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Pacific Asia Conference on Information Systems
(PACIS)

December 1995

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Recommended Citation

Palvia, Shailendra; Tung, Lai; Leng, Poh-Tuan; Ee, Soh; and Li, Wong-Pei, "A Study of Internet Awareness and Usage of the Two Singapore Universities" (1995). *PACIS 1995 Proceedings*. 47.

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A Study of Internet Awareness & Usage of the two Singapore Universities

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The IT2000 study envisioned that Singapore's National Information Infrastructure (NII) will connect existing and new computers in schools, offices and homes to enable people and organisations to tap into a variety of resources including the Internet resources worldwide. To tap into Internet's vast resources, they must first have an awareness of its potential and be trained in its use. We believe that many academics and students are still unaware of its potential as a vast source of information, knowledge (and hopefully wisdom). This study, first of its kind, examines the various issues pertaining to the access, usage and importance of Internet to both the academic staff and undergraduate student populations in Singapore. Results of this study indicated high level of awareness among both groups. However, usage was primarily limited to e-mail. The survey also indicated that the majority of the respondents felt that it was important for undergraduates to be Internet-literate.

1 INTRODUCTION

In Singapore, Internet may be accessed through Technet, SingNet and Teleview-SingNet [23], with SingNet and Teleview-SingNet being available to the public. Once there is access to Internet, a wide range of services becomes available to a subscriber. These services include:

- i) **Electronic mail** - the most widely used resource on Internet that allows users to send and receive messages from one another at a high speed and with low costs.
- ii) **File transfer** - the process of logging into a remote computer, retrieve files and transfer them between sites using a program known as the File Transfer Protocol (FTP).
- iii) **Remote Login** - Telnet - a program that allows the user to login to a remote computer and run programs on it as if the remote computer is just in front of the user.
- iv) **Discussion Groups** - services that use Internet as a platform to exchange news, information, ideas and views, and also to make contact with people sharing the same interests. Includes Usenet and Listserv.
- v) **Talk, Chat and Games** - the talk and chat facilities enable a user to exchange information in real time with other users who are on the Internet at the same time. Users can also play games such as chess, Go, and MUD (a program that provides text-based virtual reality for a user to take on a role and interact with other players with their own roles).
- vi) **Commercial Activities** - Internet may be used by businesses to disseminate information about their products and services. For example, the CommerceNet [12] [21] in USA enables individuals and firms to have access to product information, shop around for such products and services and pay for them using credit

cards or personal cheques. Users can also collaborate with one another on product development.

The many interface services available on Internet to retrieve the relevant information from the huge sea of information are:

- i) **Archie** - a client-server system that regularly and automatically indexes files on a large number of Internet services to create a single archive of documents. It helps a user to search files and directories which contain keywords that the user is interested in.
- ii) **Gopher** - a protocol developed at the University of Minnesota that offers a menu driven interface for users to navigate the Internet.
- iii) **Veronica** (Very Easy Rodent Oriented Net-wide Index to Computerised Archives) - a program that provides a keyword search of the menu titles from Gopher sites and after which it constructs a custom-designed menu from all the Gopher menus it can access with the titles gathered from the keyword search [14].
- iv) **WAIS** (Wide Area Information Service) - a client-server system that allows the users to search and retrieve full-text information from network resources by selecting one or more sources followed by specifying one or more keywords.
- v) **WWW**(World Wide Web) - a hypertext-based search tool which attempts to organise all data and information on the Internet into a set of hypertext documents.
- vi) **Mosaic** - a client program (browser) with a GUI and multimedia capabilities that enables a user to navigate the WWW by pointing and clicking a mouse.

2 RESULTS AND ANALYSIS OF SURVEY RESPONSES

2.1 Awareness and Usage

About 80% of the academic staff are users of Internet - an indication of Internet popularity among them. The majority of the academic staff users are from the sciences disciplines (engineering, science and computer science). About 78% of undergraduates are aware of Internet. Of those who are aware, about 50% use Internet. The usage pattern among undergraduates is significantly different from computer and non-computer disciplines. The majority of the undergraduate students were introduced to Internet through friends -- others mostly learning through the media and course offered. Among academics staff, the usage of WWW is the highest.

2.2 Level of Usage of the Services and Facilities

The usage patterns among academicians and students are quite similar except for the use of e-mail (very high for academics, not so high for students) and IRC (much higher for students). Tables 1 and 2 summarize mean frequency

usage among academicians and students. Furthermore, Tables 3 and 4 summarizes mean length of usage for both types of respondents. The rankings in terms of usage time appear to be significantly different for the two groups. IRC is indeed very unpopular with the academic staff.

