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Dear DECsystem-10/20 customer:

Many of you have chosen to increase your computing capabilities with VAX systems over the past two years.

As part of Digital's ongoing commitment to large systems users, we offer products, programs, and services to assist you in your migration effort, as well as maintain your current system. These include: An Integration Tools Clearinghouse (published in each issue of Large Systems News); a KL10-to-VAX 8600 trade-in program; and comprehensive 36-bit support services through our Customer Support Center in Colorado Springs.

To handle the type and scope of jobs that require the power of a DECsystem-10 or 20, we believe we have the best solution in the industry: the VAXcluster System. Currently, there are more than 3,500 VAXcluster System sites worldwide.

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Enclosed you will find a special edition of Digital's Inter-Office Magazine devoted solely to VAXcluster System customers, many of whom have large, complex, and demanding jobs.

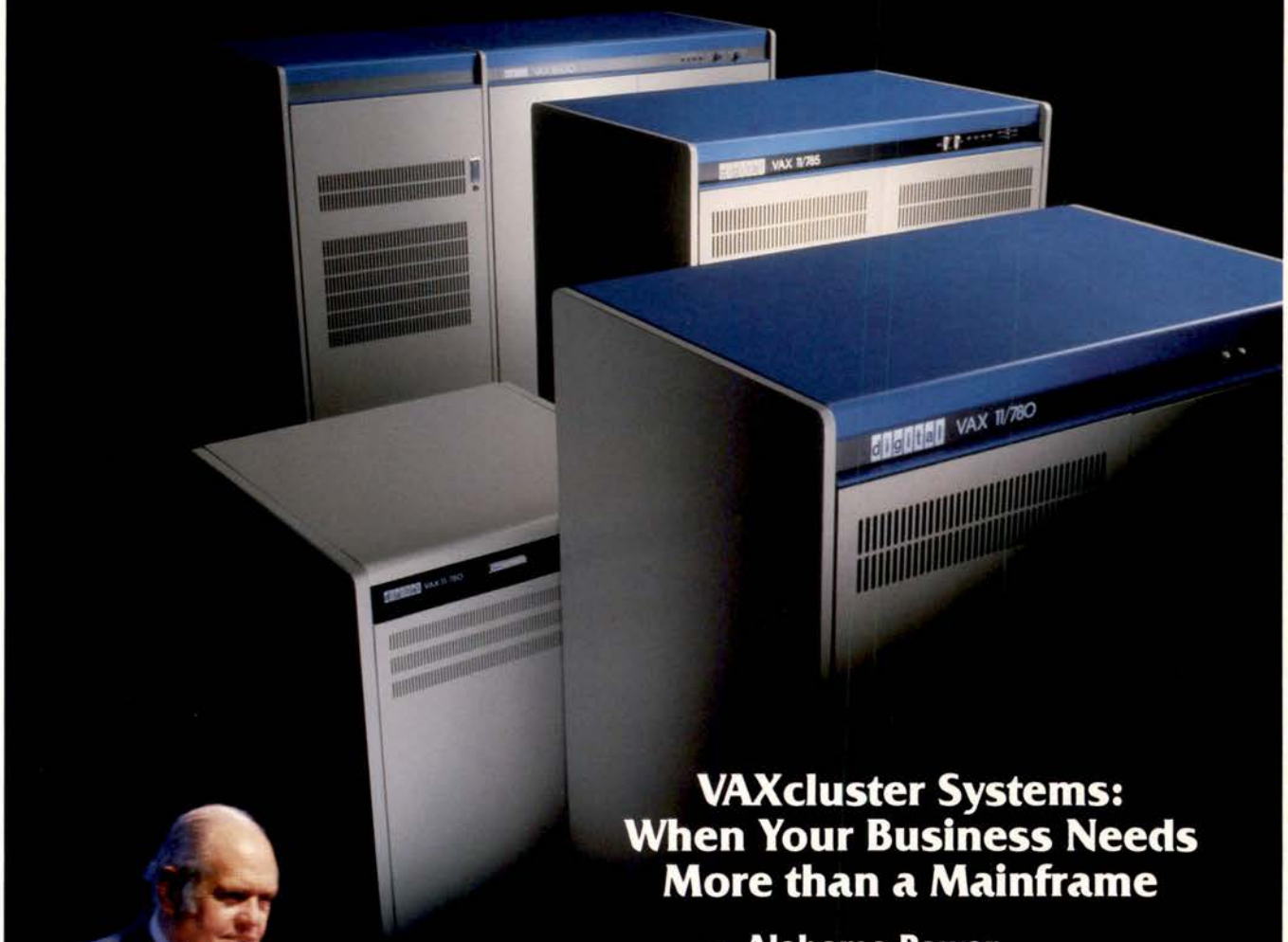
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Rose Ann Giordano
Vice President, Large Systems Marketing

Rich Whitman
Product Line Manager
Large Computer Group

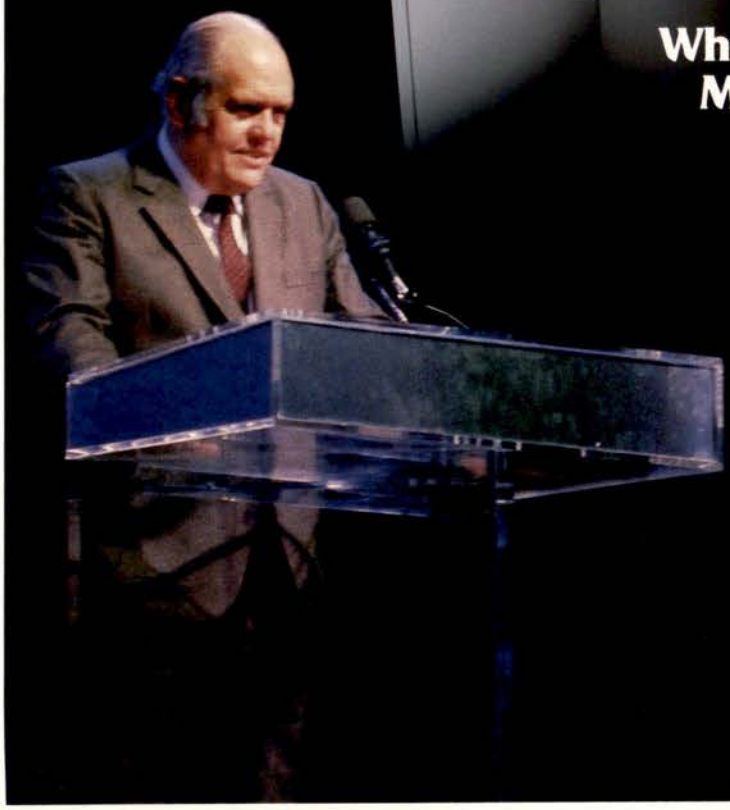
InterOffice

Digital Equipment Corporation's International Solutions Magazine — VAXcluster Systems Edition



VAXcluster Systems: When Your Business Needs More than a Mainframe

- Alabama Power
- Corroon & Black
- Erasmus University
- GA Technologies
- G.J. Coles and Coy Ltd.
- GMF Robotics
- Lederle Laboratories
- McDonnell Douglas Corporation
- MCI Communications
- New South Wales Department of Health



On the cover

Ken Olsen, president of Digital Equipment Corporation, delivered the keynote speech at DECWorld-85, one of the most extensive demonstrations of computing solutions ever assembled by a major computer manufacturer exclusively for business professionals. Held last year in Boston, Massachusetts, the show featured a powerful and fully integrated computing environment capable of simultaneously serving thousands of users.

The show's centerpiece was a cluster of seven VAX computers (four VAX 8600s, two VAX-11/785s and a VAX-11/750), with a full complement of 96 disk drives, providing 46 billion bytes of shared data and programs. With the power of a mainframe computer, along with incremental growth, ease-of-use, shared data, and high system availability, VAXcluster Systems can meet all your customers' needs.

And at DECworld-86—February 24-28:

- $18 million in Digital Equipment Corporation's products
- A 1 1/2-acre exhibit area
- Full implementation of DECnet/Ethernet networking
- More than 60 seminars
- In Boston, Massachusetts

FOCUS *an Editorial*

VAXcluster Systems: when your business needs more than a mainframe.



Bob Glorioso is vice president, High Performance Systems and Clusters Group, Digital Equipment Corporation.

The articles in this special edition share a common focus: the VAXcluster System, a revolutionary concept in large computer systems from Digital Equipment Corporation. A VAXcluster System is a large multiprocessor computer system with abundant and expandable data storage capacity.

For years, large system computing was locked into one concept: a single central processing unit (CPU) with a single data storage subsystem. With VAXcluster Systems, however, Digital has broken the link between the single CPU and the single database. A VAXcluster System combines multiple independent CPUs with multiple storage subsystems, allowing many active users and applications to share the same stored data.

Benefits

VAXcluster Systems bring a host of benefits to people who depend on computers, from executives and managers to secretaries and system programmers. One advantage is value. For most applications, a VAXcluster System can provide equivalent computing capacity and comparable data storage for one-half the initial cost and one-half the total five-year cost of a traditional mainframe computer.

The ability to expand a VAXcluster System is equally dramatic. A cluster can easily grow tenfold with no change in operating systems, no wholesale equipment replacement, no conversion of application software. A VAXcluster System can be configured to provide the processing power in excess of 70 MIPS (millions of instructions per second). To the user, such a system appears as a single computing entity capable of providing hundreds of gigabytes of online storage.

VAXcluster Systems assure high availability through hardware and software redundancy. A VAXcluster System can be configured so that there is no single point of failure. If one component of the system goes down, the others reconfigure around the failure, ensuring integrity and availability.

With ALL-IN-1, Digital's office and information system, VAXcluster Systems offer unparalleled information management and decision support capabilities in the office environment.

Other benefits accrue, too. Digital's VAX-series computers use one operating system, VMS (virtual memory system), which many computer professionals regard as the industry standard. Furthermore, VMS meets some of the most stringent security requirements.

And combined with Digital's leadership networking products, VAXcluster Systems offer a superior capability in transferring data and information to other systems that competing products cannot approach.

In this edition

There are presently more than 3,000 VAXcluster System installations around the world. The 10 application stories in this collection represent the range and breadth of those installations.

For example, at GA Technologies in Southern California, VAXcluster Systems handle vast amounts of data generated by nuclear fusion experiments.

Computer-aided design, engineering, and manufacturing require large amounts storage, high computing speed, and sophisticated communication capabilities. Relying on the flexibility and power of VAXcluster Systems, McDonnell Douglas in St. Louis, Missouri, and GMF Robotics, Troy, Michigan, have combined those disciplines into computer-integrated manufacturing (CIM).

In Australia, a continent-wide retail distribution system gathers information during a few critical late-night hours. The operation at G.J. Coles is time-critical, and VAXcluster System availability helps them meet tight schedules.

Corroon & Black, a large brokerage group with headquarters in Nashville, Tennessee, demands computer and data availability. With its VAXcluster System, the firm has availability and redundancy that a traditional mainframe could not hope to equal.

Networking, around the block or around the world, is critical to the communications business of MCI Communications. For reliability in their own communications, they've chosen a VAXcluster System.

The substance of these and the remaining stories in this collection demonstrates the capabilities of the VAXcluster System—comprehensive and flexible, capable of meeting a universe of needs, now, and tomorrow. ■

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Erasmus University

Located in Rotterdam, The Netherlands, this university has chosen to replace its DECSYSTEM-2060 with a VAXcluster System, including a VAX 8600. VAXcluster Systems provide the flexibility and easy growth required in an academic environment. . . . . **Page 11**

GA Technologies

A nuclear technology company uses VAX systems and DECsystem-10s to process reports and the enormous quantities of data generated by physics experiments to harness nuclear fusion. The VAXcluster System supports data manipulation and sharing among many users on the fusion network. . . . . **Page 12**

G. J. Coles and Coy Ltd.

Australia's largest retailer, an employer of more than 82,000 people, has built a computer network around VAXcluster Systems. VAXcluster Systems at five regional distribution centers control inventory, stocking, purchase orders, distribution, and shipping. Another at company headquarters is used for administrative and software development work. VAXcluster redundancy provides the high system availability needed to handle time-critical order processing. . . . . **Page 18**

GMF Robotics

This leader in robotics in the United States uses two VAXcluster Systems to help automate administrative as well as computer-aided design and manufacturing systems. The VAXcluster System has allowed harmonious growth of GMF's computing capacity. . . . . **Page 22**

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A leading pharmaceutical firm is migrating its major research databases to a VAXcluster System from three DECsystem-10s. Lederle also is establishing a heterogeneous worldwide network of workstations for its scientists. . . . . **Page 25**

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A major Australian health care provider recently ordered its 37th VAX system. Its VAXcluster System forms the core of a central computing facility in Sydney, at a much lower cost of ownership than a traditional mainframe. . . . . **Page 32**

InterOffice

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Pilot project tracks time and savings

Alabama Power responds to stockholders, public with fully integrated system

By David Locke
InterOffice Staff Writer



Walter R. (Roy) Barron, manager of telecommunications and chairman of the pilot project steering committee, explains Alabama Power's commitment to its ratepayers and stockholders.

At its corporate headquarters in Birmingham, Alabama Power Company is planning and testing office information technology with the same blend of caution and vision that characterized the founders' commitment to hydroelectric power in the first decades of this century.

A six-month long pilot project now under way will track time and dollar savings with the precision of an auditor's fine-tip pen. At the same time, executives and managers have begun to plan for the broad changes in corporate organization, distribution of authority, and job definitions which the revolution in information management will bring.

"We are looking to document and audit hard dollar savings," said Walter R. (Roy) Barron, "because we are responsible through public agencies to our ratepayers as well as to our stockholders." Barron is manager of telecommunications and chairs the office automation pilot project steering committee.



Staff interest in improving effectiveness led Alabama Power's management to investigate office automation, according to Elmer Harris, executive vice president.

About 120 people are participating in the pilot program. The project includes VT200 series terminals, DECmate word processors, and Rainbow personal computers with access to an ALL-IN-1 office menu layered on a clustered pair of VAX-11/785 computers.

A new 18-story corporate headquarters under construction will finally bring under one roof departments scattered throughout greater Birmingham. The pilot project will help define user and system needs for a fully integrated telecommunications, data processing, and office information system for the new headquarters.

Alabama Power is one of four operating companies within The Southern Company, which is one of the largest investor-owned electric utility holding companies in the United States. The parent group provides electric power to more than nine million people in Alabama, Georgia, southeastern Mississippi, and the Florida panhandle.

Expansion

Demand for electric power exploded in the years following World War II and sparked a parallel growth at Alabama Power. The system grew with the addition of new steam plants, new dams and generators, new divisions, districts, and crew headquarters.

Demand for office space grew along with everything else, stretching the limits of the general office building which had been constructed in 1925 and expanded in 1950 and 1958.

"Planning for a new corporate headquarters started in the 1970s," said James C. Poole Jr., assistant manager of support services. Uncertainties introduced by the energy crisis and the oil embargo delayed those plans, Poole said, but by late 1980 they were moving again.

System design for the new headquarters shows the same blend of venturous conservatism that has characterized other corporate commitments at Alabama Power. In general, Poole said, building design was guided by a rule of flexibility, by the need to plan for change.



James C. Poole, assistant manager of support services and steering committee member, discovered the time savings Digital's equipment provides.

Alabama Power generates energy from multiple resources

An unusual generation mix including a large share of hydroelectric power distinguishes Alabama Power from many other utilities across the nation. In 1983, fossil fuels accounted for almost 63 percent of Alabama Power's generating capacity, nuclear power for almost 20 percent, and hydroelectric for just over 17 percent.

The commitment to hydro power is rooted deeply in the company's origins. In the early 1900s, electricity remained little more than a dangerous curiosity for many people. To William Patrick Lay, the company's founder and a former steamboat captain, water-driven turbine generators were a means to lift Alabama into the Industrial Age.

In a series of moves which combined hardheaded financing and visionary planning, Lay and his partners found British backers to fund the beginnings of a master plan to develop the Coosa and Alabama Rivers. The two rivers and their tributaries form a basin which drains about one-third of the state's total land area.

From 1912 through the 1920s and again in the 1960s, hydroelectric construction projects throughout the state made real the steamboat captain's dream. Today that hydro power, along with coal-fired plants using largely Alabama-mined coal, helps to keep Alabama Power's rates among the lowest in the United States.

In 1977, the first of two nuclear generating units at Farley Nuclear Plant in the southeastern part of the state came on line. Today, Plant Farley provides 30 percent of Alabama Power's generation. The second unit began operation in 1981, Alabama Power's 75th anniversary year. ■

For example, a unit called "the green box" will use off-peak energy during the night to make ice, which will lessen energy needed for daytime cooling.

"Within conservative guidelines we've incorporated leading edge technology," Poole said. "It helps us use our generating capacity to its maximum."

The pilot office

As building plans matured, interest in computers intensified among support staff. Word processing and spreadsheet analysis were among the tools people wanted to improve work efficiency. Their requests eventually reached the desk of Elmer Harris, executive vice president.

"I was convinced that standalone systems were not the way to go in the long run," Harris said. "But the staff interest in improving effectiveness was so strong we decided to explore the whole area of office information systems."

Harris and Randy Hardigree, vice president for corporate planning, decided it was time for the company to install a pilot office information system to obtain data to help guide the effective infusion of this technology into the company's operations. A steering committee was appointed and asked to install a pilot system for about 25 people, most of them secretarial and support staff at the executive levels in the corporation.

The pilot project will help define user and system needs for a fully integrated system for the new headquarters.

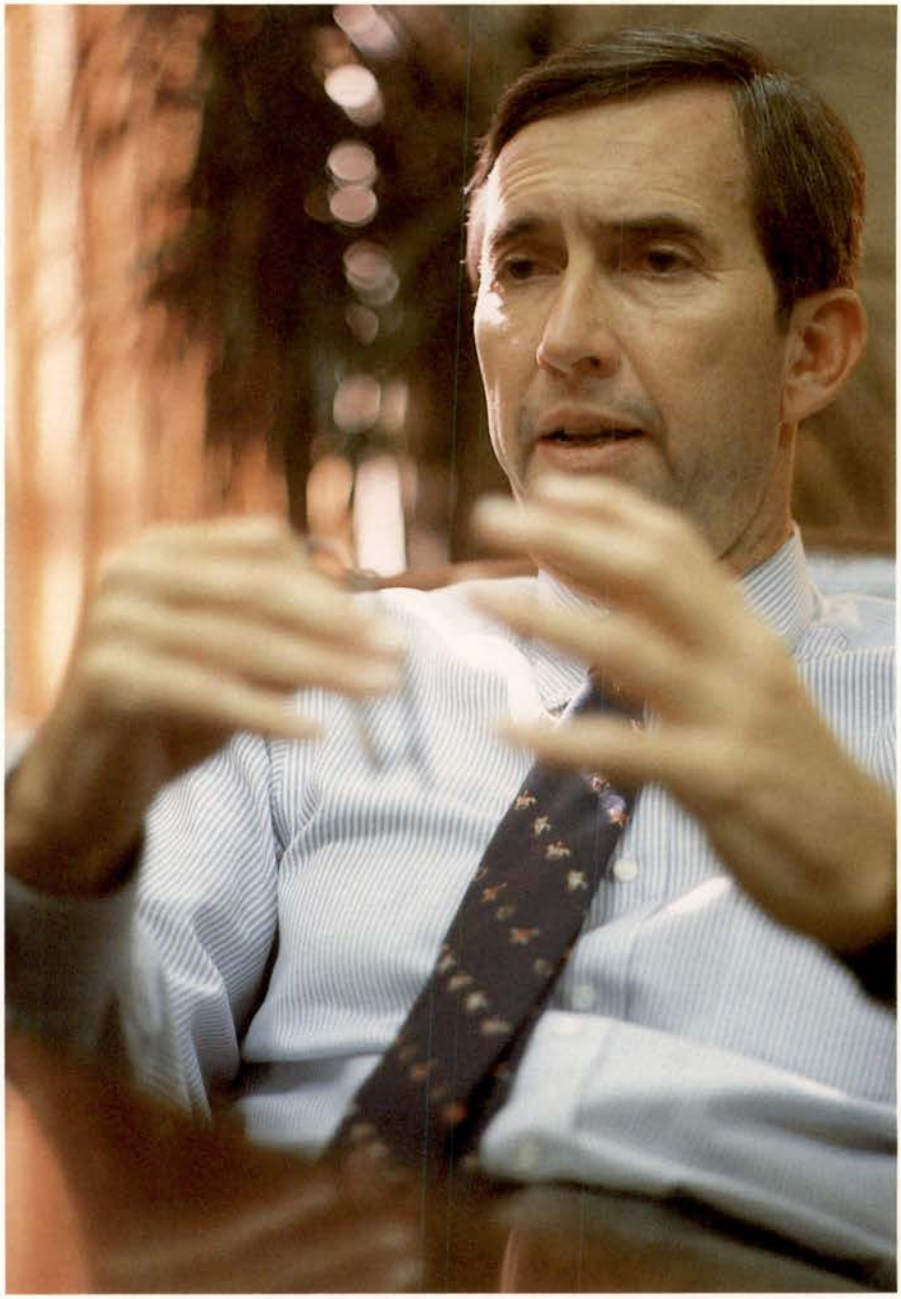
During the summer of 1983, the committee sorted through the offerings of six computer vendors. Just before Barron and Mark Carter, MIS support manager, were scheduled to visit DECtown in Boston that September, the committee tentatively decided to go with another vendor.

The committee agreed they would stay with that vendor unless the Digital exhibit provided "overwhelming and convincing evidence" to go another route.

And they did find evidence. "It was simple," Carter said. "We were looking for integrated capabilities. Digital showed they could deliver what we needed."



"Digital showed they could deliver what we needed," said Mark L. Carter, manager of MIS support and steering committee member.



Randy S. Hardigree, vice president, corporate planning, is looking forward to linking databases to form a pool which will meet all of Alabama Power's needs.

The evidence proved to be as convincing for the rest of the steering committee. According to Randy Hardigree, "We had specified our needs fairly carefully. Of all the vendors, Digital met our requirements most closely."

Paper, information measurement

Even as the initial pilot was being installed, the steering committee was concerned about size and representation. They shared their concerns with Michael Blalock, Digital's sales representative. Blalock and his managers arranged for Robert McDowell, an office specialist with the Arthur Young consulting group, to visit with senior management at Alabama Power.

"The meetings were challenging and productive," McDowell said. "I met with all the project participants. With Joe Farley, Alabama Power president, and his senior staff, we had a chance to explore some of the wider implications of the project they were undertaking."

