SCIENCE

'Electronic mail' links up Sri Lankan scientists

Scientists in Sri Lanka, as well as in many other developing countries, have been constrained in their research work by the limitations of resources and physical distance from their peers elsewhere in the world. Scientific books and journals are too expensive, and even when are affordable, it takes weeks or even months to arrive. At the rate science and technology progress today these limitations tend to leave Third World scientists lagging behind. International phone calls and fax are too expensive even when it is available — which is often not the case.

Electronic mail, low-cost system of communicating using personal computers and ordinary telephone lines, could offer a viable solution to this situation. e-mail, as this system is called, has been in use for over a decade. In Sri Lanka, it has had limited applications from the mid 1980s. In this article, science writing intern Ray Jayawardhana brings an update on how Sri Lanka is gearing upto using e-mail for academic, research and other purposes.

With the recent introduction of electronic mail, Sri Lanka has come another step closer to being a full-fledged member of the Global village. At the moment, users at six universities and research institutes, as well as several non-governmental organisations (NGOs) and private institutions can contact each other, and their colleagues abroad, through this computer-based communication service.

Electronic mail, or e-mail is a way of transmitting messages from one computer to another through a telephone line. E-mail could often be faster more versatile and even cheaper than the conventional (postal) mail or a telephone call. In a world where information has become one of the most important commodities, e-mail and other kinds of computer-based communication have become tremendously popular. Both the academia and industry have turned to e-mail for most of their daily work.

Dr. Gihan Dias

An e-mail message is usually sent from one person to one or more recipients using a mailer program installed in the computer. When invoked, the mailer will request the e-mail address of the recipient (s), subject of the message, etc., from the user. Next, it will ask the user to type in the body of the message.

Once completed, it will send the e-mail message to the "mailbox" of the intended recipient. When the other party invokes the mailer on his or her computer, it will show a list of messages that have been received. The user can then select and read messages.

An early effort to introduce electronic mail in Sri Lanka was the Mallard mailbox system installed at the Arthur C. Clarke Centre for Modern Technologies in Katubedda several years ago. The mailbox was connected to a telephone line, and could call other such units and exchange messages. A few individuals and organisations in Sri Lanka use "accounts" in various foreign e-mail services, but the high cost of making an IDD telephone call to access the service had hitherto held back many potential users.

The advent of a local e-mail system had to wait for a pioneer of its own. If not for the enthusiasm and energy of Dr. Gihan Dias, presently a senior lecturer at the University of Moratuwa a regular e-mail connection for Sri Lankan universities would still be a pipedream.

An electronics engineering graduate from Moratuwa, Dr. Dias was no stranger to e-mail. As a graduate student at the University of California at Davis, from where he obtained a Ph.D in computer engineering recently, he was instrumental in setting up SLnet, an electronic mailing list that serves Sri Lankans abroad. Currently SLnet obtains Reuter, Xinhua and other news items on developments in Sri Lanka, and sends it to its members *via* electronic mail. In addition, a membership list is also published, allowing Sri Lankans abroad to communicate with one another.

Started in early 1989 with around 20 US members, Dr. Dias' brainchild has now grown to serve over 1000 members in at least 10 countries. Last year, Dr. Dias was elected founder President of the Lanka Academic Network (LA Net), which now provides funding for SL net's operation.

As early as 1989, a proposal was submitted to the Sri Lankan government on establishing a computer network, LEARN [Lanka Experimental Academic and Research Network] linking research institutes and universities to one another and to international academic networks. In preparation for this, a small group based at the Moratuwa University tried to set up links with the Colombo University and a few other sites. "When I came home for a holiday in 1990, I brought a modern and we did some tests with e-mail link," Dr. Dias recalls. The pioneering team, which included Dr. Abhaya Induruwa, head of the computer science and engineering department at Moratuwa, and Mr. Clement Adams, was convinced that a dial-up e-mail connection was very cheap, and could provide a basic service quickly.

A regular e-mail service commenced in May 1991 with the University of Moratuwa as its central hub. The Moratuwa computer (called "1kmor") is connected to a modern and awaits incoming calls 24 hours a day. Other sites, such as University of Colombo, the Open University and Environmental Foundation, call this computer twice a day or so and transfer incoming and outgoing messages.

