Computers For Research And Development In Pakistan

—Azim Kidwai

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PAKISTAN, though a developing country, has taken strides to meet the challenge of the computer era. The effort in computer science and digital technology is, of course, not comparable to that in the Western world, or in Japan, but is commensurate with the present-day needs of the country. Institutions of higher learning in computer science and technology have, of late, started functioning and research and development groups have done some notable work in digital communications, in software, and design and development of many computer-controlled gadgets are on the anvil.

The progress in this sector of high technology should go a long way in making a smooth transition into the 21st century in which digital technology and computers are going to have a sway on human affairs.

At present there are about a hundred large computers in operation in Pakistan and as many minicomputers to run smaller establishments. But what has really brought computer into the mainstream of life in Pakistan, is its micro-version. Data processing machines, digital telephone exchanges in offices, word processors in publishing houses. Micro-computers in schools, in homes, in shops, video-games, and electronic desk calculators, have given a feel of the computer to a good cross section of the public.

Such systems are galore, and in the aggregate, they number no less than a quarter million in the country.

Training and teaching at higher levels in computer science and technology has, therefore, turned imperative, so as to install, to run, to feed, and to maintain these systems.

While some of the universities in the country have started giving degrees at the B. Sc. and M. S. levels in computer science and technology, mono-discipline institutes in the subject are also coming up in the field.

The Quaid-e-Azam University in Islamabad, the premier university of the country, has organised courses leading to M. S. degree in computer science.

The NED Engineering University in Karachi is awarding B. Sc. (Engineering) degree in computer technology.

These are government-financed institutions. But no less significant are the efforts of the private sector to vitalize education and training in the field of computers.

Institute of Computer Science: An Institute of Computer Science (ICS) started functioning in Karachi about a year back, wholly supported by private sector. It awards a degree in computer science and is affiliated to the University of Karachi.

The Institute has been established by the BCCI (Bank of Credit and Commerce International) Foundation for the Advancement of Science and Technology, a philanthropic venture of the private sector.

The ICS offers 3-year courses leading to BCS, (Bachelor of Computer Science). It is a model institution and calls for some detailed description to appreciate the quantum and level of education now available in computer science in Pakistan.

To ensure excellence in academic standards, the ICS admits only 40 students every year. With a qualified staff of 12, many of them M. S. and Ph. Ds from foreign universities, the teacher-to-student ratio is its hallmark, not seen most of the universities in Pakistan.

There is considerable emphasis on practicals and experimentation at the ICS. An in-house IBM—4331 computer is the hardcore around which the students learn the intricacies of computer science. Eleven individual terminals, with personal computers have been provided, so that each student can work on the computer system independently without sharing his experiments with other students.

The Institute has fully equipped micro-processor and digital electronic laboratories to support the BSC degree programme.

A software library includes several high level language compilers and numerous utility and application packages for both the main frame and personal computers.

The courses offered are designed to impart comprehensive

knowledge in most of the subjects necessary for a broad base understanding in computer science. For instance, digital computer logic, advanced computer programming, software engineering, and computer graphics make the students conversant with what they will be required to perform when they enter the field as professionals. With an eye on future, they are introduced to artificial intelligence and about how it is being developed in the fifth generation computers.

Pakistan has not progressed well in software consultancy. To fill the gap, the Institute has established a Software Consultancy wing that should lead to high level software groups doing work that could be exported.

Since software development does not require great amount of capital, the developing countries with good brains can meet some of the software needs of the developed countries where such expertise is much more expensive.

Though the pace is slow, R&D (Research and Development) companies based on indigenous expertise are in operation in Pakistan for the last 5 or 6 years, doing excellent work in such fields as digital communications based on software and allied equipment.

For instance, a group working in high technology communication systems has designed and developed a digital telephone exchange package with a capacity of 30x250 lines. The government-sponsored Telephone and Telegraph Department is to

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manufacture the system in its factory (Telephone Industries of Pakistan) at Haripur, Hazara, in the north.

A branch exchange that has a capacity upto 300x2000 lines, is also on the anvil.

COMPUTERIZED BILLING

Computerized detailed billing equipment for large telephone exchanges, based on digital technology, is getting final shape.

Also design and development work by the same group has led to a small exchange unit suitable for offices. This 5x25 line system is also being manufactured.

A telex exchange is also on the cards. A low speed telex switch, which is interfaced to a computer and to public telex