In the spring of 1984, Alabama Power engaged McDowell to help enlarge the pilot project, design measures to document use and savings, establish specific program objectives, and assist in extending the office technologies throughout the new headquarters building.

"Alabama Power is a rewarding company to work with," McDowell said. "There is a very positive attitude toward the project, throughout the company, at all levels. That attitude makes the whole process more productive."

The current pilot program now includes 120 people who represent a selected sample of the estimated user population in the company as a whole. The participants are distributed vertically, as well as horizontally, throughout the organization.

An essential part of the enlarged project included a 167-item survey of participants to see how they used paper, time, and telephone. The survey was supplemented by a three-week log to record actual time and usage.

The tabulated results of the survey will provide a benchmark for comparison with a matching survey to be conducted at the end of the pilot. But the initial returns from the survey surprised everyone connected with the project.

"We must have set some kind of record," Roy Barron said. "We turned out to be more paper-intensive, more information-intensive than any other group they'd seen."

"It was startling," McDowell said. "We tend to think of things like banks as paper-generators. But our survey showed, for example, that Alabama Power had more copy costs than any insurance company we'd seen."

One reason for the intense flow of paper and information through the organization is the public scrutiny with which a utility must live. Legal, accounting, and engineering departments within the corporation are constantly producing reports for regulatory agencies.

McDowell pointed out that the greater an organization's use of paper and data, the greater the potential savings with carefully designed and integrated office information systems.

The system makes working with complex budget data much easier than preparing budget reports by hand.

"We've set specific objectives which are both challenging and realistic," he said. They include items like reduced costs of paper and time from memo production and document generation to freeing of floor space from reduction in file storage.

Installation and training

All participants in the pilot program received intensive training appropriate for their workstation configuration. This training covered DECmate word processors, Rainbow personal computers, and the ALL-IN-1 office menu.



Working with Digital's system is much easier than preparing reports by hand, according to Paula Bryan, assistant to the vice president, human resources, and manager of user support for the pilot.

Paula Bryan, assistant to the vice president for human resources and a steering committee member, explained that grouping participants according to their experience with computers made training groups more efficient.

"We integrated installation and training," Bryan said. "The equipment for which people were being trained was installed while they were in training. We found there's less forgetting when people can get in there and experiment immediately with what they've just learned."

Beyond efficiency

People who have used the system to alter the way they handle some of their projects are enthusiastic about immediate savings of time and energy.

"There's an agenda I'm responsible for preparing," reported Mark Carter, MIS support manager, "and it used to take me five to six days a month. It typically went through at least three iterations, and then back for final typing in single space, and then out for manual distribution. The agenda almost needed an agenda. Now it takes me all of about 30 minutes in one day."

Some of the enthusiasm comes from the benefits of new varieties of information. The spot comparisons which have been used to compare corporate operating divisions can be skewed by random or unique events, noted Elmer Harris, executive vice president. They can now be replaced by trend-line analyses, which reveal more fundamental characteristics.

Shirley Thomas, a member of the steering committee, is executive assistant to Jesse Vogtle, executive vice president. As a member of the first user's group, she recalled that soon after the group began work, it became clear that the benefits of automation went beyond improved efficiency.

The greater an organization's use of paper and data, the greater the potential savings with carefully integrated office information systems.

In particular, Thomas has found the system makes working with complex budget data much easier than preparing budget reports by hand.

"I spend 10 minutes at it now. I love it," she said. "Before, I figure, with getting the data and doing the calculations and putting the things together and typing the final draft, I put in six to eight hours."

Some people have discovered a dimension of time savings they had not expected. Jim Poole, assistant manager of support services, said the first test of the system involved an initial plan to spend a whole weekend to prepare an operational budget report in order to meet a self-imposed deadline.

"It was partly a personal thing," he said. "So I started work Friday afternoon around 3:30 p.m., and I was going to work Saturday and Sunday to get the thing done. To make a long story short, I finished the final report Friday around 5:30 p.m."

Projections

The hardheaded economies of time and money at Alabama Power promise to be substantial, but they are only the beginning. The same kind of vision that inspired a steamboat captain is evident as people look to long-term changes in the very fundamentals of work.

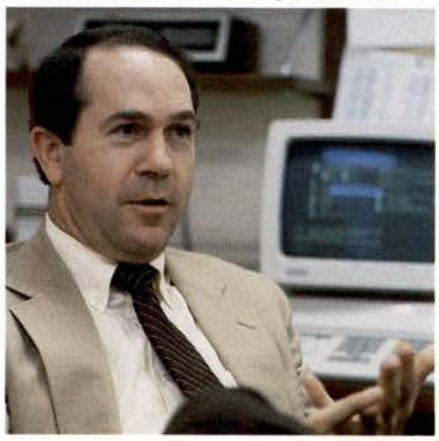
"Telecommunications, office automation, and data processing are all becoming one technology," Harris said. "Instant access to integrated information will change organizational structures and redistribute authority. Within 10 years we'll see drastic change in how people work in an office environment."

For Mark Carter, "The terminal on a user's desk will become the fundamental tool, a necessity. Even now I can get data from any accessible storage system, manipulate the numbers, add graphics, incorporate the text of a document, and distribute it over an electronic network."

"It's no longer easy to say where 'office' information starts and stops."

Clifford Capps, manager of management information services, pointed out that data definitions themselves are changing rapidly as the access routes become more integrated. "For example," he said, "it's no longer easy to say where *office* information starts and stops. The definitions depend increasingly on the job you need to do."

The redefinition of data and the linking of data bases raise new possibilities for long-range planning, according to Randy Hardigree. Statistical models of all kinds, such as those dealing with energy resources and demand, are essential to the work of his corporate planning department.



Clifford Capps, MIS manager and steering committee member, is responsible for the implementation of the pilot OA system.

"The more data we have access to, the better models we can build," Hardigree said. "We're looking forward to linking databases so we have a pool comprehensive enough to take all needs into account."

In the meantime, the new headquarters building rises to take its place in the Birmingham skyline. A visitor asked Roy Barron whether planning for the move was on schedule.

"We are proceeding," Barron said, smiling, "with diligent haste." ■

Linking insurance broker's global affiliates

Digital's network architecture ideal for Corroon and Black

By David Locke
InterOffice Staff Writer



Corroon and Black has expanded through merger and acquisition. For the insurance intermediary's further growth, distributed processing and networking are essential to communications, according to Gerald W. Cusack, vice president for management information systems.

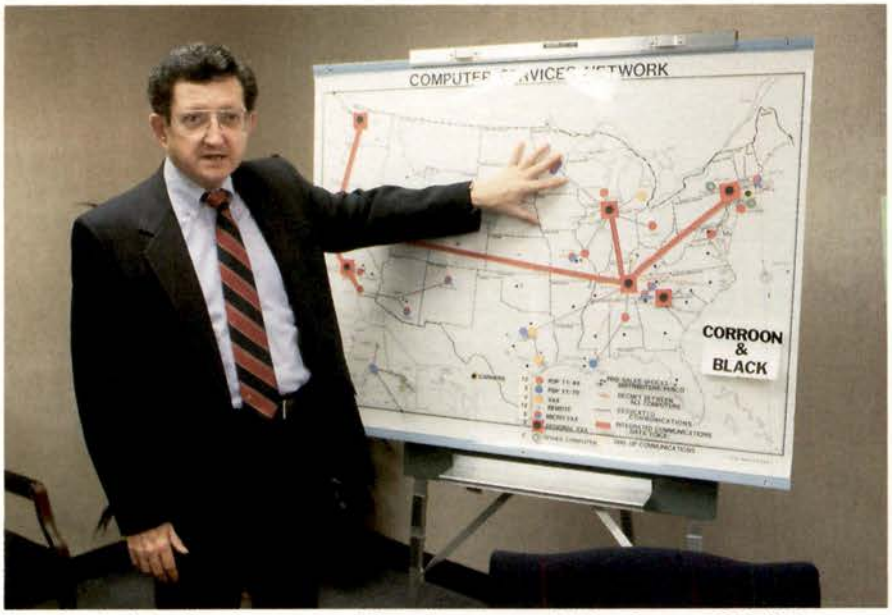
At Corroon and Black Corporation's national data center here in the Music City, Nashville, Tennessee, a cluster of three VAX-11/780 computers and a VAX 8600 computer has solved the problems of size and flexibility for this international insurance services firm.

"The configuration gives us the functional power of a mainframe," said Roger Turnbow, director of computer systems and services. "But we've also got the reliability of non-stop redundancy that's not characteristic of mainframes.

"Any one of 500 terminals in the building can access a single bit of stored information through any of the processors, and the routing is transparent to the user," Turnbow said.

Each processor in the cluster has been upgraded to 16 megabytes of main memory. The cluster, with several PDP-11 computers, controllers, printers, and a total of about 12 gigabytes of disk and tape storage, are housed in a multi-million dollar computer facility dedicated in June.

"The beauty of this arrangement is its



Gerry Cusack, vice president for management information systems, explains how Corroon and Black's data centers, now being installed, will expand local office capabilities.



Hank Tenney, national operations director, left, and Roger Turnbow, director of corporate systems and services, recall moving day at the new computer services facility. In the background, the VAX cluster.



John Oakley, Digital senior software consultant, explains how Corroon and Black's application needs have led to the development of specialized software packages.

"The configuration gives us the functional power of a mainframe."

flexibility," said Bob Vermilye, manager of VAX technical support. "If we need a bigger engine, we can add more power easily." In fact, there are plans to install the next generation of the VAX computer on the cluster as soon as it is available.

With corporate headquarters in New York City, Corroon and Black is the sixth largest insurance intermediary in the United States, specializing in risk analysis and insurance management for corporate and institutional clients. Around-the-clock operation of the Nashville center helps support a worldwide staff of 3,000 insurance professionals and a complementary network of affiliated and correspondent brokers.

The center supports approximately 500 on-line terminals at the Nashville facility. The Benefits and Specialty Sales Group, one of four corporate divisions, uses just under half of those terminals to manage and process claims for group benefit plans involving nearly a quarter-million employees.

The computer center also supports the Brokerage Services Group disaster/recovery processing for Nashville and 17 stand-alone computer sites, as well as corporate applications which include cash management, pension, payroll, and an employee savings and stock investment plan. In addition, a programming section uses the computer center facility to develop applications packages.

The center is part of a two-year expansion program under the guidance of Gerald W. Cusack, vice president for management information systems. The expansion program will include the development of five regional computing centers to serve local offices around the nation.

Although Corroon and Black was established in 1905, the corporation's major growth has been achieved over the last 15 years by a process of merger and acquisition. Now offices and affiliates are scattered around the globe. "For an international broker which has grown the way we did," Cusack said, "communication has become one of our largest problems."

Dedicated lines, initially between New York, Nashville and Chicago, but eventually linking all major centers, will provide the communications routes. "Distributed processing is the only thing that really makes sense for us," Turnbow said. "Digital's network architecture is ideal for what we need and for what we're doing."

Around-the-clock operation of the Nashville center helps support a worldwide staff of 3,000 insurance professionals and a complementary network of affiliated and correspondent brokers.

Local offices, according to Cusack, will continue to handle their own accounting needs on a stand-alone basis. However, the regional offices, each built around a VAX 11/750 or 11/780, will give those offices access to the network, to each other, and to applications packages and computing power they could not afford to maintain on their own.



Bob Vermilye, manager of VAX technical support: "DECnet will provide the backbone for Corroon and Black's nationwide data network.



The Nashville computer center, dedicated in June, 1983, shares building space with two Corroon and Black corporate divisions—Benefits and Speciality Sales, and Brokerage Services. The center supports a worldwide staff of 3,000 insurance professionals in addition to a network of affiliated and correspondent brokers.

Each of the local offices will then be able to "contribute data to a corporate pool and draw from it as they need to," Turnbow said. "The central facility is not just a storage place. It's a place to merge the data streams, to develop national statistics which can then be returned to the local offices."

"Distributed processing often leaves local offices feeling left out in the cold," Cusack said. "We're attacking that problem directly at the source.

"Digital's strategy offers us the tools we need—communications, word processing, electronic mail, all the features of ALL-IN-1—to bring us together as a company."

The value of networking goes beyond internal communications, Cusack explained. Once the Corroon and Black network is in place, he said, "we will use it as a gateway to our insurance carriers, with policy information directly from our system in a productive feedback loop."

Networking of the sort Corroon and Black is implementing will be as important to individuals as to offices. Cusack emphasized that the goal is more than providing individual office automation applications. "We're starting at the executive level, including group CEOs and executive vice presidents," he said.

"Digital's strategy offers us the tools we need—communications, word processing, electronic mail, all the features of ALL-IN-1—to bring us together as a company."

"At that level performance figures are important. So our aim is to use the menu capabilities of ALL-IN-1 to bring the relevant financial data to each executive desk in several forms—numbers, spreadsheets, and graphics."

Information provided through networks will involve hardware savings in the long run, according to Cusack. "We can begin to distinguish between micros and workstations," he said. "We can ask how much information needs to reside on a particular desk versus how much information it can access through a network."

The development of new applications packages is an important part of corporate



Checking out the environmental safeguard system in Corroon and Black's multi-million dollar computer center are, from left to right: Morris Duke, communications technician; Larry Breckenridge, national hardware manager; and Bob Guill, communications technician.



Outside Corroon and Black's Nashville facility, Cusack chats with Tim Wesley, Digital's account representative.

policy in a period of rapid change in the larger world of finance. One of the VAX-11/780 computers is currently dedicated to that development work.

"Our producers need to be able to respond quickly to changing needs," said David Corlew, a director of systems development. "We're currently developing risk analysis packages which will allow our producers to draw specialized reports directly from a large database." Client prospecting and maintenance programs, premium and agency accounting, as well as rating- and renewal programs, are currently in development.

"We're proving the concept of networking, not just within a building or a complex, but in a worldwide distributed environment."

Requests for specialized applications, such as the prospecting system to handle a client list, are funneled to development through a User Information Services Steering Committee in each of the four major business groups.



Corroon and Black data center support staff include, left to right: Randall Bennett, data control manager; Cynthia Sullivan, data control specialist; Sam Ellis, data control supervisor; and Mike Williams, data control specialist.



Roger Turnbow, Corroon and Black director of corporate systems and services.

"New applications are not just sent out," Cusack said. "Users are responsible for making systems they request work. We require a memo of acceptance from the users' group to insure accountability, to keep up the flow of information."

In both development and applications at Corroon and Black a chief benefit of Digital Information Architecture is product compatibility. With a single operating system for the complete range of VAX processors, Cusack said, "I can run the same software up and down the whole line, responding to a changing business environment. If we'd installed a competitive system like IBM, when we moved from one of their systems to another, I'd have to scrap part of my software investment. With a company this size, I can't afford that."

"The beauty of this arrangement is its flexibility. If we need a bigger engine, we can add more power easily."

John Oakley, Digital senior software specialist under consulting contract to Corroon and Black, finds the challenges exciting. "Things are happening here," he said. "We're using ALL-IN-1 as a top-level menu system in a combined business environment and office application.

"We're proving the concept of networking," he said, "not just within a building or a complex, but in a worldwide distributed environment." ■

Erasmus University boosts computing power with Digital's systems

Rotterdam's Erasmus University is a classic example of an organization that came relatively late to large computer systems, but has powered forward with total commitment.

At the end of the 1970s, Erasmus authorities realized that the university's one small, aging IBM® machine, together with its batch connection was inadequate not just for the university's computing needs but for longer term demands.

When the Computer Center was created in 1979, one of its first major decisions was to buy a DECSYSTEM-2050—a decision based on the system's price-performance combination and the fact that it suited the then small staff at the center.

"In 1979, some people at the university expected the system to last us quite a long time, say until 1985," said Dr. Marius Nagels, director of the Computer Center. "But it was hopelessly full after only three months."

That situation was remedied by upgrading the DECSYSTEM-2050, adding two additional megabytes, and extending the disk space with more tape facilities. But this provided only temporary relief. By 1982, the university needed still more capacity.

"By the end of 1981, the number of users had increased from 70 to almost 500. There was heavy demand in starting the computer center and it soon became apparent there were many computer needs to fulfill," Nagels said.

First VAX system

In 1983, Nagels and his colleagues considered buying a VAX-11/750 system. "We had two reasons," he recalled. "Because the machine was in use in other universities, an abundance of academic software was available. Also, the price-performance was excellent.

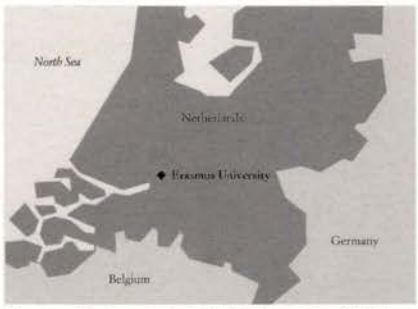
"And we expected over the long term, Digital would move from the 36-bit line to 32 bits. We wanted to open a second line to 32 bits in order to acquire knowledge and experience."

The VAX-11/750 system, with three megabytes of memory and 25 terminals, was installed that year to be used mainly for educational purposes and some research. "We found a broader range of available software than the DECSYSTEM-20 could provide," said Nagels.

Growth to support software

In 1984, the Dutch government decided that Holland's business management school, previously an independent institute, should become part of Erasmus. For the Computer Center, that meant sudden, considerable growth because the business school would need additional computer capacity.

"The need for more capacity was becoming urgent, in any case," Nagels said. "The addition of the business school to the existing facilities probably increased computer resource demand by about one-third."



Erasmus University is linked to two other Dutch universities via a DECnet network.

It was at this point that IBM offered to donate a 4331 mainframe to the university. But Nagels and the Erasmus authorities felt the 4331 would be costlier, and that it would provide fewer opportunitites for the whole university community. As a result, they bought a VAX-11/785 system.

Nagels said, "We were supporting a lot of software, much of it unique, on the DECSYSTEM-2060. At that time, sufficient VAX system alternatives were not yet available. We were confident, however, systems would be avilable in time for the planned replacement of the DECSYSTEM-20, scheduled for 1986. If not, we were prepared to wait."

Local Area Network

The university's VAX systems are located in several complexes. The VAX-11/750 is in the medical facility, eight kilometers from the other departments which the DECSYSTEM-20 and the VAX-11/785 serve.

Erasmus opened two local area networks, linking the three machines with one another, with some PDP-11 systems and terminal servers.

At the end of 1984, IBM offered another machine, a 4361. This time, Erasmus accepted the gift.

Nagels plans to connect one VAX system to the IBM's machine with an SNA Gateway. The 4361 will be available in early 1986.

Cooperation

According to Nagels, in the past year, the school realized the difficulty of supporting a large amount of hardware and many software packages. He said the center deals with about 50 applications packages and 15 languages.

"To overcome the difficulty, we began to discuss networks with two other Dutch universities that have a VAX-11/785 cluster. Together, we established a DECnet network, linking all three universities.

"This is ideal. The specialized support of the application packages is divided among us to share resources when some application is available in only one university. One university provides second-line support for both the packages and languages. It works very well."

Future growth

Erasmus plans to replace the DECSYSTEM-20 with a VAX 8600 to make a cluster with the VAX-11/785 system. The cluster will grow to as many as seven gigabytes of storage, 32 megabytes of memory, and have extra tape facilities.

"We shall continue to develop our local area networks with terminal servers," said Nagels. "We also know that some users with specific, heavy tasks don't require use of the VAX 8600. We plan to carry some of this load on the MicroVAX II."

Nagels also foresees the introduction of a Digital PABX (private automated branch exchange) system for both voice and data transport running alongside the local area networks, so that everyone—the number of workstations at Erasmus is projected to rise from 400 to over 1,000 by 1990—will have easy contact and connections.

Few problems

"We have had few problems moving to the VAX systems family," he said. "I think that's because from the beginning we always felt that programming should be done in a high-level language.

"We have moved away from macro programs to depend less on a specific system. We also have third-party packages on the DECSYSTEM-2060.

"However, some programs must be modified slightly for VAX systems. We are gradually reducing our supported DECSYSTEM-20 software for practically every package. There is now a VAX system alternative.

"Although the VMS operating system resembles Digital's TOPS in many ways, some users had to familiarize themselves with the different interface. But, in general, the transition process has gone very smoothly. I believe this will continue to be the situation."

Applications

Much varied research goes on at Erasmus, ranging from designing estimation models in econometrics to decision-support systems in business management. Similarly, the economics department uses large data collections like statistics by the Organization for Economic Cooperation and Development (OECD) and the International Monetary Fund (IMF) for models of the Netherlands and Europe.

"Our research depends heavily on computers, and we believe the extra capacity of the VAX system is a clear benefit to us," said Nagels. ■

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Experiments kept on track, within budget

VAXcluster system supports fusion research at GA Technologies

By David Locke
InterOffice Staff Writer



Cheap, clean, widely available electrical power edges closer to reality as researchers at GA Technologies power up new experiments designed to harness nuclear fusion—the energy of the stars.

Part of a multinational effort for decades, these experiments produce enormous quantities of scientific data and volumes of reports and papers. At the San Diego, California site, Digital Equipment Corporation's information systems process both data and reports, helping to keep the experiments on track and within budget.

"We cannot allow our computers to add to the risks the physics represents," said Glen Shephard, manager of the Fusion User Service Center. "That limits the acceptable vendors.

"Our Digital machines run well. They're reliable. That's why we chose them."

The fusion experiment, *Big Dee*, is

operated by the Doublet III Division of the Fusion and Advanced Technology Group. The Information Systems Division also supports the Fusion User Service Center.

A variety of Digital's products in the Fusion User Service Center support both Big Dee and the user group. Data from the experiment are gathered and stored temporarily by a VAX-11/780 computer at the experiment site. Eventually, a DECnet network carries the data to the main buildings where they are archived using a pair of DECsystem-10 computers.

A VAXcluster system supports data manipulation and communication to other users on the fusion network.

"When the experiment is running," said Shephard, "it produces about 500 megabytes to a gigabyte of data each day."

Like other numbers associated with fusion research, the figures are simply large. A visitor asked Shephard if he could offer some context for understanding.

"When the experiment is running, it produces about 500 megabytes to a gigabyte of data each day."

"We did some comparisons," Shephard said. "The data we generate at the experiment and transmit to the Digital systems here are about the same amount produced in a day by all the credit card transactions west of the Mississippi River and funnelled through the Bank of America processing center in Pasadena."

"It may seem to be a lot of hardware, but there's a lot of data, and we serve a large user community here," said Tony Glad, staff systems programmer with the experimental group. "We want the hardware itself to be transparent when a user logs on the system."