Table 1 Mean Frequency of Usage of the Services and Facilities by Academic Staff

Services and Facilities	Mean Usage Per Week	Ranking
Electronic mail	4.6	1
Usenet Newsgroup	3.7	2
Telnet	3.5	3
FTP	2.2	4
Databases	2.0	5
IRC	1.0	6

*The mean frequency of usage is calculated by using 1, 2.5, 5 and 7 times per week to approximate "<twice/week", "2-3times/week", "4-6times/week" and "daily" respectively.

Table 2 Mean Frequency of Usage of the Services and Facilities by Students

Services and Facilities	Mean Usage Per Week	Ranking
Electronic mail	4.0	1
Telnet	3.7	2
Usenet Newsgroup	3.3	3
FTP	2.7	4
IRC	2.0	5
Databases	1.9	6

*The mean frequency of usage is calculated by using 1, 2.5, 5 and 7 times per week to approximate "<twice/week", "2-3times/week", "4-6times/week" and "daily" respectively.

Table 3 Mean Length of Usage of the Services and Facilities by Academic Staff

Services and Facilities	Mean Length per Usage in Mins.	Ranking
Telnet	33.4	1
Usenet Newsgroup	31.9	2
Databases	28.2	3
FTP	25.5	4
Electronic-mail	22.6	5
IRC	15.0	6

* The mean length of usage is calculated by using 15, 30, 45, 60 and 75 minutes to represent "15 minutes", "30 minutes", "45 minutes", "1 hour" and "> 1 hour".

Table 4 Mean Length of Usage of the Services and Facilities by Students

Services and Facilities	Mean Length per Usage in Min.	Ranking
Usenet Newsgroup	45.0	1
IRC	41.9	2
FTP	40.0	3
Telnet	39.2	4
Electronic mail	31.3	5
Databases	30.4	6

* The mean length of usage is calculated by using 15, 30, 45, 60 and 75 minutes to represent "15 minutes", "30 minutes", "45 minutes", "1 hour" and "> 1 hour".

2.3 Reasons for Using the facilities

Table 5 and 6 summarizes the reasons for using the Internet facilities given by the two respondent groups. While the most important reason for academics is for teaching and research purposes, for the students, the main reason is pasttime/hobby. The second most important reason for both the groups is essentially to keep in touch with overseas and Singapore friends.

Table 5 Reasons for Using the Facilities on Internet by Academic Staff

Reasons	No.	%
For teaching and research purposes	51	89.5
To keep in touch with overseas friends	37	64.9
For leisure and recreational purposes	16	28.1
For administrative purposes	14	24.6
To keep in touch with friends in Singapore	8	14.0
To keep up with technological developments*	1	1.8

*This reason is not in the list given and it is offered by a user.

Table 6 Reasons for Using the Facilities on Internet by Students

Reasons	No.	%
As a pastime / hobby	95	76.0
To keep in touch with overseas friends	59	47.2
To gather information for academic purposes	55	44.0
To keep in touch with friends in Singapore	39	31.2
To gather information on areas of interests	4	3.2
To keep up to date by Usenet Newsgroup	1	0.8
To get desired software and files	1	0.8

2.4 Importance of Internet

Mean level of Internet importance for the two groups appears to be significant different (see Table 7 and 8). The main reason that we can ascribe to this significant different is the direct linkage of Internet use and value-added to academics for their teaching and research.

Table 7 Importance of Internet to the Users

Importance	Scale (a)	No.(b)	%	(a) x (b)=(c)
Extremely Important	5	18	31.6	90
Important	4	28	49.1	112
Neutral	3	9	15.8	27
Not too important	2	2	3.5	4
Not Important at all	1	0	0.0	0
Total		57	100.0	233
Mean = 233 / 57 = 4.1				

Table 8 Importance of Internet to the Users

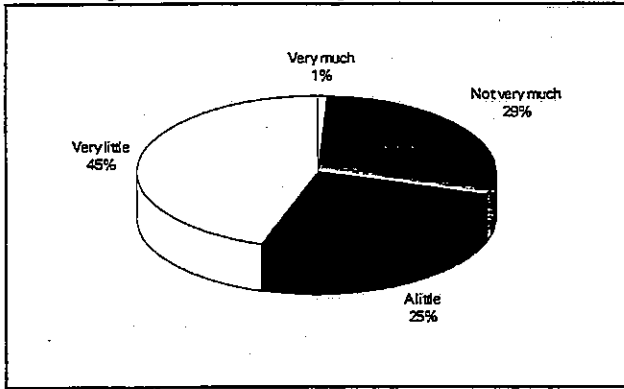
Importance	Scale (a)	No. (b)	%	(a) x (b)=(c)
Extremely Important	5	17	13.6	85
Important	4	35	28.0	140
Neutral	3	41	32.8	123
Not too important	2	17	13.6	34
Not Important at all	1	15	12.0	15
Total		125	100.0	397
Mean=397/125 = 3.2				

