various trades, agriculture, industry, including Web-based services) at the local level in Sri Lanka?

Please type your answer within the brackets and use as much space as needed.

[

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Question 19. What was the highest level of education you completed?

- 1) Passed GCE O/L
- 2) Passed GCE A/L
- 3) Completed a Professional Diploma
- 4) Completed a Bachelor's Degree
- 5) Completed a Master's Degree
- 6) Ph.D. or Doctorate Degree

Please type the number that represents your educational level in space (within square brackets) below.

[]

Question 20. Please select your age category

- 1) 18 or Younger
- 2) 18-25
- 3) 26-35
- 4) 36-45
- 5) 46-55
- 6) 56 or Older

Please type the number that represents your age category in space (within square brackets) below.

[]

Question 21. Please indicate your gender.

- 1) Female
- 2) Male

Please type the number that represents your gender.

[]

Question 22. With which one of the disciplines would you most closely identify yourself?

- 1) Accounting
- 2) Biological Sciences
- 3) Business
- 4) Engineering
- 5) Fine Arts
- 6) Humanities
- 7) Law
- 8) Mathematics
- 9) Medicine
- 10) Physical Sciences
- 11) Social Sciences
- 12) Other (Please specify) []

Please type the number that represents your major discipline in space (within square brackets) below.

[]

Question 23. Please indicate your profession.

- 1) Full-time Student
- 2) School Teacher
- 3) College or University Teacher
- 4) Business Man/Woman
- 5) Government Employee
- 6) Employee of a NGO
- 7) Private Company Employee
- 8) Member of Diplomatic Corps
- 9) Other (Please specify) []

Please type the number that represents your profession in space (within square brackets) below.

[]

Question 24. Please use the space below for any additional comments, suggestions or recommendations you may have concerning computing and the Internet in Sri Lanka.

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Thank You for very much your time and attention.

Please return this survey to survey@cag.lcs.mit.edu