The user community at GA Technologies numbers approximately 500 people, and 100 might be on-line to the system when demand is at its peak.

According to Tim Hanlin, Digital account manager, a VAX 8600 system is on order for the experiment site, and a second for the User Service Center. A third VAX 8600 is expected to take over data-handling operations of the DECsystem-10 at the center.

"GA continues to be one of our most valuable customers," Hanlin said, "because they have been consistently willing to work at the leading edge of Digital's architecture and technology. That has meant sharing the difficulties of being out front, but it has given them the best of capabilities and encouraged us to stand with them."

The goal of GA Technologies' research and testing is to produce inexpensive electric power from nuclear fusion, rather than from the fission reaction which powers conventional nuclear plants.

The basic fuel in a fusion reaction is a plasma—an ionized gas in which electrons have been stripped from their nuclei. A kind of plasma is used in neon signs. In a star,



Glen Shepard, manager of the Fusion User Service Center: "It's reasonable to project that in the not-so-distant future, fusion might supply half the world's energy."

GA pursues high technology

GA Technologies was founded in 1956 as General Atomic Company with an initial mandate to explore peaceful applications of atomic energy. Now a wholly owned subsidiary of Chevron, the company offers a high technology product line including nuclear fuels, radioactive monitoring systems, thermoelectric generators, and other energy-related products that serve a range of commercial markets.

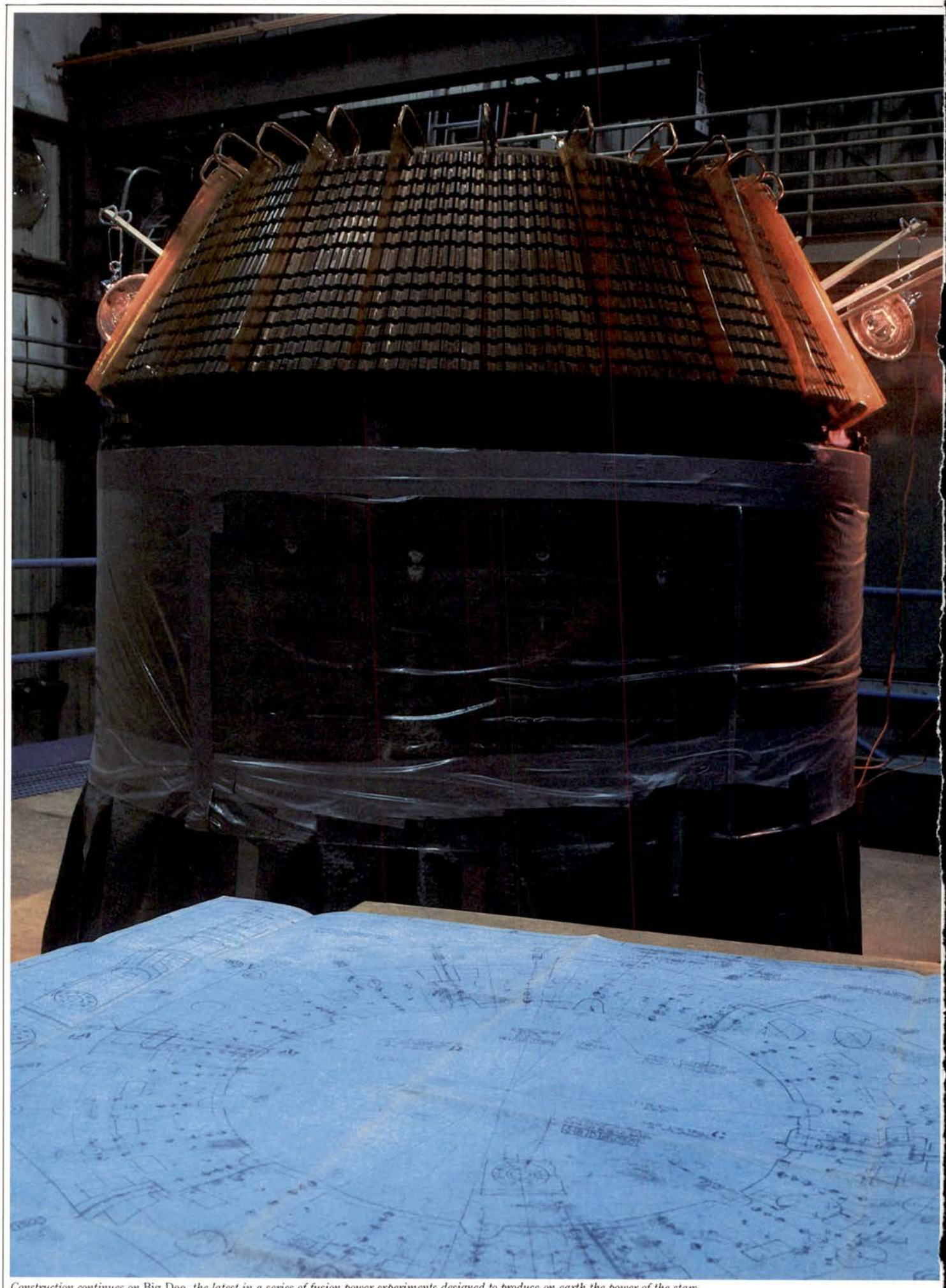
In addition to the fusion program, two other large-scale products distinguish GA's research and development efforts. The company's TRIGA® reactor is designed for teaching, research, and medicinal isotope production. Approximately 60 of these reactor units are in use or under construction in 22 countries.

Secondly, a high-temperature, gas-cooled fission reactor offers higher safety levels and greater efficiency than conventional fission reactors.

Fusion research and its promise of abundant electrical power have commanded a large share of the company's people and resources since the late 1950s, when GA efforts helped build the theoretical and experimental foundations of plasma physics. Different groups of electric power utility companies and the Atomic Energy Commission funded a significant part of these early efforts.

Current funding for fusion research, in addition to that from GA, comes from the United States Department of Energy, the Japanese government, and the Electric Power Research Institute, an American utilities consortium. Nearly one-third of GA's resources are committed to fusion research. ■

TRIGA is a registered trademark of GA Technologies.



Construction continues on Big Dee, *the latest in a series of fusion power experiments designed to produce on earth the power of the stars.*

extreme gravity compacts gases to a density unlike anything known on earth, and raises temperatures to nearly 15 million degrees Celsius. Nuclei of hydrogen collide and fuse, releasing energy in the form of neutrons.

To confine, stabilize, and heat a plasma to the point of self-sustaining fusion—the moment known as "ignition"—is the goal of researchers in magnetic fusion. Since one cannot obtain the stellar densities, higher temperatures are required, typically 10-15 times stellar temperatures, to obtain ignition conditions.

No materials known could confine such a plasma and withstand those temperatures. But plasma can be confined by powerful magnetic fields. This magnetic "bottle" can be altered to give the plasma its most efficient shape. A variety of sources heat the plasma until the threshold levels of ignition are reached, where energy out exceeds energy in.

"The concept isn't that difficult," said Dr. Philip Andrews, a staff physicist. "In a special stove, we're only trying to get this material hot enough so that it burns on its own. Then all we have to do is keep feeding in cheap fuel."

"We want the hardware itself to be transparent when a user logs on the system."

"This is one of the toughest scientific problems we have ever undertaken to resolve," Shephard said. "But the potential product is worth the work. It's reasonable to project that in the not-so-distant future, fusion might supply half the world's energy."

"It takes an enormous amount of energy, even just for plasma research," said John Lohr, a staff scientist with the fusion group. The experimental container for research is a toroid, shaped like a doughnut. The cross section of the unit now under construction looks like a *D*; hence, the nickname *Big Dee*.

The goal of GA Technologies' research and testing is to produce inexpensive electric power from nuclear fusion.

The plasma experiment itself requires pulse power of about 750 megawatts, nearly one-third the capacity of the San Diego Gas and Electric Utility. For about 15 minutes, two huge motor generators siphon power from the grid under controlled conditions during off-peak periods. This power is then stored into the experiment, ready to provide a high power over a period of several seconds.

Since plasma itself cannot be touched or measured, ranks of sensors throughout the container vessel monitor hundreds of conditions as the experiment runs: magnetic forces, currents, and the like. For example, light from a ruby laser fired into the plasma is scattered by the plasma electrons, revealing information about temperature and density.



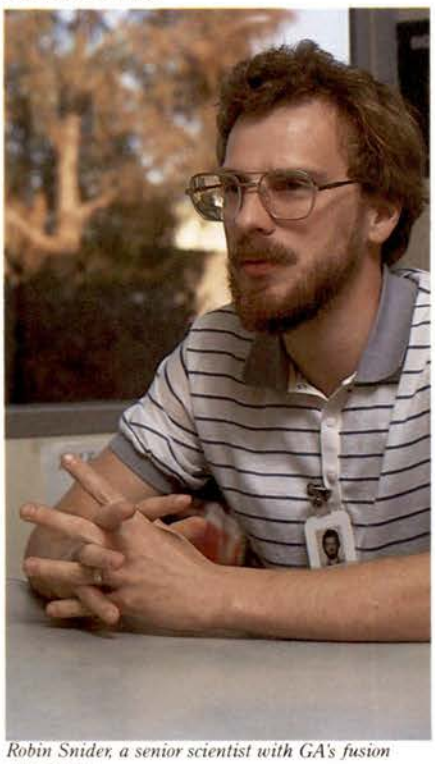
According to Dr. Philip Andrews, a staff physicist, plasma for the fusion experiment is heated using a special stove. When the plasma reaches threshold levels, ignition is achieved.

Robin Snider, a senior scientist with the fusion experiment, is currently at work on procedures to sort through the mountain of data produced from each *shot*.

"We're installing another VAX processor to run command procedures I've developed to sort some of this data," he said. "The portability of code from machine to machine is essential to this work. It's one of the reasons we're using Digital."

Other staff members at GA are similarly satisfied with the Digital computers that support the experiment and the User Service Center.

The energy demands for research are enormous, says John Lohr, staff scientist. The plasma experiment itself requires nearly one-third the capacity of the San Diego Gas and Electric Utility.



Robin Snider, a senior scientist with GA's fusion experiment.

"Most of my background was with large mainframes, batch processors," said David Caruso, a systems engineer. "I wasn't prepared for what the VAX systems offer—like help fields and well-written documentation.

"With Digital I found how easy it is to use a computer system," he said.

"The portability of code from machine to machine is essential to this work. It's one of the reasons we're using Digital."

Since the project does not yet produce power, in a very important sense, its main product now is shared knowledge in the form of papers, proposals and reports, said Betty Miracle, a composition specialist with the project.

"It's like working with a university faculty who are constantly producing," she said. Miracle is responsible for producing reports which within a year may include 18-20 conference papers, a dozen seminar papers, and perhaps 50 journal articles.



David Caruso, GA systems engineer.



Betty Miracle, composition specialist, is responsible for producing conference and seminar papers and journal articles for the shared information network.

"Betty Miracle is absolutely essential to the functioning of this facility," Shephard said.

Miracle uses TEX™, a word processing and composition program which was modified by Dr. Andrews to run on Digital's VAX computers. It was enhanced to support laser printers.

Since TEX is written in several languages, Digital's system capacity to handle those languages made it easy to get the program up and running, Andrews said.

For Merry Maisel, senior technical editor with the fusion program, word processing supported on the VAX processor has become a fundamental component of her work.

"I do some brochures and things like that, but my primary work is in writing proposals," she said. "I can't imagine working in this kind of environment without word processing capabilities. I'd do a fraction of what I do now."



Kristi Keith, staff systems programmer: pleased with the performance of Version 4.0 of Digital's VMS.



Merry Maisel, senior technical editor.

Networking has recently become important to Maisel's work, too. "I've become a slave to the thing," she said. "It's better in some ways than a telephone, and it seems to me that standalone word processing is rapidly becoming obsolete."

Keeping the software systems running smoothly and without interruption for the hundreds of users is the responsibility of Kristi Keith, staff systems programmer.

"Digital processors are the heart of the communications network."

"We're supposed to be transparent, all the wheels and gears out of sight," Keith said. "We're not perfect, but Digital's operating systems help us make it most of the time. Version 4.0 of VMS proved relatively easy to install. The changes are very useful, and I've been pleased with the way it's laid out."

Unlike most high technology research, magnetic fusion experiments are in the public domain. Funded in a large part by the U.S. Department of Energy, the experiment at GA Technologies is part of a national program, which includes nine national laboratories and several universities and industrial sites.

These sites are linked on the Magnetic Fusion Energy (MFE) Network, also accessible to hundreds of institutions and universities throughout the United States.



According to Shepard, Digital helps GA Technologies remain competitive in fusion research.

"The whole network has a substantial investment in Digital," said Shephard. "Digital processors are the heart of the communications network."

The network is satellite-linked with key processors at Lawrence Livermore National Laboratory at the University of California. Members on the network can share software and data and coordinate research.

Digital's communications capabilities made it the processor of choice for the network. "MFENet is a software protocol," explained Keith. "It runs on Digital's machines throughout the fusion community in the United States."

"The whole fusion program is unique in the amount of international cooperation involved," Shephard said. Data and programs are shared around the world, including sites in Australia, China, Japan, the USSR, and several European countries. Public domain research cuts costs by eliminating duplication and the expense of secrecy.

Within the larger cooperative effort, however, there is room for significant competition in terms of economies and efficiencies.

"Digital helps us remain competitive," Shephard said. "We do things better at less cost than other labs. That's why we remain a key part of the fusion program." ■

TEX is a trademark of D. Knuth of Stanford University.

A retailer with "low margins" and "a large market share"

Tailored "Colesnet" links distribution centers for G.J. Coles

By David Locke
InterOffice Staff Writer



Firm management and a commitment to quality merchandising have guided G.J. Coles and Company, Ltd., from the opening of its first outlet in 1914 to its position as Australia's largest retailer.

"Coles is part of the weave of the Australian fabric," said Richard Thomas, general manager for public relations. "It was often said that no matter how small a country town, one could always find a pub, a church, and a Coles store."

Coles employs just over 82,000 people in all of its operations. The company's distribution of retail goods through more than 1,000 outlets last fiscal year generated sales of about 6 billion Australian dollars, or 4.2 billion in current U.S. dollars. The outlets include New World supermarkets, Coles Variety Stores, K-marts, Liquorland stores, Fays and Ezywalkin shoe stores, and Katies women's fashion stores.

The company is expanding its Norgen-Vaaz retail ice cream franchises and has opened two "Look Alive" specialty clothing outlets in the state of Victoria. In addition, the recent deregulation of banking in Australia makes Coles' 25.1 per cent stock interest in the Bank of America (Australia) Ltd. a likely route to retail banking.

A computer network built around

Digital Equipment Corporation's VAXclusters keeps goods flowing smoothly through this complex system. A VAXcluster system at each of five regional distribution centers controls inventory, stocking, purchase and store orders, distribution, and shipping. An additional cluster at company headquarters in Melbourne is used for administration and software development work.

"Nothing over two shillings, six pence"

Coles' growth from a single small store in a Melbourne suburb to the present nation-spanning operation derived in large part from a set of operating guidelines evolved and practiced by Sir George Coles and four of his brothers, all of whom were knighted.

From its beginnings, Coles aimed to meet the requirements of the low- to mid-range retail market. Until the worldwide inflation of the 1930s took its toll on the Australian dollar, the company remained faithful to a pricing limit which became its nationwide slogan: *Nothing over two shillings, six pence.*

"You don't go to Coles for a Rolls-Royce," Thomas said, "nor if you're after a mink coat. If you're looking to feed and clothe an ordinary family and get value for your money, then you go to Coles."

New store expansion accounted for most of Coles' growth to a 93-store chain until the early 1950s. Beginning with the acquisition of other smaller retailing groups in New South Wales, Coles gradually broadened its scope and in 1958 added food outlets to its retail mix.

Discount retailing became part of Coles' operations in 1968 as a result of joint venture agreements negotiated with S.S. Kresge Co. of the United States. The first K-mart in Australia opened the following year, and by 1977 there were 33 of the discount stores in Australia. In the following year, Coles purchased Kresge's share of K-mart in Australia in return for a 20 per cent stock interest in Coles.

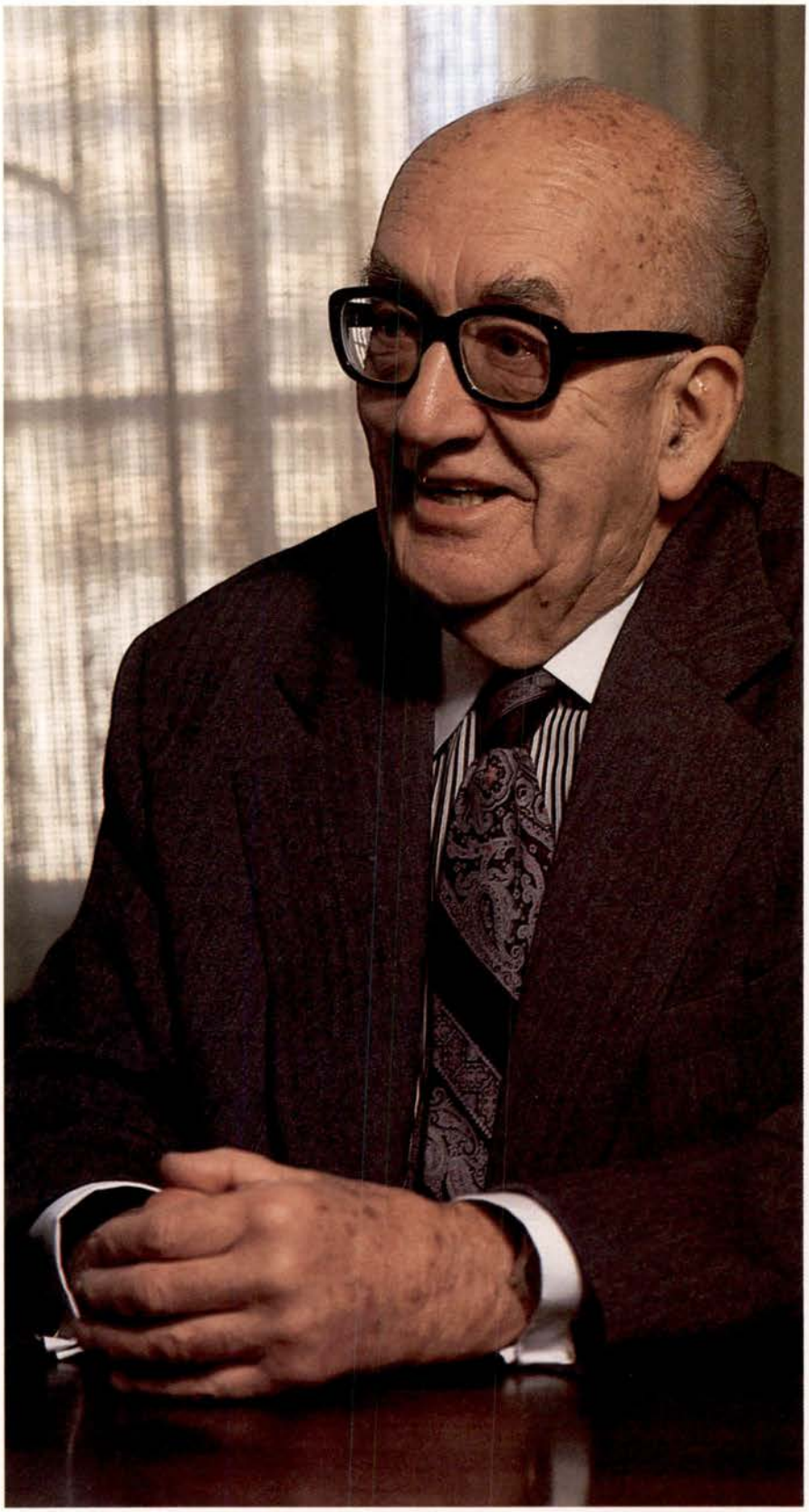
In pursuit of flexibility

Interest in automated data handling at Coles, especially in areas of inventory, order, and distribution began to grow in the mid-1960s. But senior managers returned from their first exploration of information processing installations in Europe and America in 1967 with something less than enthusiasm.

"If you're looking to feed and clothe an ordinary family and get value for your money, then you go to Coles."

"We must have visited 40 or 50 operations," said Sir Norman Coles, then managing director and chairman. "Only one of those we visited did not have to apologize for being down. They all had problems. So we chose to wait.

"We were not under intense pressure," Sir Norman said. "We were selling our goods, getting our money in the bank, our stocks were up, and we were paying good dividends. We could wait. In retrospect, it was well we did."



Sir Norman Coles, former managing director and chairman, headed the company's second computer review tour. He looked for "breadth, accuracy, and speed" in a computing system.

Corporate expansion and acquisitions in the latter part of the decade, however, did load the manual order-inventory-distribution system to its limits. Some kind of automation had become essential.

Sir Norman headed a second computer review tour which again examined large retail operations in the United States, in England, and on the continent. By that time, according to Sir Norman, the group could report to the executive committee that "the equipment had improved tremendously. We believed that the time had come to automate."

But important cautions remained. "We were careful to get what we wanted rather than what a salesman wanted to sell us," Sir Norman said. "Above all we wanted flexibility. We knew that our needs would change,

and we wanted a system we could enlarge and tailor to our requirements."

In addition to flexibility, Sir Norman recalled that three other issues structured the decision on automated information systems. "We wanted breadth to integrate information from all points where goods moved, from corporate buyer to point of sale. We wanted accuracy. And we wanted speed to get that information directly to the people who need it."

"Above all we wanted flexibility. We knew that our needs would change, and we wanted a system we could enlarge and tailor to our requirements."

The first of Digital's computers in the PDP series were delivered in April, 1976. With expansions and additions, the Coles' system is now built around clustered VAX computers located at company headquarters in Melbourne and at five centers around the country.

The installation began with a pilot project, according to Neil Thornton, director of information systems and a member of the second survey team. The pilot, including the Port Melbourne distribution center and three stores, was built around a pair of PDP-11/70 computers.

"Several things were impressive during the pilot," Thornton said. "We liked the on-line capacity, the number of transactions the system could handle. The ease of getting up was a distinct advantage to us."

Distributed processing

Under the current system, individual Coles stores assemble their orders using bar-code readers, and transmit those orders between midnight and 4 a.m. over dial-up lines to their distribution center. That captured data is converted into picking slips. These slips direct the preparation of an order which is typically shipped out to the ordering store within 12 hours.



David Botherway, controller for operations and technical services in the information services department.