2.5 Status of Internet Non-Users

Non users in both groups are aware of the facilities. To non-user academics, the service that appeal to them the most are in the order of electronic mail, databases, FTP, and UseNet Newsgroups. Majority of them don't foresee the need for using Internet nor do they have the time. Reasons given by students non-users include "not knowing how to use Internet" and "not being interested" (see figure 1 for knowledge of Internet among non-user students).

Almost half of student non-users claim very little knowledge of Internet. Since the majority of the non-users know very little of Internet, much effort would be required to promote awareness and usage among them.

Figure 1
Knowledge of Internet Among Non-User Students



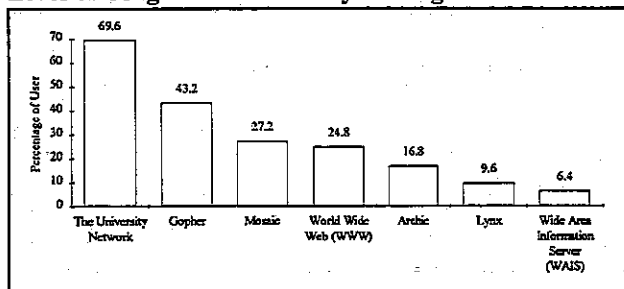
Since the most popular facility with the non-users is the electronic mail, followed by Usenet Newsgroup, these two facilities should be promoted among the non-users.

Three-quarters of undergraduates who were not aware of Internet have accessed the university network before. It would be much easier to promote Internet awareness and usage among them by educating them on how to use the various Internet services and facilities. Those not aware of Internet have some fuzzy notions including an international network, a computer facility to access and share information between schools, and a facility with access to many programmes and a bulletin board facility.

2.6 Level of Usage of the Interfaces for Accessing Internet

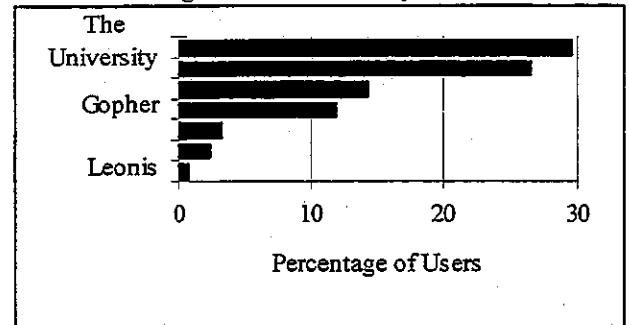
There are many interfaces for accessing Internet. Figure 2 below illustrates the usage level of the various interfaces for students.

Figure 2
Level of Usage of Interfaces by Undergraduates



The university network refers to the VAX system used by NTU undergraduates and the UNIX system used by NUS undergraduates. As can be seen from the above graph, it is the most commonly used interface. This is due to its accessibility to the undergraduates. Moreover, it can be used to access certain facilities such as the electronic mail directly and it also provides access to other interfaces such as Gopher and World Wide Web. Figure 3 below presents the interfaces students feel are the best.

Figure 3
Interface Thought to be the Best by students



The most number of users favour the university network which shows that it is indeed popular among undergraduates. Mosaic is a close second, with over a quarter of the users vouching for it. This is not surprising as Mosaic has a graphical user interface and is quite user-friendly. However, it is not readily available in NTU yet, hence the relatively low level of usage. Gopher, although ranked second in terms of usage, is not that. This is perhaps due to its text-based interface which does not support graphics.

3 CONCLUSIONS

There is a high level of awareness of Internet among the academic staff and undergraduates in both universities. Most academic staff use Internet, mainly for academic and research purposes. The usage level for undergraduates is lower. Among them, students in the computer disciplines have a relatively higher usage level, most probably due to their interest in computers.

On the whole, more than 80% of the academicians support the idea of undergraduates learning Internet. As for the students, a higher percentage of non-users think that undergraduates should learn Internet than users do. However, there was no strong support for compulsory Internet courses.

Finally, it is predicted that with Internet's vast information resources and services, and its world-wide links to million of users, it will most likely become the global information superhighway of the future. By exploiting Internet's potential fully to tap the knowledge and information resources available, Singapore will move closer to attaining its IT2000 goals of developing a National Information Infrastructure (NII) and becoming an intelligent island.

(References available upon request)