

Application Report

KAIST Demonstrates Improved Productivity With Computer Technology

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Advanced computer technology is being rapidly introduced in the Republic of Korea through the efforts of a research institute and its Control Data CYBER 174 system.

The computer operation of the Software Development Center(SDC) of the Korea Advanced institute of Science and Technology(KAIST) serves the institute's academic and research activities and also is the focal point for the country's growth in computer technology.

With capabilities in computer-based education, computer-aided design, satellite processing, data base management and timesharing, KAIST's SDC has one of the leading computer facilities in Southeast Asia. A primary objective of the center is to demonstrate how computer technology can improve the productivity of business, industry, education and government. It provides software development services and support staff for all types of organizations and activities and engages in research on software and information systems.

The fastest growing application is computer-based education using the PLATO system, installed on the CYBER 174 in 1980 and now serving 18 terminals.

Five public schools in Seoul are now using the system and more will have the service when additional terminals are installed shortly. Korean Airlines is preparing to use

PLATO for pilot and maintenance crew training. KAIST believes other organizations with training needs will turn to PLATO as it becomes better known in Korea.

“PLATO is capable of easing one of the greatest strains on our education program - the shortage of teachers.” explained Dr. Ki Soo Sung, director of the SDC.”

“With a teacher-student ratio of 70 to 1, Korea can neither afford nor provide the quality of education required as the country expands its industrial base and business activity. PLATO offers an exceptionally effective way to ease that problem and improve education opportunities.” he said.

Dr. Sung noted that Korea presently has 10million students, and an annual birth rate of around 1million. “Koreans put a high value on education,” he said, “so we are faced with growing needs for many years to come. Since we are a relatively small country, communications will not be difficult nor expensive as we expand computer-based education.”

To promote the use of PLATO, KAIST developed a team of analysts and courseware experts to assist schools and businesses. The first major project was to develop a means for converting the PLATO software to the Korean language. With that accomplished, the team began the ongoing task of converting lessons appropriate to the schools’ needs and training teachers to develop courseware.

In addition to computer-based education, KAIST uses the CYBER174 for satellite processing to study Korean terrain and surrounding ocean areas for government agencies and commercial clients. Using Landsat data and KIPS, an image data processing package developed in-house, KAIST is the major source in Korea for map making and monitoring pollution and agriculture activities.

As Korea's building industry grows at the annual rate of 25 percent . KAIST's computer services are much in demand for cost estimates, design and engineering and structural analysis. In most cases KAIST provides tailor-made software, but it also has an

extensive program library that includes universal packages such as SAP 4, NASTRAN, ADLPIPE and others.

Computer Matches Students to Schools, Saves \$10 Million

For government agencies, KAIST is the sole domestic source for software computer development and consultation. One particular province, Choong-Book, which represents one-tenth of the country's land area, has been selected as the proving ground for use of computers in government operations. Databases on land ownership and automobile registration have been developed. Terminals and printers equipped with Hangul, the Korean alphabet, operate in every county office with data links to a minicomputer in the provincial office, which is supported by the CYBER 174 at KAIST.

One project undertaken by KAIST provides strong evidence of the productivity of computer application—it saved the client \$10 million over a two-year period.

The project involved determining the residence address and nearest school for each of Seoul's 1 million public school students to make more convenient school assignments. Previously, students were assigned at random with no consideration for school location and residence address. After the huge data gathering task was completed, the CYBER174, using the APEX linear programming package, provided the nearest school location for each student.

School officials estimated a saving at \$10 million in the first two years of the program due to reduced transportation requirements. In addition, there was a noticeable reduction in pollution and traffic congestion during the rush hours when students were going to school.

Another major computer application provided by KAIST involves the poultry industry, one of Korea's largest agricultural segments. The client, who raises 3 million chickens simultaneously, is equipped with a minicomputer linked to the CYBER 174

computer. Software programs developed by KAIST tell the poultry farmer what feed mixtures to use and when to change them, and keeps records on food consumption, the genetic combination of the flock, weight gains and other data.

KAIST began using Control Data computers in 1969 when a CDC3300 was installed, then the largest computer in Korea. By 1971, KAIST had developed a native language printer and installed the country's first optical scanner, a CDC 936, to handle a telephone billing system. These two events accelerated the introduction of computer technology into Korea, said Dr. Sung. Shortly thereafter, KAIST began developing management information systems for industry and government clients. In 1972, a Control Data CYBER 72 was installed to support the country's first timesharing service and data communications network.

Computer operations at KAIST's SDC are managed by Chung Il Pak and include a staff of 90—operators, card punch personnel, systems engineers, communications specialists and a maintenance team. Another 180 persons are full-time programmers and analysts and another 30 make up a support group.

Special project teams drawn from the programmer group are devoted to major computer application areas of clients. These include image processing, basic software, CAD/CAM, CBE, construction, engineering, hospital applications, management information systems, and application development for the Supreme Court and the Board of Audit and Inspection.

As the only timesharing data service in Korea, the computer center operates around-the-clock, seven days a week with a processing load of about 30,000 jobs a month. About 20 percent of the computer time is used by KAIST students and faculty.

Pak said the major features of the computer operation is its availability to users of all size and need, a high level of support for users, timesharing, data communications with a broad range of protocols and reliable computing equipment.