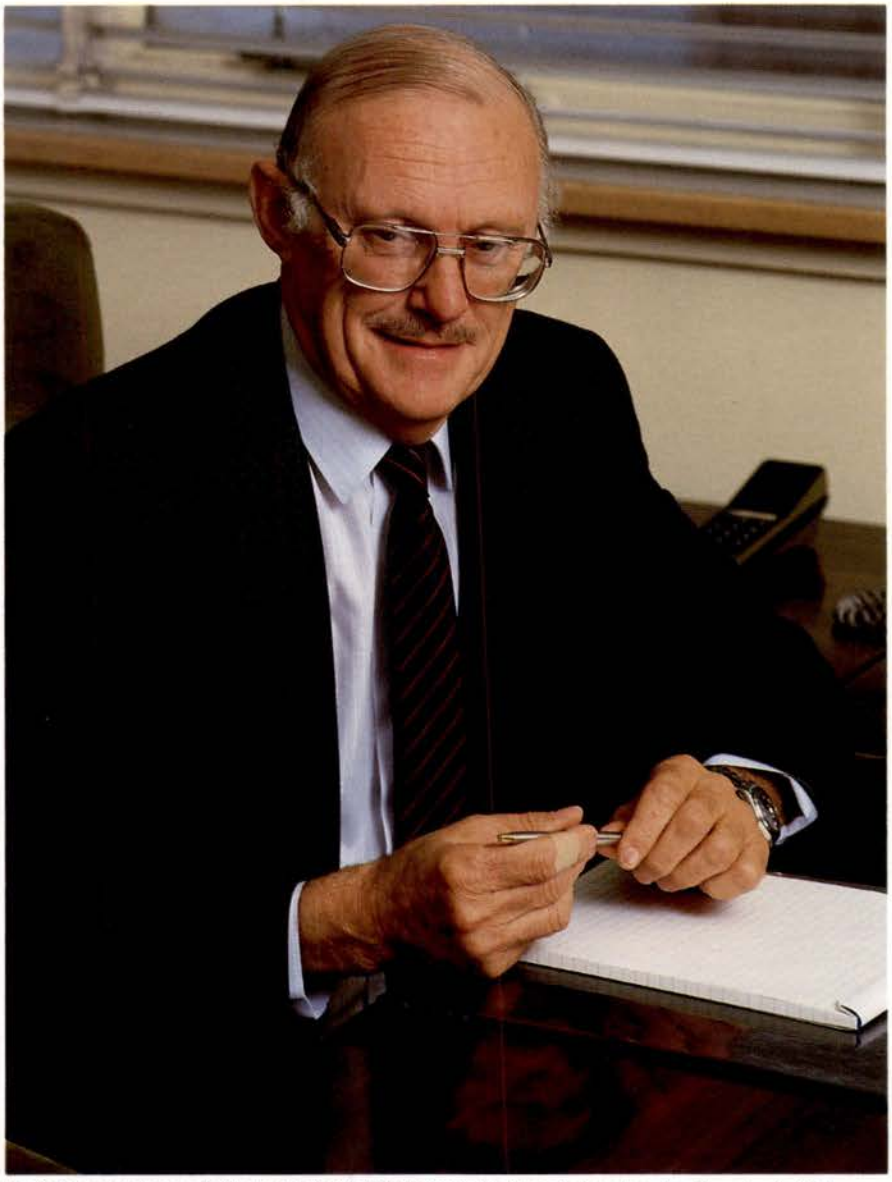
"The order process is time-critical," said David Botherway, controller for operations and technical services in the information services department. "Since the process runs after midnight, we can't expect any service agent to get here in time to pull us out of an emergency.

"The VAXcluster has built-in redundancy. It's the cornerstone to the order operation."

"The VAXcluster has built-in redundancy. It's the cornerstone to the order operation."

In addition to capturing data from individual stores, the system prepares an invoice for the ordering store, forwards to corporate buyers a daily report on stocks, and prepares a profile of suggested buying.

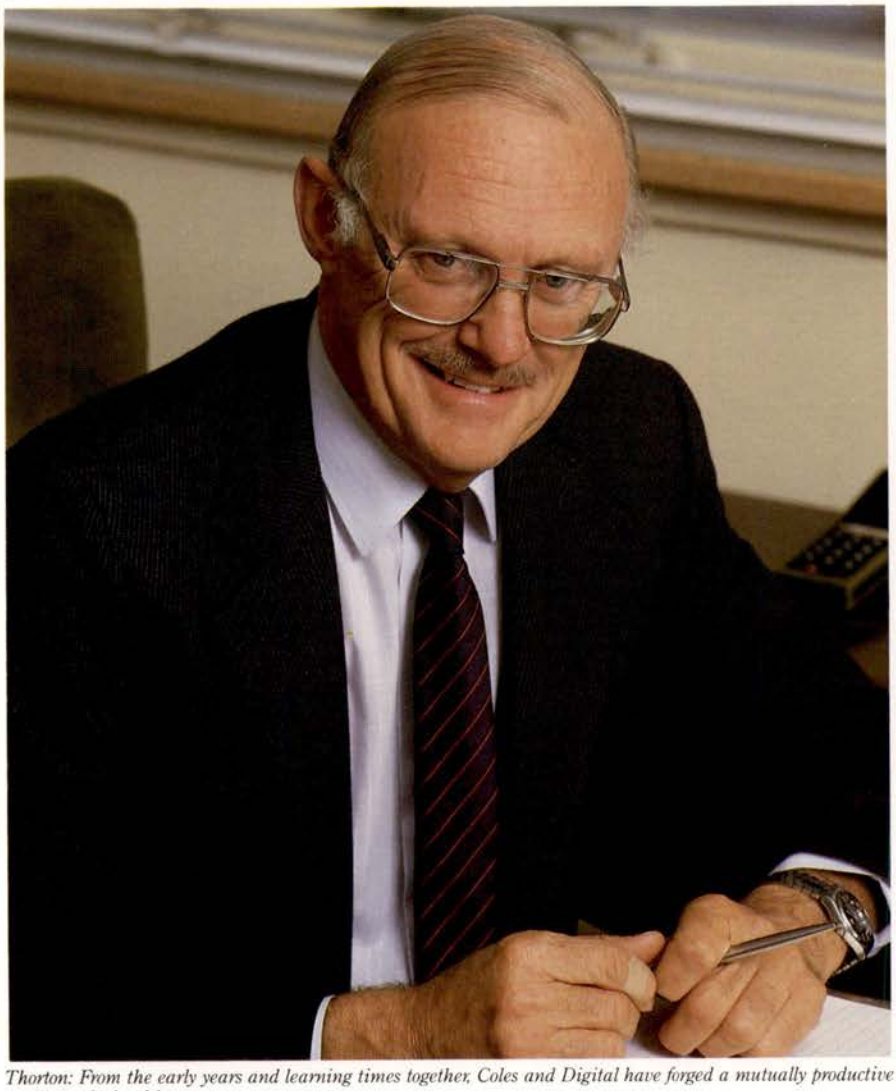
"Ours is a regional distribution system," said Ronald Vimpani, senior controller in the information systems department. "We need the flexibility of distributed information processing which Digital makes available."



The Coles' system is now built around clustered VAX computers located at company headquarters in Melbourne and at five centers around the country, says Neil Thornton, director of information systems.



"Ours is a regional distribution system," says Ronald Vimpani, senior controller in the information systems department.



Thorton: From the early years and learning times together, Coles and Digital have forged a mutually productive working relationship.

The complete integration foreseen by Sir Norman Coles is still being developed, said Christopher Bronner, controller for distribution systems with the information services department. His group is working on systems to track storage pallets and to integrate costing procedures for each of the distribution centers.



Christopher Bronner, controller for distribution systems with the information services department.

"Digital's VMS operating system is easy to work with," Bronner said, "and new system installation goes smoothly. It's amusing to watch people not accustomed to working with Digital learn that we can install a system overnight and sit down to use it the next day."

"Coles have earned the mark of a dynamic and responsive company in retail sales."

A network called "Colesnet" links the five regional distribution centers. According to Vimpani, Colesnet began with Digital's DECnet network, which has since been modified and tailored to meet the special needs of the five centers.

Traditions supporting expansion

Even as an integrated inventory system takes shape for the retail operation, Coles' managers have turned their attention inward to information management for the office system.

Stella Minahan, manager of office information, was recently selected to review, plan, and oversee the installation of an office system at Coles. "Word processing still makes jaws drop in some corners, so we're beginning with needs analysis and a thorough program of education," she said.

A detailed study will provide baseline data regarding the nature of information used by managers, of their communication patterns and data needs. Minahan's plans include a steering committee to direct installation efforts and a pilot project to help illustrate the power of integrated office information systems.



Stella Minahan, manager of office information. Her plans include a steering committee and pilot project.

"Coles have earned the mark of a dynamic and responsive company in retail sales," she said. "My goal is to help extend those traditional strengths to realize fully all the company's managerial talents."

Several factors underlie Coles' continued growth, according to Richard Thomas, general manager for public relations. Historically, the company has sought out good locations and worked to be a good neighbor in the communities it serves.

Staff loyalty distinguishes the Coles operation, he said. Part of that results from policies initiated during Sir George Coles' earliest years, including promotion from within the company and a profit-sharing plan that permeates well down through the staff ranks.

"Coles have always kept low margins," Thomas said, "which is one reason they've got and held a large market share." Margins are lowest in food, higher in other retail operations and average out just under two per cent.

Currently all of Coles' stores account for approximately 11 per cent of retail sales in Australia. Collectively, Coles, Meyer, and Woolworth's service approximately 25 per cent of the nation's retail market.

"Coles have been consistent in their concentration on what they do best—on retailing," Thomas said. Unlike some other retail groups, Coles did not explore real estate development or manufacturing ventures. "To borrow a phrase, they have stuck to their knitting."

From the early years and learning times together, Coles and Digital have forged a mutually productive working relationship, according to Neil Thornton, director of information systems. "With us, Digital learned some things about commercial applications," he said, "and we learned about flexible information processing. In the sum of it, Digital have been good for us and we've been good for Digital." ■

"Turned on people using good tools"

GMF Robotics programs operations for leadership

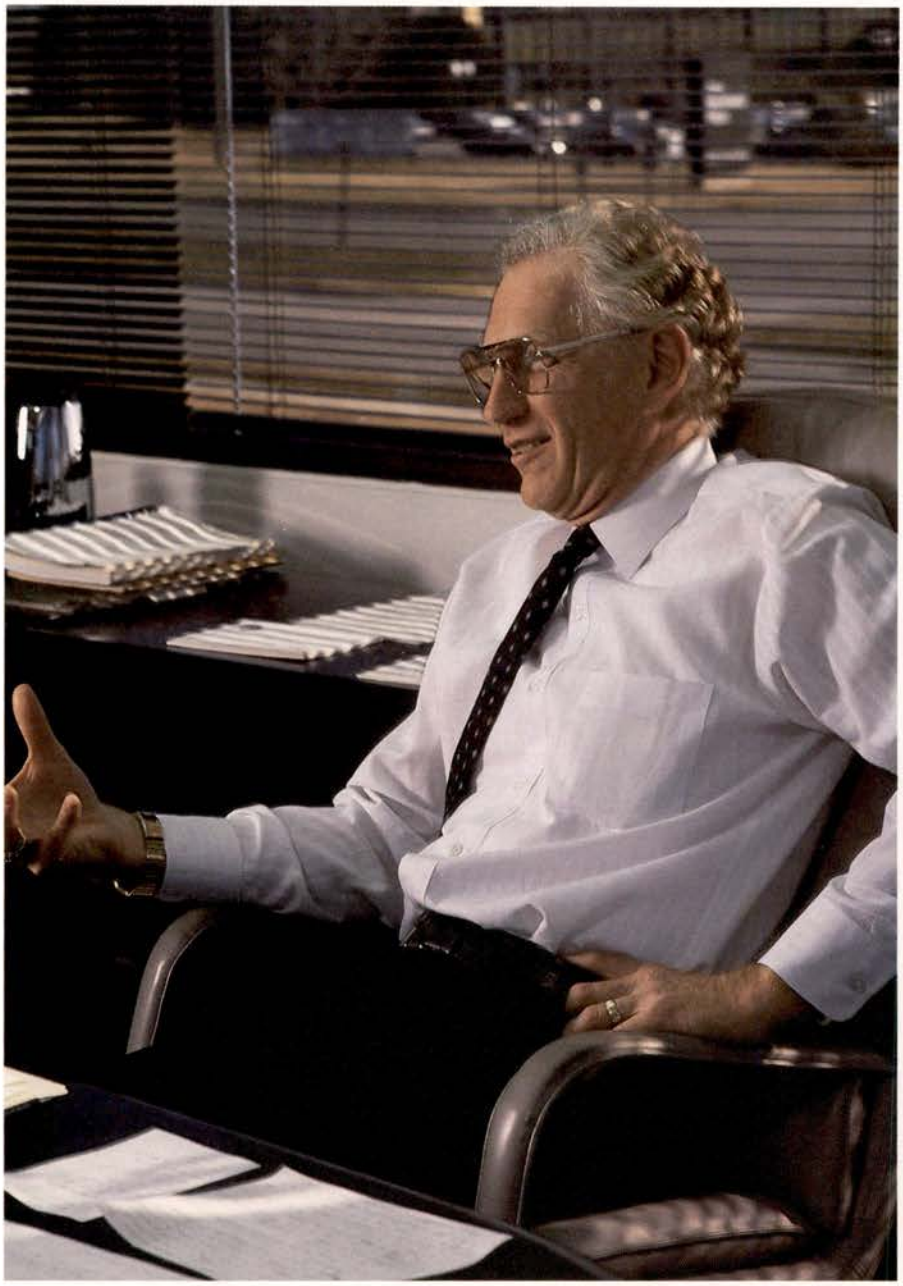
By Jim Meade
InterOffice Staff Writer



A model of one product of GMF Robotics, today's industry leader in the United States.

Within three years, GMF Robotics of Troy, Michigan, has become the leading robotics company in the United States, and Eric Mittelstadt, president and CEO, attributes its success to "turned-on people using good tools."

As dedicated to automating its own operations as to standardizing other companies' manufacturing, GMF uses Digital's tools for all its data processing. "If we are going to be high tech, we had better operate that way ourselves," said Mittelstadt, who



GMF's profits can be attributed to "turned-on people using good tools," says Eric Mittelstadt, GMF Robotics' president and CEO. He mandated a workstation for every desk.

losophy, GMF used automation to accomplish more with fewer people. Already committed to Digital Equipment Corporation for engineering, computer-aided design, and computer-aided manufacturing applications, GMF chose to stay with a single vendor to automate its office systems.

"We are strongly committed to distributed processing," said Arvid Martin, manager of GMF's computer and information systems. "We felt Digital had what we needed to support our total activity."

GMF's equipment needs have grown with the company. Beginning with one VAX-11/780 in 1982, GMF has now clustered two VAX-11/780 computers and two VAX-11/785 computers, with a total of 40 megabytes of memory. By the end of the summer of 1985, two of Digital's VAX 8600 computers will join the cluster.



"We are strongly committed to distributed processing," said Arvid Martin, manager of GMF Robotics' computer and information systems.

mandated a workstation be purchased for every GMF desk.

"Everyone in our company is trained to use ALL-IN-1," said Lee Ann Kantner, GMF's VAX systems supervisor.

Established in the summer of 1982 as a joint venture by General Motors Corporation and Fanuk, Ltd. of Japan, the goal of GMF Robotics was "to bring the benefits of robotization to car making as quickly as possible in the decade of the 80s." GMF surpassed its own objectives by achieving profitability two years ahead of the 1986 schedule. By the end of 1984, sales of more than $100 million had boosted its market share from third to first, with 27 per cent of the U.S. market.

Single vendor

In 1982, when the young company said it intended to become the industry leader, people said, *There is no way they can do that because they don't have enough people,* according to Mittelstadt.

But, Mittelstadt countered, GMF had good people. And, true to corporate phi-



Lee Ann Kantner, GMF's VAX systems supervisor. All employees are trained on Digital's ALL-IN-1 office and information system.

The fully clustered configuration allows for data processing activity to be shifted to another computer in the cluster if too heavy a load is placed on one computer. "All that is noticed by the user is that response time gets better," said Mike Ludlow, data processing supervisor.



With the fully clustered VAX system, users only notice better response time, says Mike Ludlow, data processing supervisor.

The computers support 320 users on 200 VT100 terminals, 17 DECmate II word processors, 15 Rainbow personal computers, and one Professional 350 computer.

The all-Digital solution saves money in a number of ways, said Martin. "It means we only need one system staff, and our training costs are lower because people are already familiar with the equipment."

Integrated Office Automation

GMF has installed not just an office system. Rather, it has installed an *integrated* office system, according to Ludlow. "Integration of the different pieces is what I think is the biggest advantage of ALL-IN-1," he added.

Electronic mail is central to the smooth running of the GMF office applications. The mail network connects everyone in the Troy office to sales people from New England to California; to distributors; and, in special cases, to customers.

"Don't send me written memos, call, or just drop in," Ludlow has advised employees. "Use electronic mail." Electronic mail saves time, he said. It's convenient. It eliminates interruptions. "Even more than that, though," he said, "when you use electronic mail to say something, you have a stored document."

Beyond simple functions

Keeping track of what might get lost is the basis of the Lost Quote System, one of the ALL-IN-1 applications GMF developed. Engineers prepare job quotes for sales people to deliver to prospects. In pre-automation days, a sales quote would occasionally get lost in the shuffle, according to Martha Rudkin, ALL-IN-1 supervisor, who developed the application using ALL-IN-1.

Now the quotes are never lost. At 30, 60, 90, and 120 days, the application searches the database and checks status codes on the sales quotes. For any quote not updated, the computer sends a mail message to remind the sales person that the quote needs attention. At 120 days, the computer sends a message to the sales manager as well.



Martha Rudkin, ALL-IN-1 supervisor, developed the special Lost Quote System for GMF Robotics.

Another system keeps track of Improvement Development Requests. A user, for instance, might request a report of "receivables aged 30 days." Every time status on that request changes, a letter is automatically sent to that user.

Roger Schamanek, group manager of engineering and manufacturing, uses ALL-IN-1 to calculate merit raises with spreadsheets, create a single mail message to inform a number of employees of those increases, edit the message mail before sending it, and then send each employee a personally tailored notification. Schamanek added, "We haven't even scratched the surface of what we can do with ALL-IN-1."



Maryellen Orr, office automation instructor. Vice presidents trained on ALL-IN-1's editor were amazed by its functionality.



"We haven't even scratched the surface of what we can do with ALL-IN-1," says Roger Schamanek, group manager of engineering and manufacturing.

Outstanding Execution

Mittelstadt credits the people as much as he credits the tools for GMF's success. Specifically, he recognizes Arvid Martin, information systems manager, and his group for "outstanding execution in putting the system into place." Martin, in turn, praises the other members of his staff.

"We have a lot of enthusiastic people here," said Mittelstadt. "It is not unusual for people to work 12-hour days, and you see cars in the lot out here at six in the morning." Mittelstadt keeps a VT100 terminal at home so he can work in the middle of the night.

Lothar Rossol of the computer and information systems department is one of the two vice presidents who received training on ALL-IN-1 advanced features. Maryellen Orr, their office automation instructor, said, "I have trained them to use the editor. They were amazed at what it could do."

Reflecting on GMF's enthusiastic employees and modern tools, Jack Saunders, public communications specialist, said, "An enormous amount of work goes out of here in a day." He contrasted the modern GMF with the offices he knew 30 years ago when secretaries had to cut stencils to do what they now do with electronic mail.

There are no longer any stencils at the company whose own slogan for 1985 is *Programmed for leadership.* It is even hard to find a typewriter. "There are a few left—used mostly to type envelopes," conceded Orr.

After a moment, she added, "I'd like to get rid of the typewriters altogether." ■

Integrated network links databases

Lederle Laboratories "adventurous, bold" in research efforts

By Scott Cramer
Large Systems Marketing



Dr. George Sutherland of Lederle Laboratories was key to Lederle's acquisition of Digital's systems in the late 70s. His work helped to move the firm into interactive and distributive computing.

"How do we compete with pharmaceutical companies three to four times our size? We stay at the absolute forefront of computer technology," said Dr. George Sutherland of Lederle Laboratories in Pearl River, New York.

"I'm an adventurous person," continued the vice president and director of Lederle's Medical Research division. "I instruct my staff to be adventurous, bold. Our researchers require the best available computer resources. Sometimes this means walking away from a *tried and true* methodology. But we're willing to take chances."

Lederle Laboratories, an established leader in the pharmaceutical industry, is a division of American Cyanamid Company. Sutherland compares Lederle's Medical Research Division to "a mid-size pharmaceutical company with an annual budget of $100 million and staff of roughly 1,000 scientists."

However, he added, Lederle is unique. For the past 10 years, it has coordinated research activities and clinical testing on a worldwide basis. Most U.S.-based pharmaceutical companies, he said, operate through foreign subsidiaries. In 1977 Sutherland was instrumental in Lederle's acquisition of a DECsystem-10 and three PDP-11/34 systems, a move that ushered the firm into an era of interactive and distributed computing. Since then, Lederle's computer capabilities have added two DECsystem-10 and seven VAX computers, DECnet, Ethernet, and a wide range of Digital Equipment Corporation's software products. The firm is looking forward to delivery of its first VAX 8600 system this summer.



Establishing a worldwide heterogeneous network of workstations for Lederle Laboratories is one of the goals of Dr. William Zeitz, director of Medical Group Information Systems.

An integrated intellectual network

Lederle's worldwide activities are evident when Dr. William Zeitz, director of Medical Group Information Systems, described "an integrated intellectual network" of computer resources.

For example, using TYMNET™, Japanese researchers access a VAX-11/785 in Pearl River to transmit toxicology and clinical research data. In Gosport, England, a VAX-11/750 is used for product development and clinical research. The system also transmits data to the Pearl River DECsystem-10 computer. A VAX-11/750 on order will be used for toxicology research in Catania, Italy.

In the United States, Lederle and other American Cyanamid divisions share databases and computer resources. The Agricultural Research Division in Princeton, New Jersey, uses direct leased lines to access the chemical compounds database, which resides on three tightly coupled DECsystem-10 computers (also known as a DECsystem-10 TRI-SMP) in Pearl River.

The Chemical Research Division in Stamford, Connecticut, has a VAX-11/785 and a VAX-11/750 system. Researchers use DECnet software over dedicated phone lines to access the DECsystem-10 TRI-SMP.