According to Dr. Dias, most messages reach their targeted destination within 24 hours. The Moratuwa e-mail hub also has connections to international networks through two computers, one located at Stanford University, California, and the other in Amsterdam, Netherlands. Therefore, users of "ac.lk", as the Moratuwa hub is known, have access to all major e-mail networks world-wide.

In November 1991 alone, the international link carried some 644 messages. Dr. Dias expects the traffic to increase by at least ten-fold this year as more local sites are connected to the network, and more people become familiar with the new technology. One frequent user is the Colombo arm of the Environmental Legal Action Worldwide (ELAW) group, which is based at the Environmental Foundation, a local NGO.

Sri Lankan researchers are also increasingly using e-mail to keep in touch with their colleagues abroad. For example, Dr. Induruwa of the University of Moratuwa regularly contacts colleagues at the University of Keele, UK, with which Moratuwa has a scholar exchange programme.

E-mail is also helping to strengthen links between the Institute of Computer Technology [ICT] attached to the Colombo campus, and the University College of Cardiff, UK. A Sri Lankan student visiting home for a holiday from the US has used e-mail to receive his tutorials and to return his assignments to his professor. This is a sign of things to come.

Within the coming year or so, Dr. Dias expects the LEARN network to be operational. Then the local e-mail users will be connected on line to the major US academic netwrok Internet, which now has over a million hosts in some 34 countries.

Through Internet, LEARN users would also be able to connect to other academic networks such as Bitnet (USA), Janet (UK), Arnet (Australia) and Ernet (India).

The advantages of speed, cost, easy integration with other applications and not requiring an immediate response have made e-mail extremely popular worldwide within a short period of time. For example, most places within the US are only a few minutes away *via* e-mail. E-mail is much cheaper than fax: a message from Sri Lanka to the US by e-mail is only 1/5th the cost of sending it by fax. Also, e-mail takes off the workload (and cost) involved in printing out letters, putting them in envelopes, and mailing them. One great advantage e-mail has over the telephone is that you don't have to be physically present at your terminal to receive an incoming message: the message will be stored until you read it.

If Dr. Dias' dream turns into reality, Sri Lankans too will soon share these benefits of information technology. With a small financial investment and a lot of hard work, we already have an experimental academic e-mail network designed, implemented and operated by Sri Lankans for Sri Lankans. Extending it to an international on-line link now seems just a matter of time and sufficient interest.

Sri Lankan University researchers, scientists attached to research institutes and NGO workers will all find many uses of e-mail in the years to come. It is hoped that, with the help of e-mail, scientists in Sri Lanka will — at long last — be able to overcome the intellectual and academic isolation which has for so long hindered their progress and integration into the world of science.

Indian space programme forging ahead

As India celebrated the 45th anniversary of independence last week, the Indian space programme was highlighted as a noteworthy achievement of the nation in the post-colonial era. The Indian space programme, which is one of the most ambitious for any developing country, has had its ups and downs.

Initially dependent on Soviet and American technology for launches and manufacture of satellites, India has relentlessly pursued the goal of self-reliance in its space industry. This has brought India the capability to produce and launch its own satellites. In the 1990s, the probramme aims to consolidate achievements and to expand its

the star spenders on space. And the costs are still growing. While Aryabhata, Bhaskara and APPLE cost about Rs. 10 crore to Rs. 20 crore, the latest remote sensing satellites cost around Rs. 100 crore, and the indigenous communications satellites about Rs. 200

tion of Peaceful Uses of Outer Space in 1991:

"There is one area in which the country has not been able to make a significant headway. This relates to the manufacture of electronic components and devices needed for use in space.

whether a developing country like India could afford to go in for space technology, but whether it could afford not to."

The 1960s were a competence-building phase. However, the programme also envisaged becoming selfreliant in satellite and

tered to long distance communications, meteorological observations and nationwide direct satellite TV and radio broadcasting. It also enabled communications to remote areas and cyclone prediction.

Farming by satellite

You'd think that spreading fertilizer using a satellite would waste a fair amount of fertilizer. But no, quite the oppo-

quality.

The research farm will stop applying nitrogenous mineral fertilizer altogether in some

and soil microbacteria under the different farming regimes.

They may even be able to look at the total effi-