The Davis and Geck Division, Danbury, Connecticut, which develops medical devices, accesses the TRI-SMP system over phone lines for data analysis. The division also uses an Intergraph™ CAD/CAM system (VAX based) to assist in the development process.

Additionally, the DECsystem-10 TRI-SMP is accessed over dial-up lines from American Cyanamid's corporate headquarters in Wayne, New Jersey. A third party financial modeling package is used on the DECsystem-10 computer.

At the Shulton Research Division in Clifton, New Jersey, a VAX-11/780 system has been installed for data analysis and manipulation.

One of Zeitz's goals is to establish a worldwide heterogeneous network of workstations, each of which can access the information no matter where or on whose computer it resides.



Lederle's move from DECsystem-10s to VAX systems is well coordinated, says Dr. Babu Venkataraghavan, manager of Global Research Computer Applications.

According to Dr. Babu Venkataraghavan, manager of Global Research Computer Applications, there is a wide range of Digital's equipment, including Rainbow 100 personal computers, VAXcluster systems, and the DECsystem-10 TRI-SMP systems, at Lederle's Pearl River facilities. A VAX 8600 system is on order.

On Rainbow systems, researchers tabulate scientific data and generate graphics using Lotus Development Corporation's 1-2-3™ and Dbase II® from Ashton-Tate.

Four VAX-11/785 computers, three of which form a cluster, are used for molecular modeling, drug design, and toxicology. Two VAX-11/750 systems are used in biological research labs, and two VAX-11/725 systems function as intelligent nodes for the Ethernet.

The VAX-11/785 cluster also runs Digital's ALL-IN-1 software, which, according to Venkataraghavan, will establish communications among the entire research community and allow upper management to track ongoing projects. Introduction of voice mail is planned for the future.

In preparation for Digital's computer-based information management system, an engineering study is under way to determine the best way to implement a local area network for 12 key buildings. Currently, the new Information Services Office building and the Toxicology Research building have Ethernet, connected via a fiber optic link.

At Lederle, the computer staff use VAX information architecture products, including DATATRIEVE, to store research data, generate reports, and provide query capabilities for the entire research community.

Moving to VAX systems

Over the next three to five years, Lederle plans to migrate applications from the DECsystem-10 TRI-SMP to a VAX environment.

The TRI-SMP system handles Lederle's research database, which contains years of chemical and biological research data. Updated daily and accessed frequently by scientists working on drug design and development, the database is the firm's most important source of information.

Venkataraghavan referred to the three DECsystem-10 computers and the research database as "integral parts of (Lederle's) intellectual network."

The research database is a compilation of many data sets. The major components are chemical compounds and biological data. The former is accessed by a staff-developed system called CLASS (Cyanamid Laboratories Automated Search System). The latter is accessed by System 1022®, a database package from Software House.

The staff also developed MIRACL (Medical Information Retrieval At Cyanamid Laboratories), an overall interface to data sets which functions as a shell and inner interface. With MIRACL, end users do not need to know where the data resides. The interface pulls data from both chemical compounds and biological databases.

Lederle's computer staff has set a number of goals for implementing the research database migration. In 1985, VAX/VMS training courses will be offered to researchers who until recently dealt exclusively with the DECsystem-10 computers. This is preparation for the migration of the research database to a VAXcluster system, comprised of the VAX 8600 and two VAX-11/785 computers.

In the VAX environment, Lederle plans to use Software House's System 1032™, a database similar to the existing System-1022, to access the biological data portion of the database. MACS, a database package from Molecular Designs, Inc., will handle the chemical compounds data portion of the database. Currently, the computer staff is experimenting with a Virtual Memory System (VMS) version of its MIRACL interface.

By the end of 1986, Venkataraghavan plans to have most of the research database transferred. Remaining systems will be transferred in late 1987, giving the computer staff time to finalize procedures.

"Our efforts to move from the DECsystem-10s to a VAX environment are both well-coordinated and aggressive," Venkataraghavan said. He believes that VAXes will provide the growth path that Lederle needs.

Since 1906, Lederle Laboratories has had a history of important discoveries in the pharmaceutical field. In this era of high technology, DNA research, and other innovative research methodologies, Lederle's scientists are discovering and designing new drugs to help man fight disease at record pace. ■

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For office, engineering, manufacturing at McDonnell Douglas Corporation

Microelectronics Center links 300 active users with ALL-IN-1, VAXcluster

By Ed Hewson
InterOffice Staff Writer



Anatole Browde, staff vice president at the McDonnell Douglas Microelectronics Center. The center wanted complete integration of all office and scientific applications. "When you have the opportunity to build a system from the ground up, it simply doesn't make sense to build it out of incompatible pieces."

Combat and commercial aircraft, space systems, and missiles demand highly reliable microelectronics systems. In 1981, McDonnell Douglas Corporation planned to build its own microelectronics facility to develop and internally produce computer chips, infrared detectors, and other integrated circuits for its divisions and the military.

By 1984, the McDonnell Douglas Microelectronics Center consisted of a 192,000-square foot facility in St. Louis, Missouri, and a 56,000-square foot facility in Huntington Beach, California. At both plants, offices automated with equipment from Digital Equipment Corporation contribute to making the Microelectronics Center the modern, efficient venture that McDonnell Douglas envisioned.

Anatole Browde, staff vice president at the Microelectronics Center, said the company was intent on using the latest high technology automation in the operation of this new high technology division of McDonnell Douglas.

"We wanted the best scientific computational capabilities as well as the most advanced managerial and office technology we could find," Browde said.

Behind the scenes at the St. Louis microelectronics facility is an office, engineering, and manufacturing computer system powered by a cluster of two VAX-11/780 and two VAX-11/785 computers. Other hardware includes two HSC50 intelligent disk controllers, four RA60 removable-media disk subsystems—each of which provides 205 megabytes of formatted capac-



Of the ALL-IN-1 system, Browde says: "It has increased my communications capabilities several times over." Browde's home terminal is linked to the plants in St. Louis and Huntington Beach, California.

ity—eight RA81 456-megabyte fixed disk subsystems, and two TA78 magnetic tape subsystems.

An Ethernet local area network links more than 300 active users of the system. The VAX/VMS operating system and DECnet software complete the foundation.

Digital's VT240 or VT241 video terminals provide access to the system for both the scientific and non-technical staff. For those whose jobs focus on word processing, the DECmate II and III word processor is the standard system. Users requiring access to applications such as computer-aided design (CAD) and chip layout use specialized terminals provided by third-party vendors.

In order to provide total integration and added computational power, the Microelectronics Center employs Digital's SNA Gateway to gain access to McDonnell Douglas's IBM® mainframes.

At the St. Louis facility, a VAX-11/730 minicomputer, connected to the cluster, is dedicated to a system for monitoring the building.

Twenty-five users at the Huntington Beach microelectronics facility access the network with a statistical multiplexer connection. A VAX 8600 and a VAX-11/780 minicomputer are slated for installation at this facility.

Get it right the first time

The opportunity to build the Microelectronics Center around the latest generation of computer hardware and software allowed McDonnell Douglas to do it right the first time.

"We wanted to employ a system which would minimize the cultural shock..."

"We wanted to deal with the cultural change which has come about in the business environment as a result of office and information automation," Browde said. "Particularly, we wanted to deal with everyone's tendency to rely on paper.

"Before the advent of office automation, a secretary would type something, make copies, and distribute it. Nine out of ten times each piece of paper got filed. More often than not, it was something that should have been thrown away. It had a defined, short, useful life but it stayed in a file forever. We knew we could save money by eliminating that sort of thing," he said.

"We also wanted to move away from the idea that having a secretary was a status symbol. We organized as work groups with shared clerical resources. And we wanted to be sure to employ a system which would minimize the cultural shock which can come with major changes like the new generation of computerized office systems," Browde added.

The result is a sophisticated office automation system built around the ALL-IN-1 system, customized around a specification generated by the center's



The McDonnell Douglas Microelectronics Center in St. Louis, Missouri.

administrative support staff called "COIN" (Central Office Information Network). It links all functions to provide word processing, electronic mail, telephone messaging, spreadsheet analysis, and more. No more than two persons share a terminal, and it is the favored communication tool by the whole organization.

"No one had something as user friendly as the ALL-IN-1 package."

The Microelectronics Center also required the latest technology in scientific computer applications, simulation, statistical analysis, computer-aided design, and computer-aided manufacturing (CAM).

"We needed the ability to run integrated circuit simulation, and the scientific community obviously needed some personal computer power," Browde said. "No modern laboratory can function without microcomputers."

In addition to the scientific computational capability, Browde wanted to give personnel at the Center the ability to communicate, to transmit files from location to location and also to access financial and managerial software. Effective word processing and messaging systems were vitally important to reduce secretarial workload.

"Of course, we also demanded reliability," he said. "You can't have a system down if you literally have your whole operation totally dependent on a complex computer network.

"Most of all, we wanted integration. We wanted a *system!* We wanted a network of minicomputers, compatible terminals, and microcomputers that could talk to each other."

Opting for integration

No single computer manufacturer had the hardware and software necessary to meet all of McDonnell Douglas's requirements, Browde said. However, Digital came much closer to meeting the firm's needs than any other vendor.

The desire for total system integration with a strong scientific computational base—available from Digital— meant rejecting some exciting packages available from other vendors, Browde said.

"But no one had the integrated systems approach of Digital Equipment Corporation, and no one had something as user friendly as the ALL-IN-1 package. And most of the microelectronics CAD/CAM and circuit simulation software we wanted was written to run on the VAX minicomputers," he said.

"Software will evolve, and if we really need something badly that we can't buy, we'll write it ourselves," Browde said, "but only as a last resort.

"In my opinion, if you buy incompatible hardware, incompatible operating systems and protocols, you'll be stuck with a white elephant before you have gotten back your investment," Browde said.

"When you have the opportunity to build a system from the ground up, it simply doesn't make sense to build it out of incompatible pieces. That would be like wiring one-half of the building with 50 cycles electricity and the other half with 60 cycles. They'd both work, but they're incompatible!"

Clean environment

Browde is satisfied that the system meets or exceeds expectations, and, most importantly, that it provides the expected productivity increases which translate into cost savings.

"We've built this organization with 30 per cent lower clerical costs than we would have had in a conventional office," Browde said.

"And many of the things we do here we couldn't even attempt if they were done the old way. Developing microcircuitry without current computer-aided design and simulation packages is impossible," he said, "and when you add the other computational functions, you can be in mortal danger of having three terminals on everyone's desk, each connected to a different system, and that's a nightmare."

The integration of scientific, office, and process computation also facilitates maintenance of the manufacturing and research facilities in an ultraclean condition. Almost 50,000 cubic feet of the St. Louis facility is clean space. More than half of that is designated class 100; no more than 100 particles of .4 microns are registered per cubic foot of air. By comparison, a clean office has about 1,000,000 particles per cubic foot.

"We're trying to get our process control electronically instead of on paper. Paper is dirty. Terminals in the clean space not only eliminate paper but also the need for many of the trips in and out of the clean rooms," Browde said.

Executive applications

The ALL-IN-1 system also provides executives like Browde with the tools they need to perform management duties effectively.

"It has increased my communications capabilities several times over," Browde said. "If I want information from someone, I simply draft a quick electronic message and send it. Within hours, I'll likely have an answer. In the past, it might have taken days just to make contact with someone," Browde said.

"I also find my terminal at home useful. It's another valuable link with the plant in St. Louis and with Huntington Beach, especially when I see the time differential.

"It allows Huntington Beach to get on the system at the end of their day. I read the message at night and answer it. The next morning I have data and they have some action items," he said.

"But primarily, the system gives me access to the information I need to do my job. Whether it's fiscal data from the IBM mainframes or research and manufacturing data from VAXes in the center, it's at my fingertips," Browde said.

The Microelectronics Center personnel continue to expand the system's capability and the user base.

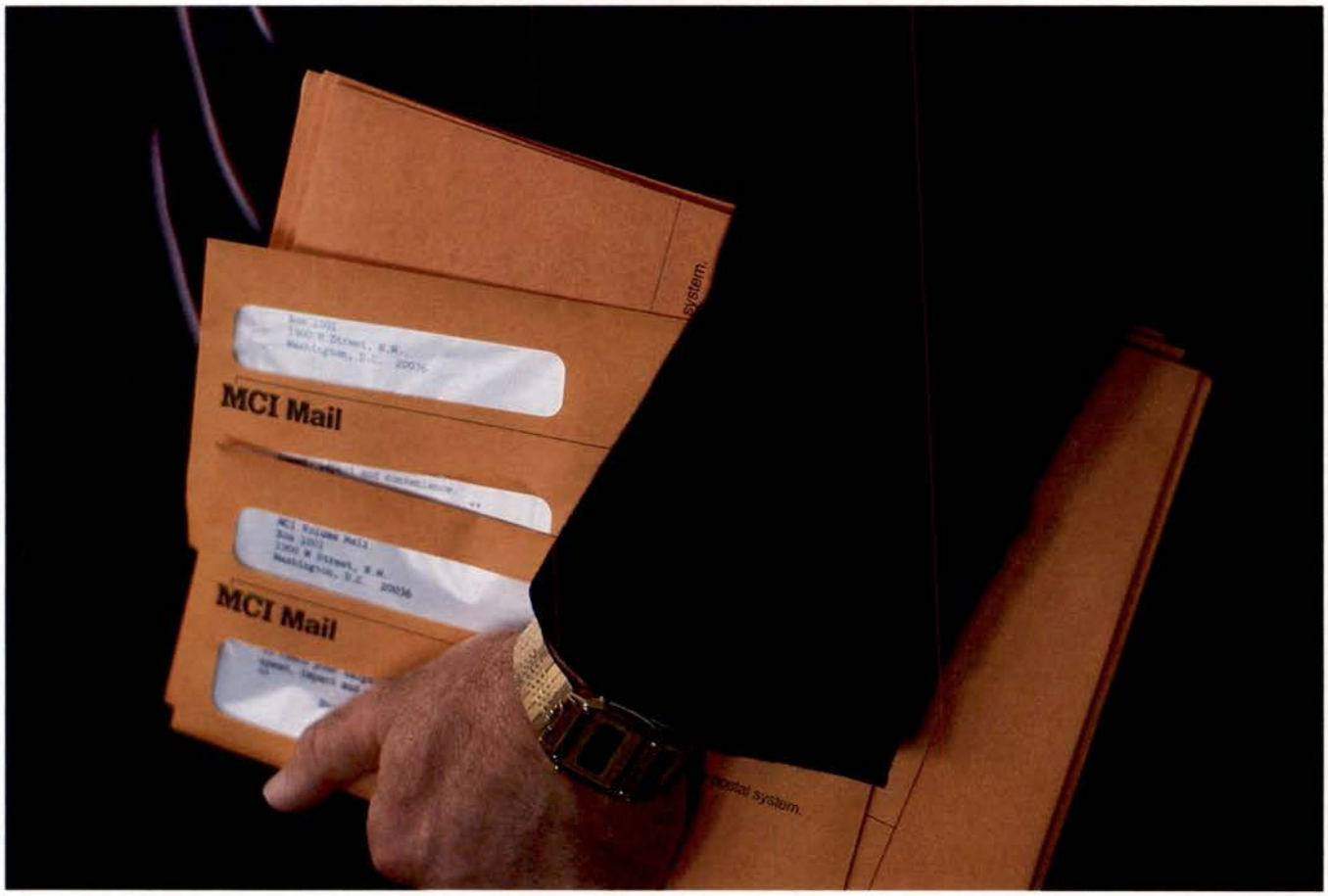
"We'd literally like to get rid of all the paper here," Browde said. "We are currently developing a forms approval system. Items like travel requests, cash vouchers, and expense reports could be developed at the terminal and transmitted by ALL-IN-1. Once we have a way of assuring proper security and sign-off authority, I think we will have stripped away another layer of office paper." ■

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"An impressive effort in a short period of time"

MCI Communications launches mail network with Digital's Software Services

By Gloria Bates



It's late evening. The marketing manager of a New York-based company switches on his modem, picks up his telephone, and dials a local number. After pressing the return key on his personal computer, he enters his name and password, and chooses the CREATE selection in the menu display. He types in the name of the company's San Francisco, California, sales manager and completes a letter to her.

After he keys in a command to send, the message moves across the country via a packet-switched microwave network. Within minutes, the sales manager logs into her computer and reads her letter. Another MCI™ Mail communication has been completed.

MCI Mail, as this example suggests, is a sophisticated electronic message delivery network. It represents the latest innovation from MCI Communications Corporation, which first offered long distance telephone service it at significantly lower costs than had ever been available.

How MCI Mail Began

In September, 1983, MCI publicly launched MCI Mail service in the United States. Only nine months earlier, the network was still on the drawing board, little more than a bold vision within the company. It was nurtured by J. Robert Harcharik and Vinton Cerf, respectively the president and vice president of engineering at MCI Digital Information Services Corporation (MCI DISC).

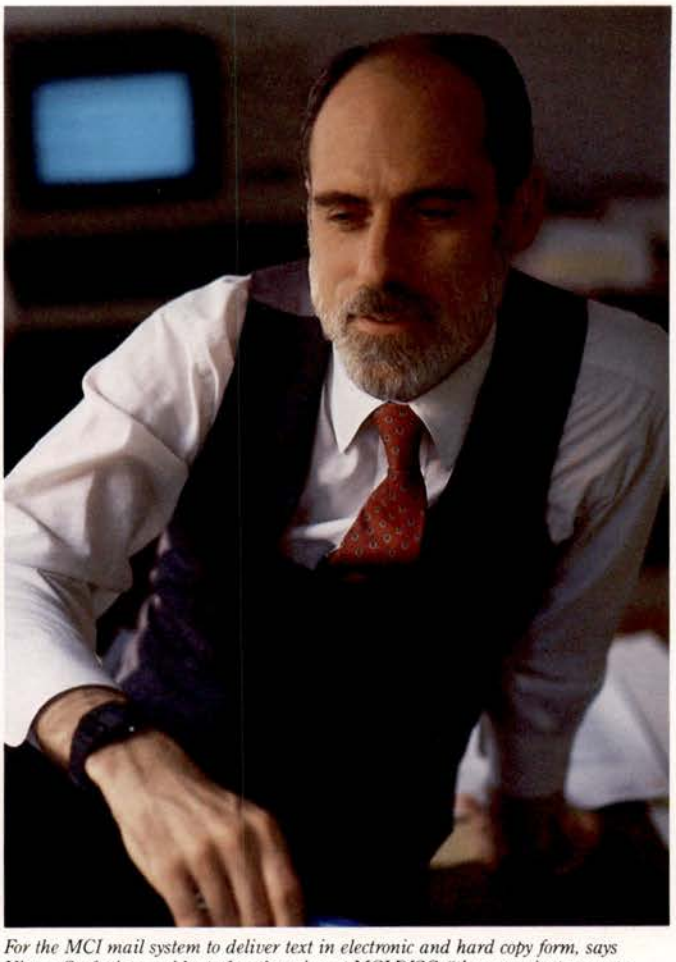
Harcharik sought "to create an electronic message delivery system to handle millions of users."

Cerf desired a system that could serve a broad range of current as well as future needs. "If we could handle electronic mail delivery and, at the same time, enable people with proper equipment to send mail to those without, through hard copy delivery, we realized we could serve a much larger community of users."

The story of how MCI Mail moved from



J. Robert Harcharik, president of engineering at MCI Digital Information Services Corporation: MCI chose Digital because of system compatibility and expertise in software design and installation.



For the MCI mail system to deliver text in electronic and hard copy form, says Vinton Cerf, vice president of engineering at MCI DISC, "there was instrumentation beyond belief. It sounded like preparations for a shuttle countdown."

the planning stage to the marketplace represents a unique combination of MCI's corporate leadership and Digital Equipment Corporation's technical expertise in designing and installing software that was compatible with its mainframes and responsive to the customer's needs.

Digital Begins Working

MCI had considered several companies to assist it in developing this project. Digital was selected as a major contractor because of its computers and its ability to provide reliable custom software within a a very tight deadline. "We chose Digital because it had the highest point of departure to solve the problem," said Harcharik.

Less than a week after MCI approved Digital's proposal in December, 1982, a team of software specialists in Digital's Landover, Maryland, office began developing two major parts of the project: the electronic mail component and the component that produces output to hard copy printers.

The team created a message transport system that moves any type of text or graphics within a set of VAX-11/780 computers that are linked by Digital's DECnet, PSI (packet switching interface), and Message Router software. These computers store all messages on shadow disks.

The integrated design of the message transport system and routines are akin to the hub and spokes of a wheel. The Digital team created substantial flexibility so that additional routines could be added over time. When Digital introduced DECtalk, for instance, software specialists were quickly able to create software that connected this text-to-speech terminal device to the message transport system.

In addition to the work conducted by the Landover team, two other Digital field offices became involved with related aspects of the MCI Mail project. The Chicago, Illinois, office undertook the critical task of installing the software on the VAXcluster systems at MCI Mail's central data processing facility in Naperville, Illinois.

Digital was selected because of its computers and ability to provide reliable custom software within a very tight deadline.

The Philadelphia, Pennsylvania, office worked under a separate contract with MCI International, another subsidiary, to enable the network to communicate worldwide through conventional telex terminals.

Meeting Deadlines

All three Digital groups understood the importance of meeting their deadlines. "Digital had a big job to do," recalled Cerf, "because so much of the system depends on services that are part of the VAX complex." By early July, "the software team had put a prototype system together and had it ready to demonstrate to MCI's upper management."

From July to September, 1983, when the public announcement was scheduled, the intense pace continued. The Digital team in Landover, for example, continued to develop new capabilities for the system and refined many operational aspects.

"The weekend before the announcement," noted Cerf, "we worked our way through the system, tracking test messages through it. There was instrumentation beyond belief. It sounded like preparations for a shuttle countdown. We tested the software and it all worked."

Within nine months, Digital Software Services personnel had completed nearly 30 man-years of software development. By November 1, the Philadelphia-based Digital project team completed the international telex component of MCI Mail, again within the time frame MCI had established.

Harcharik characterized the activities of the Digital project team he collaborated with as "an impressive effort in a short period of time.

"From a technical standpoint," he said, "the quality is substantially higher than I would ever expect to find in the field. I don't think anyone could do a better job on a project like this."

Although the story of MCI Mail ends here, it continues every time someone like that New York-based marketing manager wants to send a message to his company's sales manager in San Francisco. Both are probably unaware of what was necessary to make that communication happen, yet are grateful that the MCI Mail services is now in place. ■

MCI is a trademark of MCI Communications Corporation.

In New South Wales,
37 VAXes for health administration

Department of Health charts "economic, efficient, and manageable" information system

By David S. Locke
InterOffice Staff Writer



Meeting the public health needs of more than four million residents of New South Wales, Australia's most populous state, has required the development of extensive computing capabilities throughout the state's Department of Health.

A series of administrative reorganizations which culminated in 1982 molded the



"We chose a plan which is hospital-based with central support services. We can install networking capabilities when it becomes appropriate to do so," says Richard Dixon Hughes, manager of the computer division.

current department from several predecessor organizations. Its administrative responsibilities include more than 300 hospitals, psychiatric facilities, alcohol and drug abuse treatment centers, a range of public health services, community health centers, ambulance services, and maintenance of a license registry for more than 120,000 professionals.

Formed in 1979, the Computer Division plans, coordinates, installs, and manages information processing technology in all areas in which the department holds administrative responsibility. In addition, the division maintains the central computing facility which handles administrative functions for the department.

"The division has several related objectives," said Richard Dixon Hughes, manager of the computer divison. "Economy and cost containment is one. Improved patient care is another. We intend to improve the availability and quality of management information with a computing system that is economic, efficient, and manageable."

The department recently ordered its 37th VAX computer from Digital Equipment Corporation. The majority of installed computers service hospitals throughout New South Wales. A VAXcluster system including a VAX-11/780 and a VAX-11/785, with a VAX 8600 computer on order, forms the core of the division's central computing facility in Sydney.

Until the 1960s, state-administered health services in New South Wales were the responsibility of several different agencies. The agencies, in their turn, were directly responsible to a medley of different institutions, boards, and officers.

Beginning in 1962, a series of reorganizations brought together the multiple health care services which the state Department of Health now administers. In the course of reorganizations, the department acquired administrative responsibility for more than 12,000 employees.

"The VAX/VMS combination is very well accepted in the commerical market and gives us access to a variety of application packages."

Most of the residents of New South Wales served by the department live in the urban centers of Sydney, Newcastle, and Wollongong along the coast, but the population dispersed throughout the interior portions of the state also require hospital and community health centers and ambulance services. The affiliation of a number of large hospitals with the medical facilities of the state's universities further enlarges the scope of the department's responsibilities.

Information and data handling needs that arise in a health services environment are challenging for several reasons. They are diverse, spanning areas which include clinical needs, patient administration, finance and accounting, inventory (purchasing and supplies), personnel records, records for community health centers, and professional license registries.

The scope of these services is complicated by layered needs within areas. Health insurance payments for patients may come in as many forms as there are insurance plans. Payments typically come at irregular intervals, and the nature of coverage varies from plan to plan.

Enlarged responsibilities for the Department of Health is just one more of the forces pushing costs skywards. "Health care costs had become a matter of considerable concern," said Dixon Hughes. "Governments everywhere face explosively rising costs in all health care delivery systems. Our ability to deliver quality health care depends in part on how well we contain those costs."



Maxwell Howle, deputy manager of the computer division: "Part of the challenge of the job is in the multiple levels of accountability. From the ministerial level through health care providers to the customers, we have to satisfy many groups."

Several analyses of the department's functions, beginning in the late 1960s, had confirmed a need for information processing. Finally, in late 1982, a "Forward Plan for the Introduction of Computing" was completed. Officials at the Ministry of Health approved full implementation of the plan in May, 1983.

Centralized computing facilities were rejected as inappropriate to the population and hospital distributions throughout the state. Strict regional plans seemed inadvisable for the same reasons.

"We rely on extensive user advice to help us chart changes in both software and documentation."

"A very high percentage of data generated in a health facility stays in that facility," said Dixon Hughes. "We chose a plan which is hospital-based with central support services. We can install networking capabilities when it becomes appropriate to do so."

The plan was put out to tender, a process functionally equivalent to publishing a request for proposals. After a lengthy selection process, Digital was chosen to supply minicomputers, workstations, and terminals to the central computing facility and to the medium and large hospitals above 120-bed capacity.

"Price and technical considerations were among the strategic considerations," said Dixon Hughes. "Equally important, the VAX/VMS combination is very well accepted in the commercial market and gives us access to a variety of application packages. And the portability of software across a range of hardware was very important in our decision to work with Digital."

A contract executed between the Department of Health and Digital allowed individual hospitals to purchase units without having to go to bid each time an order was placed. Total computer purchases over the next five years should represent an investment of more than $9 million.

Information handling software systems are now being made uniform throughout the hospital system of the department. Software packages include a mix of those written by department staff, those purchased from outside vendors, and those purchased and modified to suit institutional needs.

The Hospital Patient Administration System (HOSPAS), the central core package, is designed to run on Digital's VAX computers. It includes three systems: the Patient Master Index, the Disease Index, and a package for Admissions, Transfers, and Separations.

Other packages either in use or in advanced stages of development include HOSBIL, for patient billing and receivables; HOSFIN, to handle finances, general accounting, inventory, supplies, and purchasing; HOSOPS, for records and management of outpatients; and HOSPAY, a payroll system.

"The software is alive and growing," said Maxwell Howle, deputy manager of the computer division. "The important aspect of its design is that it does not develop in a vacuum. We rely on extensive user advice to help us chart changes in both software and documentation."

"Medical and clinical staff are constantly finding new needs."

As deputy manager, Howle also directs the field implementation and training group, which is responsible for training and guidance of hospital personnel for new applications.

"Part of the challenge of the job is in the multiple levels of accountability," Howle said. "From the ministerial level through health care providers to the customers, we have to satisfy many groups."

Within the Computer Division, the Consulting and Specialist Support Branch (CASS) handles incoming requests, evaluates software, and consults with various groups on matters of system evaluation and performance. Geoff Deacon, assistant manager, described consulting with potential users as a process of asking, *How does it fit?*

"People come to us and say they need a computer," Deacon said. "But that's only the beginning. We have to go behind the surface request to find out what the information need is, and see how it fits with other needs, current and anticipated."



Geoff Deacon, assistant manager of the computer division's consulting and specialist support branch.



Ziz Francuz, senior systems officer with the computer division's consulting and specialist support branch, discusses system configuration with Wayne Plant, (right) Digital account representative.

Another service which Deacon's branch provides, after needs have been assessed, is configuration of the computer system. Ziz Francuz, senior systems officer with the branch, said the whole process from request to installation and performance evaluation is shortened by having most of the operations performed in one area, by people accustomed to the choices available.

"We are packaging cost-effective solutions for the hospitals who want to join the Forward Plan," he said.

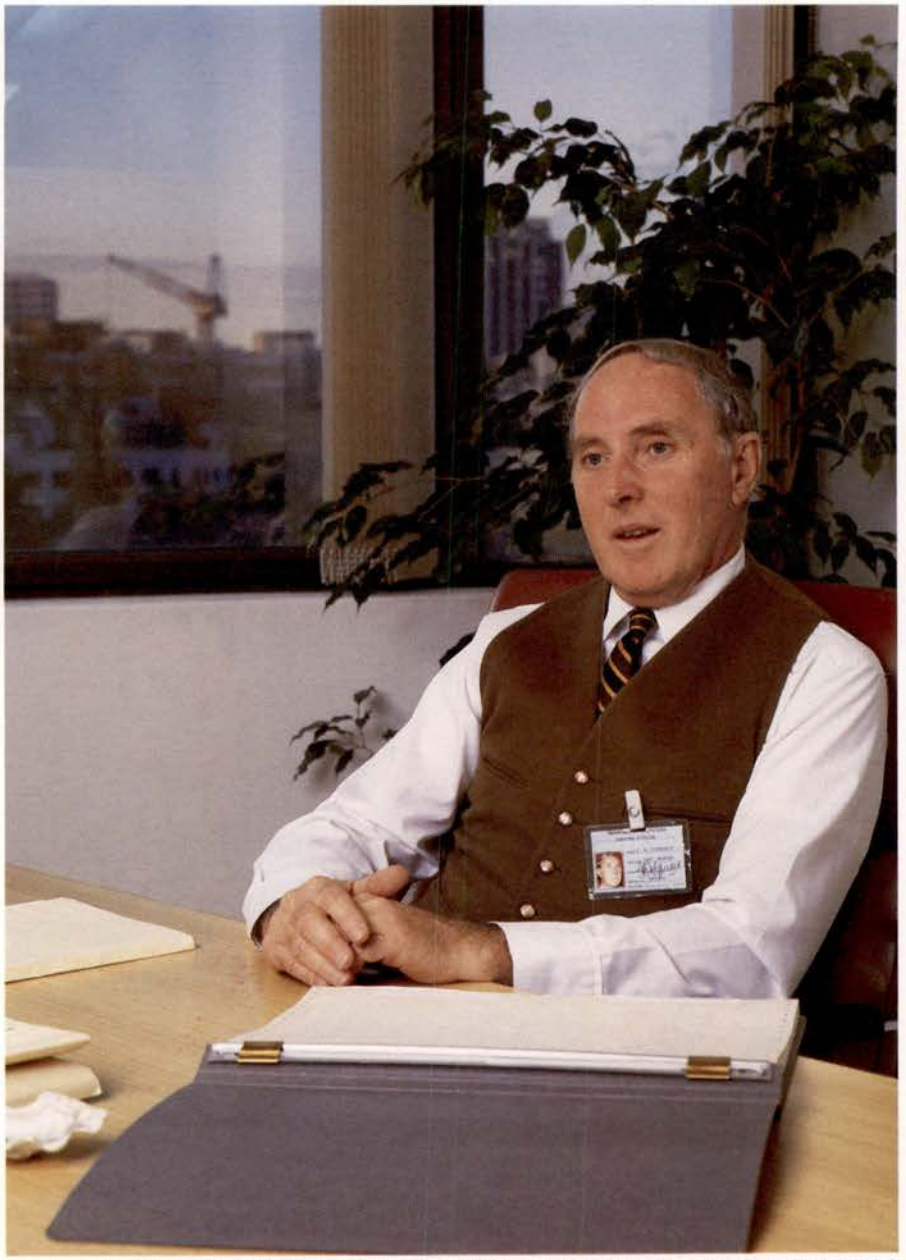
"We can grow stage by stage with Digital, as our need grows."

According to Francuz, responsibilities are shifting as expectations change. Onsite evaluations are moving from hardware to software, he said, as evaluation asks not just if the lights came on, but whether the software runs as intended.

New needs and new applications appear constantly within the multiple agencies that make up the New South Wales Department of Health. The General Applications and Programming Branch, which develops and maintains applications programs with the Information Systems Branch, is the source of specialized applications for clinical areas throughout the hospital system.

"Medical and clinical staff are constantly finding new needs," said Barry Fitzgerald, assistant manager in charge of the branch. "We've developed HOSLAB, which includes systems for biochemistry, hematology, and microbiology. They are just the core of HOSLAB. However, there's room for expansion."

Specialized applications developed by the branch range from a cancer registry to a linen control system, Fitzgerald said. One of the most important applications now being developed is the Computer Assisted Despatch System for Ambulance Vehicles.



According to Barry Fitzgerald, assistant manager of the general applications and programming branch, specialized applications developed by the branch range from a cancer registry to a linen control system.

The system is currently under pilot study at the New England Regional control center at Tamworth in central New South Wales. It is designed to capture information quickly and locate the nearest available vehicles to reduce response time in emergencies. In addition, the system will allow for data transmission to and from mobile units.

"For development and application we are pleased with Digital," Fitzgerald said. "They offer us a good family of compatible products, right up the line. We don't have to jump up and down to get service. And we're certain they'll be around tomorrow."

While Dixon Hughes is pleased with the implementation of the Forward Plan, he also anticipates a quantum growth in demands placed on information systems in the hospitals and in the department's central computing facility.

"We are happy to have had a contract with Digital during our formative period," he said. "Their range of computing power and the compatibility of their systems have been crucial to us. We can grow stage by stage with Digital, as our need grows." ■



Hughes: pleased with implementation of the Forward Plan.

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The DIGITAL Leader

The magazine for and about DIGITAL's worldwide management team Q2 1998

Q. How do you get your people to take risks?

A. I tell them to—and then I support them.

Tom Siekman
DIGITAL Senior Vice President and General Counsel

Priority One



Customers are our first priority. The employees and partners who support them come next–Leadership Principle #1.

You have been hearing and reading about this principle during the past few months for a very good reason: nothing is more important to our growth than making customers our first priority.

It is a high standard, one that many companies talk about and far fewer actually achieve. But if we live up to this standard, everything else–from product quality to business practices–will fall into place, because every decision we make will be based on how well it serves customers. We will energize both our customers and our employees.

Putting customers first is not as simple as it sounds. It requires not only a change in approach but also a change in attitude. At DIGITAL, for example, we have sometimes had a tendency to believe that we know what is right for the customer. That kind of attitude puts the customer, at best, in second place.

We have also been very focused on internal issues–first, getting our financial house in order and then developing a growth strategy for the future. These were things we had to do, but one result was that we did not spend as much time as we would like building our customer relationships.

Now that we are turning our focus to revenue growth, we must make customers our first priority. And the best way to do that is for each of us, as DIGITAL leaders, to make two personal commitments: first, to spend more time with customers, and second, to do whatever it takes to support our sales and service professionals.

There is no substitute for meeting our customers face-to-face–in their office, at our Corporate Customer Center, at a trade show, or wherever we need to be. And we must do it at every level of the customer decision chain, from the department level to the CIO and CEO. This is the only way we will get to know their business, understand their needs and build long-term relationships. As a result, we will generate new business opportunities, and we will learn about customer concerns before they become problems. We will also help our customers get to know DIGITAL, who we are and how we can help make them more competitive.

This is a process that must start at the top of the company. To that end, each member of the Executive Committee has made a commitment to increase the amount of time he or she spends with customers and to provide more support for the sales team. I take that commitment very seriously. During Q2, I increased my customer visits by 30 percent over the same period last year. So far this fiscal year I have met or talked with more than 160 customers.

This is one of the most interesting and rewarding parts of my job. Whether I spend 15 minutes or two hours with a customer, I always come away with new information and new perspective. I not only have a better understanding of the challenges they face, I also have a better understanding of DIGITAL, our strengths and the areas where we need to improve.

The purpose of these meetings is to support the efforts of our account managers and other sales professionals. They are in contact with customers every day, and they are in the best position to identify opportunities for growth. We want to make it as easy as possible for them to get the help they need from senior managers.

Whether we deal with customers on a daily basis or only on occasion, we each share responsibility for making customers our first priority. If you are a participant in the Executive Partner program, make sure you do everything you can to support your customers and DIGITAL's account manager. Even if you never see a customer, remember that virtually every business decision you make ultimately has an impact on our relationships with customers.

But our roles as DIGITAL leaders demand even more. We also must create an environment in which all employees recognize that customers come first. If we do, we will achieve our goals of increasing profitability and growth. ❍

–Bob Palmer,
Chairman

The DIGITAL Leader

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Go beyond the boundaries, **take some risks** 2

DIGITAL General Counsel Tom Siekman inspires his team of lawyers to do more than provide legal help and that's just what they do. Intel is just one example.

Are DIGITAL's **Alliances working?** 6

Judge for yourself. One thing is certain, companies that profit from their alliances have a better chance for success. DIGITAL intends to be one of them.





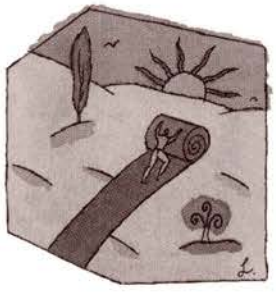
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Sometimes listening to the customer means listening to the right customer. Sometimes it means asking the right question. Lessons from the real world.

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The customer comes first. To make it happen, try turning your organization chart upside-down. "Every message we communicate...is linked to the customer."

–Genevieve Houdent





"Where'd you get **my name?**" 16

The DIGITAL Leader set about asking non-managers at DIGITAL what they thought managers were doing right, what they could be doing better. We thought it would make an interesting survey. We were right.

DEPARTMENTS

Palmer on..."Priority #1." **INSIDE FRONT COVER**

Letters to the Editor: A few thoughts on "Can DIGITAL Change Its Culture?" **BACK COVER**

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"Go beyond *the boundaries,* *take* some risks"

In Brief: The man who led DIGITAL's legal team in the Company's short but highly publicized patent infringement battle with Intel believes in doing more than responding to questions about legal compliance. He expects–and demands–that the Company's legal team, both the general attorneys and the Intellectual Property lawyers, step forward to help the Company solve its problems, whether business or legal. It's not the easiest way to run a law department, but the results speak for themselves.

After growing up in what are euphemistically called the "competitive" neighborhoods of Somerville, Massachusetts, in the 1950s, DIGITAL Senior Vice President and General Counsel Tom Siekman took his hard-earned degrees in engineering and law (Merrimack College and Villanova Law School) and went to work in 1966 as a patent attorney for the Bethlehem Steel Company in Pennsylvania. As the newest employee of their legal department, he was handed jurisdiction over an emerging practice there that no one knew anything about–computers. Later, after a three-year stint with Mohawk Data Systems, a technology highflier in its day, he landed a job with a Boston law firm and took on his first heavy-duty patent litigation. His task was to defend a company that was, allegedly, infringing upon a patent for computer core memory–a device developed at the Massachusetts Institute of Technology. On the other side of the courtroom sat the two computer pioneers who invented the device in question: Jay Forrester and Ken Olsen. Because the case was settled out of court, Siekman would never know how the judge might have ruled. But in 1973 he was offered a job with DIGITAL Equipment Corporation as its first patent lawyer. Shortly after starting his career at DIGITAL, company founder Ken Olsen called him into his office and told him that all his theories in defense of his client in that core memory case were wrong. In 1980, Siekman moved from patent to general law. He has been the Company's General Counsel for the past four years.

DIGITAL Leader: How does DIGITAL's law department differ from those in comparable companies?

Tom Siekman: Law departments do three things: provide legal advice; handle legal matters, such as negotiating contracts, that sort of thing; and they provide counsel. Lawyers right out of law school should know the law, and they can, therefore, provide legal advice. After gaining some experience and maturity, a lawyer will be able to handle legal matters, such as drafting contracts and handling negotiations. The last thing, in the order of maturity, is to develop the ability to help a client solve a problem. This is what counseling is, helping a client–one of our business managers–solve a problem.

Another way of looking at it is to say a legal department makes sure a company is in legal compliance, and it provides service in the form of helping to solve problems. This means we make sure people don't do the wrong thing, and we make sure systems are in place to make sure people comply with the law. At DIGITAL, we consider that a fundamental assumption, a foundation for going forward. We do compliance, but we go beyond compliance. Lawyers, by their training have good analytical skills, are good communicators, good debaters, and they know how to make decisions. These skills are often more important than knowledge. And we use these skills to help our clients solve problems.

DL: Such as?

Siekman: Well, here's one example. A business manager may come to us and say he or she would like to patent something. During the dialogue with the DIGITAL lawyer, it becomes clear that what is needed is not a patent, but a copyright or a special contract. Through this dialogue we try to help the company define the right problem and then find a solution.

DL: So the 75 or so lawyers working at DIGITAL are more senior than most?

Siekman: That's right. But not necessarily more experienced. Our practice is more mature. The Intellectual Property Group, about 15 of whom came from DIGITAL's engineering ranks, tend to be somewhat less experienced in the law than what you find in other companies. And our general lawyers tend to be more experienced than the average. But the real question is what is the maturity of the practice here. If you go back to the construct of legal advice, handling legal matters and counseling, there are people who can mature through that process in as little as three to five years. Then there are some who won't get there after 20 years, who will only respond when asked. In a very real sense, that's what people in law firms do. They respond when someone calls. They don't go out and look for ways to solve people's problems. They provide advice when asked, or they handle legal matters when asked. People inside companies, such as DIGITAL, have to understand the clients' issues and objectives much better. That's why you're more likely to get counseling from an in-house lawyer. Our Intellectual Property lawyers, for example, rapidly become true counselors once they join the Law Department.

DL: How do you make this happen, this pro-active counseling?

Siekman: I tell them I want them to counsel. I tell them to go beyond the boundaries, to take risks. I tell them to ask questions. And when they get a response from a business manager that doesn't sound quite right, ask why. Find out what the business manager really wants to do or should do.

DL: Can you give us an example of pushing the boundaries here at DIGITAL?

Siekman: Sure. Back when we were more oriented to discrete business units, DIGITAL had all kinds of contracts that our



SYLVIA STAGG-GIULIANO

customers needed to deal with. We had different contracts for different business units. So the lawyers forced contract consolidation across the company. Today, even though the Company's current, more integrated organization is fairly new, DIGITAL contracts are basically consistent across the board.

DL: And this is something a DIGITAL business manager should have done?

Siekman: Normally, yes. But the

"The Intel suit provided many challenges for the lawyers. But one of the primary challenges was minimizing the disruption the suit caused the Company. This meant providing employees with as much information as we could so they could answer the questions they had to face on a daily basis from customers, from their neighbors and from their families. The problem was being able to do that without jeopardizing our legal case. We learned it was far better to admit there were some things we just could not talk about than it was to just stop communicating altogether."

–Joe Nevins, Asst. General Counsel

Company wasn't organized at that time to provide that sort of cross-business-unit coordination. The lawyers were organized to see things that way and so were able to help.

DL: And how do you think DIGITAL business managers view the law department?

Siekman: Depends on how the lawyer in question is doing. It's an attitude. If we have a lawyer who thinks, 'I'm a lawyer, I have great analytical and communication skills. I'm smart and you need my help. I'm going to counsel you whether you like it or not.' That's not counseling. That vitiates the very concept of counseling. Counseling starts with an empathy. I'm here to help. Counseling is a very supportive dialogue approach. Tell me your problem, and I'll help you solve it. As a result, the relationship between the lawyers and the business managers in DIGITAL for the most part is just superb. Business managers want more support, not less. My job is also to make sure the system is cost effective. So I'm the one saying 'Don't hire more lawyers. We have enough.'

DL: Tell us about the Intel case. What happened?

Siekman: Basically, it starts with the fact that DIGITAL has always been a leader in technology. We've pushed the boundaries of various kinds of technology, and this goes back to the VAX and PDP-11. Building upon all that, the company has established a very powerful, very good portfolio of patents. Many companies have a lot more patents than we do. But there are good patents and junk patents. We went through our patents some time ago and got rid of about 50 percent of them. You know you keep a patent by paying fairly high taxes on it every year. Today, pound for pound, patent for patent, we have the best portfolio in the industry in microprocessor, system and software patents.

DL: That's a pretty bold statement.

Siekman: Let me explain. Say a company comes to us and tells us they have, say, 28,000 patents, and they are sure that we are probably using some of their patents, so they demand one percent of our annual revenue. We'll say to them, 'That's great that you've got 28,000 patents, but we don't care about any of those patents unless we're really using some of them. But it's up to you to plow through all your 28,000 patents and show us which ones are relevant to DIGITAL's products.' Well, by culling our patents down to just the high-quality ones, we already know where we stand. It's like playing five card stud poker. We've already gotten rid of our weak cards. And now we know that our cards are better than the other person's.

DL: And in the Intel case?

Siekman: When the Intel Pentium Pro came out we noticed similarities. That is, our engineers, who follow these things carefully, brought it to our attention. Infringement is a legal determination, though. You have to examine the physical evidence, and then you have to look at the words in the patent. The key decision on infringement is up to a lawyer.

About the same time we thought that Intel might have infringed some of our patents, they approached us about cross-licensing some of our patents.

Bob Palmer came into my office and suggested we conduct a full investigation. So we retained Fish & Neave, a New York firm specializing in patent law, and the services of Herbert Schwartz, the well-known patent lawyer who won Polaroid's case against Kodak. Along with our in-house team of DIGITAL patent lawyers, engineers and outside consultants on technology, we worked about six to nine months before going to the DIGITAL Board. We made an oral presentation to the Board, under attorney-client privilege, and they supported our going ahead. In the process we added the basic Pentium processor, and the Pentium II, which was introduced just before we filed the lawsuit.

DL: The press, at the time, said that DIGITAL is not a very litigious company. Is that true, and if so, why?

Siekman: We've had patent battles before. In the late 70s, for example, when people copied the PDP-11. But in general, DIGITAL traditionally goes out of its way to resolve issues without litigation.

DL: Were there any surprises in the Intel case?

Siekman: Yes. I didn't expect that Intel and DIGITAL would talk as early as they did. That surprised me, the timing.

But beyond all that, the important thing was that senior management from both companies decided that this could be a win-win situation, as far as negotiations were concerned.

Going forward, I think it's important to understand that DIGITAL and Intel have had a close relationship over the years and that, with the litigation now concluded, this relationship will be even closer under the settlement agreement. This really was a win-win situation for both companies.

DL: What did you learn from the Intel experience that you didn't know before?

Siekman: That's a very good question. I was even more impressed than before with the quality of the internal DIGITAL lawyers. Jim Shaughnessy (Asst. Gen. Counsel) was my co-captain for litigation. We, together, led the legal team. The difference was that I led on behalf of the company. So it was my job to make sure the business ramifications were coordinated into the strategy for the litigation. But for the legal effort, Jim and I were co-captains. Dan Bernstein (VP & Asst. Gen. Counsel), among the many things he did was ask the hardest questions. Art Fisher (Asst. Gen. Counsel) handled the intellectual property law. Molly Brennan (VP & Asst. Gen. Counsel) drove the main part of the settlement. And Joe Nevins (Asst. Gen. Counsel) coordinated and drove the critical communications strategy and coordinated the lawsuit with the people in the company responsible for our Intel-based business. Many others in the Law Department played significant roles from time to time.

DL: I know from talking with others that this was a seven-days-a-week, all kinds of late hours effort from beginning to end. How did it all go with your family?

Siekman: Well, I have a son who's an intellectual property lawyer with a Washington, D.C. law firm and another son who works at Coopers & Lybrand. The patent attorney understood the case very well from the legal point of view, my other son understood very well the business ramifications. My wife Claire and my daughter, who's a teacher, gave me a lot of moral support. They were pretty involved because of all the media attention surrounding the case. There was enough public information in the media to create very lively dialogue. In the heat of the case our conversations sounded like the lively discussions we used to have about the Boston Bruins (professional hockey team).

DL: How much did the case cost DIGITAL?

Siekman: About $10 million.

DL: That's peanuts for a case this big.

Siekman: That is peanuts. This was a well-controlled, command and control operation. You know we tend to believe that DIGITAL is too loose an organization, that people do whatever they want. But that's probably not the right image of DIGITAL today. This was a controlled and disciplined effort. ❍

–CHB

"Representatives from different groups within DIGITAL worked very closely together on this project. In this sense the project reflected a basic truth about the company–it can only function effectively as an integrated whole. Teams were formed to address a variety of issues. The people on these teams came from sales and marketing, the products division, public relations, finance and law. There was a diversity of viewpoints, a good deal of creativity, a common objective–that's what made the experience productive and rewarding, personally, for those involved."

–Dan Bernstein, VP & Asst. General Counsel

Are DIGITAL's Alliances Working?

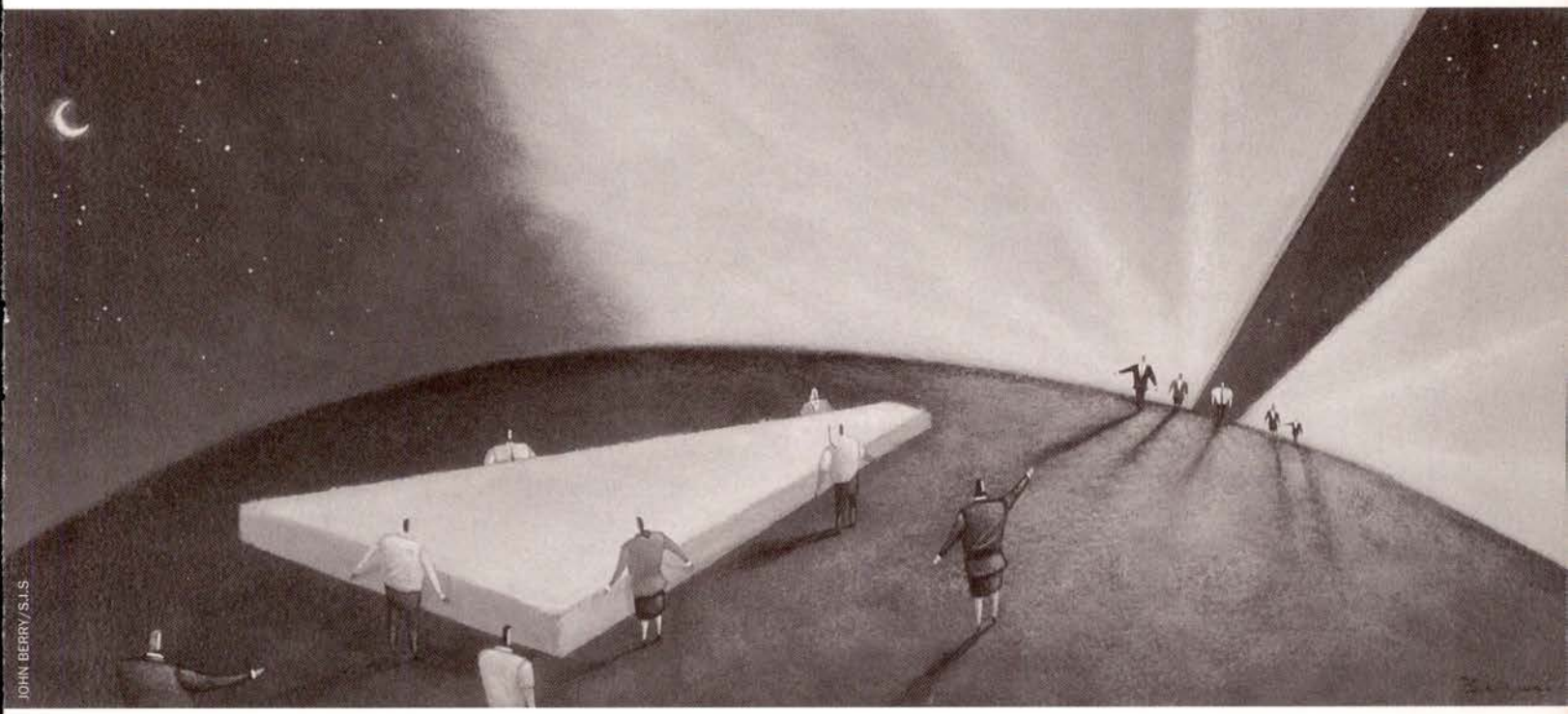
In Brief: A look at the how, why and what of DIGITAL's growing alliances, including where they are and they aren't working. One thing is clear: the way the world is going, some companies are going to be successful because of their alliances. DIGITAL intends to be one of them.

The qualities that made DIGITAL a force in marketing the minicomputer–peer-to-peer computing, modular system architectures, networking, and out-of-the-box thinking–have placed the company in a position to thrive in a new business environment defined by synergy and collaboration, as opposed to the old win-lose environment.

To complement its own core competencies, DIGITAL has formed strategic global alliances with industry leaders in five key areas: **operating environments** (Microsoft), **database and application management** (Oracle), **enterprise business integration** (SAP), **telecommunications** (MCI), and **enterprise IT management** (Computer Associates). Other formal relationships, with companies such as Sybase and Informix, complement the mix.

Will alliances work? History suggests that close partnerships can be daunting. In their muscular youth, companies like DIGITAL did it all: research and development, hardware and software design, manufacturing, sales and marketing, distribution, even packaging. Relationships with partners were often tempestuous, filled with competing agendas and sales channel conflict. Other obstacles stand in the way, too: Geographic distance and cultural differences, miscommunications and unvoiced expectations and internal inertia and even active resistance.

Still, the dance between technology and business behavior is quickening. Mainframe computing mirrored the business model of the 50's: centralized, hierarchical and rigidly controlled. Business processes proceeded in sequence. Client/server computing mirrors the model of the 90's: peer-to-peer, decentralized and autonomous. Processes unfold in parallel, driven by the need for rapid decision-making and quick response to marketplace demand.



JOHN BERRY/S.I.S

"We believe the world has entered a new age–An Age of Collaboration" –the Booz Allen report

DIGITAL, among many others, missed catching the crest of this wave of computing. And yet, because of its unique heritage, it is still a player. Energizing its core competencies and melding them with those of its Alliance partners is one of the keys to DIGITAL's future.

"The downsizing, consolidating and outsourcing of all but core competencies means that no single company can do it all anymore," says Gerard Van de Aast, vice president of DIGITAL's Corporate Strategic Alliances business group.

"The word today is partnership. For the minicomputer vendors of the 70's and 80's, that takes a tremendous mind shift. And not just at the corporate level. It's not too difficult to get senior corporate executives on both sides of an alliance to say they like each other. Our challenge is to optimize the alliances in the field–where DIGITAL sales people, Alliance partners and customers work together locally."

Alliances Take Center Stage

In an interdependent global economy, total self-reliance is an option that few companies will be able to afford. Strategic alliances are the wave of the future–even among competitors. More and more, alliances are viewed as a differentiating core competency. And companies with a formal, disciplined approach will achieve superior results.

Those conclusions are from a study of 5,500 alliances, and more than 500 companies, conducted earlier this year by Booz Allen & Hamilton. The consulting firm defines a strategic alliance as a relationship occupying the middle ground between an informal transaction between two parties, and outright acquisition of one company by another.

"We believe the world has entered a new age–An Age of Collaboration–and that only through allying can companies obtain the capabilities and resources necessary to win in the changing global marketplace," the Booz Allen report says. "Many academics and new-age gurus believe that cross-border alliances are a fad, but we strongly disagree. We are convinced that alliances are a central, essential and permanent engine to achieve growth."

As proof, the report points out that nearly 15 percent of the revenue generated by the Fortune 1000 comes from alliances–a fourfold increase since 1987. Also, average Return on Investment (ROI) from

strategic alliances is more than 16 percent, significantly higher than the return the same corporations earn on other activities. And ROI for experienced alliance firms is twice that of inexperienced ones.



DIGITAL and Its Alliance Partners

If strategic alliances are an innovative response to the global challenges of the 90's, then DIGITAL is well-positioned. But the company's own excellence in innovation (Alpha 64-bit computing, networking, VAX system architecture) has often struggled for a place in a more conservative marketplace. The business world is nothing if not pragmatic. Optimistic industry forecasts aside, alliances will succeed only if they work–today.

If strategic alliances are an innovative response to the global challenges of the 90's, then DIGITAL is well-positioned.

"If a company has decided to deploy Windows NT at an enterprise level," Van de Aast says, "the principal concern is this: given today's open and compatible product standards–hardware from Vendor A, software from Vendor B, services from Vendor C–who, at the end of the day, is responsible for making all this stuff work?" The answer, he believes, is DIGITAL.

With that as backdrop, here's a brief outline of each DIGITAL Alliance:

Alliance for Enterprise Computing:

DIGITAL and Microsoft

Customers get simplified choices: Windows NT solutions engineered by two companies who excel jointly at software, hardware and services.

DIGITAL gets strong market endorsement, accelerating its sales cycles and adding to services revenue. Microsoft gets a shot at WNT investments from other systems vendors much sooner.

Successes: 1.5 million new Microsoft Exchange seats. 29 Microsoft Authorized Support Centers in 100 countries.

Challenges: Leverage the success of Exchange into other growth areas such as workstations, Microsoft SQL Server and the Internet/Intranet.

Alliance for Networked Applications:

DIGITAL and Oracle

Customers get the fastest, most cost-effective systems for on-line transaction processing.

DIGITAL gets access to large and expanding markets that demand large-capacity, compute-intensive solutions. Oracle gets scalable hardware platforms which, with its own database software, can manage enormous quantities of data and make it all work with legacy systems.

Successes: Very Large Memory (VLM) 64-bit support on DIGITAL Alpha Servers systems running Windows NT. Record-breaking performance benchmarks for speed. More than 1,000 Alpha Server systems installed worldwide for data warehousing.

Challenges: Drive those capabilities into new areas: Internet, corporate Intranets, and interactive television.

Alliance for Enterprise Business Integration:

DIGITAL and SAP

Customers get scalable client/server solutions to reach for best business practices.

DIGITAL gets access to a new and expanding customer base. SAP gets access to targeted industries such as manufacturing, telecommunications and finance.

Successes:: First RISC-based Windows NT for SAP R/3 (1996). World record SD Benchmark on Windows NT (1997). 500 new customers this year. 20% market share growth, and 400% growth in Windows NT.

Challenges: Leveraging years of implementation experience into solutions for Year 2000 issues.

Alliance for Enterprise Management:

DIGITAL and Computer Associates

Customers get a total solution–industry-leading products and services–to control computing costs and anticipate problems.

DIGITAL gets access to world-class network management products and large accounts. CA gets, with DIGITAL Services, more complete solutions to compete with HP (OpenView) and IBM (Tivoli).

Successes: DIGITAL is one of the first vendors for CA's Unicenter TNG product to manage multiple operating environments. DIGITAL

is also a charter member of CA's Preferred Service Provider program.

Challenges: Assure customers that they can readily incorporate new capabilities (Intranets, Electronic Commerce) as they emerge.

Alliance for Intranet Computing:
DIGITAL, MCI and Microsoft

Customers get one-stop shopping for end-to-end Intranet solutions (self-built or outsourced and managed by others); integrated services for a comprehensive "information utility."

DIGITAL gets prime position in the race to meet demand for global telecommunications solutions. MCI gets powerful Alpha and Intel Webserver platforms, plus Windows NT and Microsoft BackOffice suite of server products.

Successes: The alliance itself, plus integrated turnkey packages of hardware, software and telecommunications.

Challenges: Managing relationships as the market heats up.

Strategy and Tactics

"The success of our alliances will be determined by two factors," says Van de Aast. "First, the solution we embrace with our partners must have a healthy market demand. Without that, there isn't any business. Second, the partner must be willing to work with you to provide those solutions–at the local level."

To address those realities, Corporate Strategic Alliances has moved to Worldwide Sales and Marketing, with a focus on successful products and local engagement. It is here, Van de Aast says, that alliances must make progress.

The success of Microsoft Exchange illustrates the point. By working with Microsoft and drawing on expertise developed with its own ALL-IN-1 mail/messaging product, DIGITAL has deployed more than 1.6 million Exchange seats worldwide in 18 months, capturing a 36% market share for the product. More to the point, 55% of those accounts are new, replacing Microsoft Mail, cc Mail, IBM PROFS, and Lotus Mail. Customers include Dow Chemical, Southern Company and Swiss Telecom PTT. In fact, DIGITAL hasn't lost a major mail/messaging deal to a competitor in the past six months.

Another major success has emerged from the DIGITAL-Oracle Alliance. A joint engineering effort developed Very Large Memory (VLM) capabilities on Alpha platforms to handle complex queries on large databases. The results? Gigabytes of data can be stored in computer memory, instead of on disk, improving system response times by a factor of 250. Suddenly, work that took days can now be accomplished in a matter of hours–even minutes.

Missed opportunities?

As the Booz Allen report notes, alliances among high-tech companies tend to focus on gaining market access and key capabilities. That demands careful study, compromise, and attention to details. Case in point: Oracle's Video Server software on Alpha platforms has not captured significant market share. Conflicting technical and marketing agendas have forced the two companies to regroup and try again. Elsewhere, the relationship with Computer Associates has encountered thorny issues involving the asset sale of DIGITAL's Polycenter product to CA. And the volatility of the telecommunications marketplace makes alliance-building a challenge for DIGITAL, as competing companies bid for ownership of MCI.

But in Van De Aast's view, missteps are balanced by successes which point to the potential of alliance initiatives. Example: the SAP R/3 integrated suite of business applications running on Alpha Server systems, featuring Windows NT and an Oracle database. Four different vendors with an aligned objective, a common market focus and a complete solution for the customer.

Alliances such as the one between DIGITAL and Microsoft can also improve competitive positioning. "Other vendors must now demonstrate unambiguous commitment to Windows NT by offering complete NT solutions (hardware, software, services) worldwide, supporting a global pool of Windows NT Certified Professionals and engaging in joint engineering and product development with Microsoft," says Dilip Phadke, director of marketing for the Strategic Alliances group.

"All of DIGITAL's Alliance partners are major forces in the industry," says Van de Aast. "The marketplace likes them. They're all growing at incredible rates. In the past, we've done an excellent job connecting with them at a corporate level in joint engineering activities and other breakthrough projects. The real challenge now, for my organization, is to harvest the benefits of that good work by gaining traction in the field via local engagements. Engagements turn into business, and business turns into growth." ❍

–Jay McManus



Make It and Sell It:

A TUTORIAL

In Brief: When you're on the front lines, whether in product development, sales or services, it's sometimes hard to listen, what with all those bombs exploding around you. Here's a real-world tour of DIGITAL with people in sales and development who have learned that listening sometimes means asking the right question of the right customer in the right way. Here's how they do it, and what they've learned.



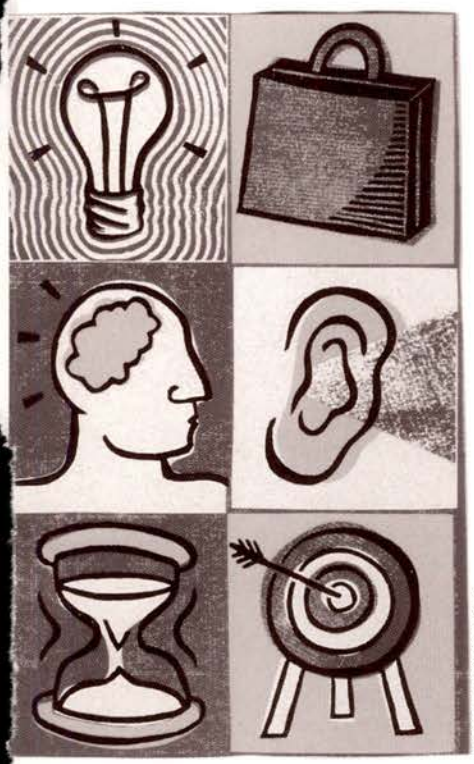
"We needed a rack-mountable version of the Prioris ZX6200 to head off the competition. We knew the industry standard cabinet was 19 inches wide, but when we proposed a 24-inch wide product, everyone we spoke with was sure we could sell it. Well, when we actually launched it, sales were almost non-existent."

Duane Dickhut, vice president and general manager of the NT Server Business Segment, tells this sad tale about developing and introducing a member of DIGITAL's Intel-based family of servers for enterprise-level applications. The story illustrates the most basic tenet of product development: KNOW YOUR CUSTOMER. "When we met with resellers and end-users, we talked with high-and middle-level managers, not with systems engineers and administrators in the IS department," says Dickhut. "These folks said they would buy the 24-inch product, but when we introduced it, the response was, 'We can't buy that–it's not standard!'"

Hindsight always provides valuable perspective. "The mounting pressure exerted by DIGITAL sales to launch a counterattack against our competitors really clouded our vision," says Dickhut. "In the rush to get input from customers, we did not pay attention to whom our contacts were within the accounts. We thought we had done our homework, and we really convinced ourselves that this non-standard product would sell."

Understanding the target market is essential for developing successful products. Sources of information abound–industry reviews and reports, feedback from focus groups, and first-hand experience of sales and marketing professionals. DIGITAL engineers even conduct "teardowns" of competitors' products, during which they physically disassemble a system. And while development teams take advantage of all of these, they usually give direct input from the customer the most weight.

But even asking customers straightforward questions about what they think is important doesn't always yield the "right" answers. "My experience with engaging customers in discussions about product requirements is that it's a real art to flush out their genuine needs and to recognize when you propose something that really strikes a chord in them," explains Dickhut. "Sometimes customers say a feature has value, but when it comes time to make a purchase, they aren't willing to trade off price or



VICKY RABINOWICZ/S.I.S.

performance. When you succeed in getting them to identify the fundamentals that resonate with them nine months later, when at the time of announcement they say 'Yes, I will buy that product,' then you have accomplished what you set out to do."

According to Dickhut, asking open-ended questions is fine for collecting information, but that technique does not necessarily lead to the most creative and productive sessions. "I'm a big advocate of sending up trial balloons with customers. Laying out several different product scenarios tends to stimulate their thinking. Plus it's a good way to test our learning from the teardowns because we get to see if specific features are of real value."

Within DIGITAL, product management is responsible for establishing the product requirements that drive the design effort. Under the company's well-established 5x5 model, a team comprising members from five key disciplines–product management, engineering, manufacturing, field marketing and product marketing–works closely with the product manager, prioritizing the requirements and negotiating tradeoffs whenever conflicts arise.

Tom Manter, manager of Product Management for the ZX 6200 family, describes the way the 5x5 process works. "In the early concept phase, the product manager writes a Product Requirements Document which is reviewed by all the functions, as well as by our area marketing people and selected customers, for validation and feedback. It defines the product requirements very clearly, and we use it throughout the development process to ensure that we meet the objectives that we initially set out to achieve."

As the different functions, such as engineering and manufacturing, work to develop and introduce the product, they sometimes encounter a conflict that requires deviation from the current development plan. In these cases, the 5x5 team solicits feedback on different design alternatives from the area marketing organizations. As the 5x5 members make tradeoff decisions, the product manager updates the Product Requirements Document, the vehicle that informs all those who have a need to know about the changes.

When DIGITAL designed the ZX 6200 server, tradeoff discussions went on for some time. "Our objective was to deliver a well-balanced system that had not only a robust CPU, but also a high-performance I/O subsystem to support mission-critical applications," says Dickhut. "That meant we had to couple the number of processors with the number of disk drives, and trade

Who are these customers?

off I/O and PCI slots. Each of the many design alternatives had different implications for power and packaging, as well as for development time and cost. We had to weigh everything carefully against value to the customer."

For most product developers, "customer" usually means the majority of a target market. But there is one organization within DIGITAL that does not need to worry about making tradeoffs in order to satisfy customers in the aggregate. The Computer Special Systems Group (CSS), by virtue of its charter, develops products that are guaranteed to satisfy DIGITAL's markets–one customer at a time.

Commissioned more than thirty years ago to serve the DIGITAL customers and partners whose requirements cannot be satisfied by configurations of standard system components, CSS has matured into a business that capitalizes on the industry's need for custom solutions. Lucien Philippon, whose recorded voicemail greeting welcomes the caller to "DIGITAL's best-kept secret," is the worldwide marketing director for CSS. "Judging from our revenue growth,



approximately three of every ten DIGITAL customers have special requirements," says Philippon. "And CSS has 500 engineers who are eager to respond with technical and systems integration talent to satisfy those requirements."

Who are these customers? The communications industry, for one. Throughout the world, deregulated telecommunication companies rely on specialized intelligent network and voice telephony systems. These products integrate standard and third-party components into packages that meet environmentally stringent requirements for installation over widely distributed geographic areas.

CSS customers include governments from many parts of the world. Civilian agencies depend on custom hardware and software for census recording, taxation, archiving and implementation of security measures. Philippon cites examples where military groups require the integration of standard products into ruggedized enclosures to support operations in harsh environments. "These customized systems that can be found



"...customers deserve our best effort."

performing critical functions in deserts and jungles–often on the front lines–are referred to as luggable computers. Working with our partners in Europe, we have deployed about 1,300 luggables to help keep peace in Bosnia."

Other CSS customers, who require not only customized hardware but also special integration services, are manufacturers who depend on real-time responses of production equipment to ensure product quality and employee safety. According to Philippon, CSS is the only organization within the company that



can develop a total manufacturing solution, one that integrates special hardware, third-party devices, custom drivers and the like, and install it seamlessly in an environment that is often hostile to the equipment that controls it. These manufacturers also depend on CSS to deliver DIGITAL's fully-clustered SAP R/3 and BAAN solutions, which cost-effectively manage Enterprise Resource Planning (ERP) applications.

For the finance and health care industries, CSS provides totally integrated solutions to Value-Added Resellers (VARs) such as Cerner and Shared Medical Systems (SMS). CSS delivers these systems ready to be "cut" into production environments where any disruption in operations could mean the loss of billions of dollars or even the loss of people's lives. Through Value-added Implementation Services (VIS), which are offered for 5-10 percent of the selling price, CSS takes the risk out of complex custom solutions. These services include design, testing and documentation, as well as staging within DIGITAL manufacturing where a full performance characterization ensures that critical applications will run as expected from the moment the system is installed at the customer's site.

"Sometimes it's not what we do, but the speed with which we do it that differentiates us to customers," says Philippon. Indeed, by applying readily available resources to work with a customer whose satisfaction need not be compromised to accommodate a whole market segment, a CSS team can design, characterize, test, document and install a complex product in less than 90 days.

"The CSS product development cycle is probably the closest one can get within DIGITAL to the ideal view of product management," says Dan Klein, group manager of Worldwide Segment Marketing for CSS. "You can summarize the CSS business as classic requirements-based marketing taken right from the textbooks: understand the customers' needs and give them exactly what they want."

Because DIGITAL owns the intellectual property for the solutions it provides, CSS can often fit one customer's unique product to another's application with minor tailoring. While designing for each of its customers, CSS marketing works with the group's product and segment managers to identify other customers with similar needs so that CSS can leverage its engineering investments.

Does a CSS product ever miss the mark? "Sometimes a customer says 'no' to one of our designs," says Klein. "After all, customers can be fickle. But they always deserve our best effort. Besides, it's pretty rare when we design something that isn't used more than once."

To promote CSS's capabilities and services, a cadre of Computer Special Systems Sales Specialists (CS4s) provides links to the rest of the DIGITAL sales professionals. In this way, the company brings a complete range of offerings to its customers: from off-the-shelf systems, to custom-configured solutions, to totally unique implementations. By using hardware and software from partners and third parties in addition to its own products, DIGITAL is able to convince customers that it is well-prepared for and committed to making them successful–"whatever it takes."

"Customers today are looking for vendors who are true business partners," says Jack Sunderlage,

vice president for Corporate Accounts in the Western U.S. "They want to have a feeling of trust, and to know that there's long-term credibility in our commitment to their success. If we can answer all their questions and show exactly how our solution fits their needs, it doesn't take any high-pressure selling tactics to get people to buy. When you have gone through the right steps with the right team of people, there seems to be a natural tendency for a customer to make a DIGITAL decision."

That right team of people who can respond quickly and creatively to the customer's evolving needs is essential to the selling process. "Having an effective team in place means that you can propose a fully integrated solution," says Bill Mersch, director of Human Resources for North America Sales and Marketing. "To do this, we must be sure that all our people are trained effectively, and that the account team has representation from all the right businesses within the company." In this team-selling model, the individual account manager is not required to be a product expert, but he or she must excel at listening carefully to the customer's problems and assembling teams who can translate those problems into solutions.

Once an account team fully understands a customer's needs and has configured a proposed solution, they can go to the customer with a demonstration, presentation or some combination thereof, or they can invite the customer to visit a reference site where DIGITAL has met a similar need. "I find reference site visits to be highly effective," says Sunderlage. "You have a third party who's pretty proud of what they've installed and they can speak specifically to the benefits they have derived from our solution. This provides far more credibility than anything DIGITAL could say directly." Reference selling is an option, though, only if customer satisfaction is a top priority for everyone at DIGITAL. As Karen Davis, director of Communications and Customer Satisfaction for North America Sales and Marketing, points out, "Satisfied customers become loyal customers and will not only buy from DIGITAL in the future, but will also recommend DIGITAL to others. That's the strongest form of advertising there is."

It's important not to underestimate the vital role of DIGITAL's partners as part of the selling process. The account team usually involves partners very early in the selling cycle if their application software fits the customer's needs, because having the right application software available to complement DIGITAL hardware and services is an effective way to ensure the solution's success.

In fact, most of the world today buys application software and services first–the hardware is almost always a follow-on. Because DIGITAL services have earned so many kudos over the years, many sales professionals use this competitive advantage to establish a foothold in a new account. The State of California is a good example.

In the early 90's, when DIGITAL began to gain prominence as a systems integrator, the company won a contract with California's Statewide Integrated Narcotics System. Heavy on services, this account, which was initially a $4M win for DIGITAL, is now worth $50M, and has helped to enhance the company's reputation for consulting and pave the way for many more systems integration projects. One such project, with the Department of Corrections, began a few years ago as a $300K service and consulting contract. Today, the project includes that consulting activity as well as more than $400K in hardware, and it recently created an opportunity for DIGITAL to submit a bid for $40M in hardware to support the entire State of California system.



Even after a sales contract is signed, there's still a great deal of work to do. There are frequent planning meetings, sometimes weekly, before any equipment is actually delivered and installed. The account team checks the configuration plan against the computer floor plan, reviews environmental requirements, and determines whether or not the customer needs training on a new operating system or layered software products. And during the installation process, there are still more meetings to ensure that nothing has been overlooked and to follow up on action items that were assigned during the earlier phases of the selling cycle. When the installation is complete, the account team provides ongoing service and support.

"Whatever it takes: an attitude"

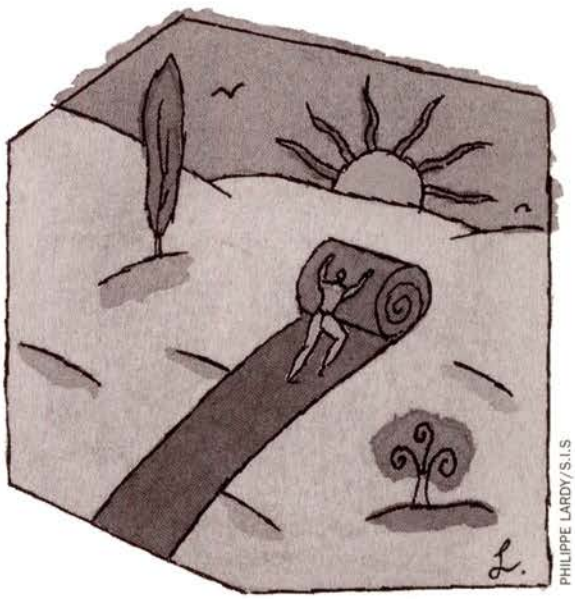


There are many who are working hard to ensure that a "whatever it takes" attitude permeates DIGITAL. The company's new leadership principles support the real organizational and business process changes that have been made to ensure that customers are everyone's top priority. From identifying product requirements to delivering post-sale support, there is one unequivocal, company-wide mandate: put "the right" customer first. ❍

–Barbara Watterson and Peg Wesley



Principle #1



PHILIPPE LARDY/S.I.S

One of the products of the Design Workshops held earlier this year was the formulation of DIGITAL's "leadership principles." On learning that the first principle was, "Customers are our first priority," many DIGITAL employees reacted with some level of skepticism.

In Brief: You already know what leadership principle Number One is, so we won't restate it here. What we do have here is a brief survey of "who's doing what" to make it happen. The point, as you'll see, is that DIGITAL 's Leadership Principles aren't just obligatory rhetoric. They're a way of life–our life as DIGITAL leaders.

"Here we go again," was a common response. Others included, "Aren't customers the reason we're in business in the first place?"

For the Design Team and members of the Executive Committee, the poor revenue performance over the past few years necessitated a back-to-basics or, as some put it, a back-to-the-future approach, to get DIGITAL growing again.

That customers come first is stating the obvious. "I haven't met a customer or come across a company that didn't have as a principle, the idea that customers were their first priority," says Bruce Claflin, senior vice president and group executive, Worldwide Sales and Marketing. "However, saying customers are first is one thing; making it happen is another. Painfully few companies succeed at it. Consider, for example, how many times during the course of a day that we are disappointed with the quality of service we receive in our daily personal business."

Claflin concedes that making customers a first priority is a tough challenge for all companies. But if DIGITAL is to compete successfully, its actions on behalf of customers must speak louder than its words. "At DIGITAL, we do better than many others, but not nearly as well as we should be doing," he says.

So what should we be doing? "Turn the DIGITAL organization chart on its head with the people who support customers on the top," says Claflin. "All the rest of us, including senior managers, are in support of those serving customers."

He explains that in order to make customers our first priority, DIGITAL needs to change many

processes as well as its attitude. "We are moving in two directions at the same time," he says. "We are systematically changing and improving processes so that our people can be more responsive to customers, and we are making cultural and attitudinal changes so that employees can be more responsive."

One palpable change gaining attention recently is the increased support field personnel are getting from the top. In a series of Growth Conferences scheduled in FY98 in different regions around the world, Executive Committee members are meeting with customers, account executives, field personnel, other employees, partners and members of the media. In the past four months, conferences were held in New York, Tokyo, Germany and Italy.

At the New York meeting, participants included John Rando, senior vice president and group executive, DIGITAL Services Division; Bruce Claflin; Ilene Jacobs, senior vice president, Human Resources; and Vin Mullarkey, senior vice president, Finance, and chief financial officer. "At our New York meeting, Vin Mullarkey called on Bankers Trust," says Claflin. "We discussed our business with them and their business with us. It was a very successful call. All the senior management team will continue to make calls like this in support of those serving our customers."

Chairman Bob Palmer's schedule reflects his personal commitment to making customers DIGITAL's first priority. In the first two quarters of FY98, he has met or talked with more than 160 customers, either at their company headquarters, in Maynard or in group settings such as the Customer Advisory Board. And in addition to his scheduled customer meetings at the Corporate Customer Center in Maynard, Palmer also makes as many as three unscheduled visits a week there.

Through the Executive Partner Program, customers are getting more and much-needed attention. This program assigns senior DIGITAL managers to one or two large accounts. "We are putting executives in front of customers to help them and to challenge and support the account managers," says Claflin. "These are not one-time visits. Once an executive makes a call, he or she is forever obligated to a lifetime relationship with that customer."

When the Leadership Principles were formulated, DIGITAL's Call Center was seven months old and was receiving widespread recognition for the speed and quality of service it delivered to customers. "The Leadership Principles and the Executive Committee's emphasis on customers represented a breakthrough for us," says Steve Davis, manager of the Call Center's Customer Advocacy Group. "Until we heard this customer message from the top, many hadn't taken us seriously. Now that has changed."

To further drive home the importance of making customers the first priority, DIGITAL established The Office of the Customer to gain leverage from customer programs and initiatives. "Our office consists of listening posts that include the Customer Advisory Board, DECUS, the Executive Partners Program and others. We take what we are hearing, analyze the information and use it to do a better job for customers."

"Every message we communicate externally or internally is linked to the customer," says Genevieve Houdent, internal communications manager in DIGITAL France. "Our senior people are more available to customers, and even employees who don't interact with customers are more aware that their work ultimately impacts customers."

When this reporter was researching this article, he interviewed scores of people, including a telesales specialist in the Littleton, Massachusetts Call Center named Jack Goodwin*. Goodwin, a 1997 Decathlon winner, covers the territory of southern Ohio. During the course of the interview, he interrupted me to take a telephone call. Six long minutes later, he got back to the interview and apologized for the interruption, saying, "That was my direct line, and when it rings it is usually a customer or a prospective customer. And customers always come first." Goodwin had talked to a prospective customer, a lead generated by one of the marketing programs initiated by one of DIGITAL's partners. "I got the information he needed," he says, "told him I would arrange for a VAR to come visit him as well as get the DIGITAL field sales rep involved."

Goodwin believes the renewed focus on customers is working. "When the leadership principles were announced, it was the second part of the first principle that really made a difference–that employees and partners who support customers are number 2 in the company. That's never been said before. It made people in the sales force feel better about what they were doing, that DIGITAL recognized their worth." ❍

–Sean Gresh

**We are saddened to report that Jack Goodwin died shortly after his interview for this article.*

Where did you get my name?

In Brief: Interesting. We got this suggestion from a responsible DIGITAL manager: "Why not go out and ask employees what they think is right and wrong with DIGITAL leaders?" So we did, starting with names we took at random from the on-line Notes pages of people who seemed concerned about various management practices. And guess what? Not only did NO ONE want to talk, they wanted to know why THEY were called. What does that tell us?

When my editor called with my latest assignment for The DIGITAL Leader, *I greeted the news with more than the usual amount of interest.*

> *"We want you to go out and talk to DIGITAL employees," he said. "Ask them what they think of the company, its goals and leadership, its pitfalls and problems."*

We discussed how to report the feedback, whether to quote people directly, use no names whatsoever, or just list people in a "contributing to this article" format. Quoting people directly, we decided, would put too much pressure on participants, but complete anonymity might rob the piece of credibility. In the end, we opted for a mix: respondents would be listed at the top of the piece, but no quotes would be attributed to any individual. He e-mailed me a list of folks randomly selected from a company database and, marching orders in hand, I began calling employees around the world to ask for their input.

All's too quiet on every front

Because of the nature of the piece, some resistance and caution was expected. However, we were caught completely off guard by the almost universal reluctance to have anything to do with the subject matter. My attempts to reach people via e-mail and voicemail (leaving a detailed explanation of why I was calling, what the article was about and where it would appear) produced a stunning silence.

More troubling were the responses from those I happened to catch "live." With few exceptions, the offer to sound off prompted an uneasy silence followed by a query both deeply revealing and disconcerting in its simplicity: "Where did you get my name?" they asked again and again. The first few times I was greeted with this response I thought little of it. Corporate would be glad, I



ROBERT NEUBECKER/S.I.S

One wonders, can people who are afraid to speak their minds really be comfortable taking risks?

suspected, to know employees exercised a bit of wariness. I offered the information I had about how the names were selected as well as my editor's contact information and waited, anticipating conversations as open and forthright as those I had conducted with DIGITAL managers for other DIGITAL Leader articles.

It was, in retrospect, wishful thinking. My attempts to re-contact individuals for the actual interview were in vain. As it turned out, most people never even called my editor and those who did begged off anyway. With the deadline looming, our first–albeit reluctant–reaction was to scrap the piece altogether. We couldn't very well write an article about what employees think of the company without any input from the employees. But was that really true, we asked? Perhaps we did have input, immensely valuable input. Not in the form we had been looking for or expecting, but input nonetheless. Maybe we just needed to listen differently.

Silence speaks louder than words

There's an age-old saying about silence speaking louder than words, and in their utter stillness, DIGITAL employees may have been trying to tell us something. It's possible their silence reveals an uncomfortable truth about their world–a world dominated, it would seem, by a pronounced fear of speaking up. Not very compatible with leadership principles designed to reward risk-taking and creativity and promote active listening.

One wonders, can people who are afraid to speak their minds really be comfortable taking risks? And if no one's really talking, where does active listening come in? Most importantly, what are the risks to the company's health from this dearth of feedback, especially in a corporate environment defined by decentralized responsibility, where day-to-day decision making affecting the happiness and contentment of customers is routinely handed over to those in the field?

Solutions?

Is there a solution? That's a hard one to answer, but we might begin with the comments of the few employees who did voice opinions. What they seemed to have in common was an unshakable faith in their immediate superior–the man or woman they see regularly and know, they say, very well. This is the person they trust and with whom they feel comfortable speaking openly. The DIGITAL Leader article unnerved them precisely because the managers who read the magazine are, in some way, strangers to them.

"We get a press release announcing the appointment of some manager, but that's all we really know about this person," explained one brave employee. "How can we risk speaking out to a power we don't understand? It's too dangerous."

Indeed. But how, in an organization the size of DIGITAL, can a sense of closeness be achieved?

"Why not use the Intranet to publish information about each manager?" volunteered another respondent. "Tell us about your responsibilities and goals, where you sit in the chain of command and how your office can be a resource to us, especially across business units–we have a tough time even understanding where to go for help when it's outside of our own business unit. And let us know where you've been successful and where you've struggled; you never know, we might just be able to help."

Familiarity, it seems, breeds trust and a willingness to be forthright. In an environment where employees feel close to management, protective questions like "Where did you get my name?" are, perhaps, unnecessary. ❍

–Susan Messenheimer

Letters to the Editor

Dear Editor,

I started reading your essay ["Can DIGITAL Change Its Culture?" Q1/98 issue] and got stopped cold at your interpretation of "Do the right thing".

I was in customer services and engineering during the 70's and 80's and it was ALWAYS understood that the customer was the ultimate decision influencer when there was a question as to what was the RIGHT thing to do. You are definitely rewriting history in this piece for a particular point about the BAD OLD DAYS.

In fact, we have had very loyal customers that have stayed with DIGITAL for decades because they knew that Do the Right Thing was Customer focused. If a customer issue got raised to Ken's (Olsen) level it would always be settled in favor of the customer and it would be a career limiting situation if it happened more than once. It was clear that doing the right thing for the customer was the right thing for DEC. Ken knew it and everybody else that faced a customer knew it too.

If you talk to folks that were in the field at that time they will tell you of numerous situations where DEC poured hardware, software and people into a problem to meet a customer expectation that may or may not have been reasonable, but it was the RIGHT THING to do.

Please get your facts straight...

Regards,
Dorothy Redner
(DIGITAL customer 1970-75,
DIGITAL employee 1975-current)

Dear Editor,

As an ex-DIGITAL employee who, up until January this year, put in 24 years of service in Engineering, I must say I was very disappointed by your article in the DIGITAL Leader ["Can DIGITAL Change Its Culture," Q1/98] about the pre-1992 DIGITAL culture, and of course the "new" culture.

As an consulting engineer who, from my very first days designing and writing systems software, has always worked hard to stay in touch with my customers, I find your statements about pre-1992 culture distinctly revisionist.

Indeed, from 1978 onwards, my work, and that of the thousands of engineers I worked with, focused very much on ways to listen to, understand and translate into excellent products–what our customers needed. In fact the very word "quality" was defined as "meeting and exceeding customer needs, requirements and expectations". And these sentiments, far from being empty words, were translated into concrete and measurable steps in market analysis, customer requirements and balancing this with technical innovation all through the product specification, design, development and delivery processes.

Today's DIGITAL would do well to do the same; and perhaps as well, to respect the years of hard work, creativity and customer focus of the thousands of engineers that has brought it to the leadership position it continues to enjoy.

With good wishes for DIGITAL's
continued success,
Chris Strutt



Editor's Note: We agree that DIGITAL certainly used to give primary attention to its customers. That's how the company grew to become a $13 billion business. But in the last several years customer satisfaction has fallen to record lows, and growth through new business has been far below the industry average. What the company is doing now, through our Leadership Principle which says "Customers are our first priority...," and through every organizational and procedural change, is putting the primary emphasis back on the customer. [*We encourage readers to share their thoughts with us.*]



digital

Digital Salesrep:

One of Digital's New Year's resolutions is to find even better ways to help you communicate with your customers. And we think Enterprise Magazine is a good way to start off 1987.

In your hand is the inaugural issue of Enterprise, the new quarterly journal produced by Digital's MIS marketing group in Marlboro, Massachusetts.

Large Systems News, under the charter of Large Systems Marketing, has primarily been used as a technical vehicle and sales communication tool for eight years. However, the time is upon us to change with the computing environment. That's why Large Systems News has been revamped and renamed to keep a new breed of readers aware of Digital's ever-growing presence and success in the Information Systems marketspace.

The result is Enterprise, a six-color magazine intended for Information System executives. Through testimonial articles and other assorted stories, Enterprise will offer its readers an inside look at how and why a wide variety of Digital customers are running their businesses with VAX computing resources. The stories will showcase companies across all industries--around the globe.

We invite you to read this first issue and pass it on to your IS customers and your fellow salesreps. Encourage them to send in the reply card to receive a free subscription.

We want to get Enterprise into the hands of IS managers, CIOs, and decision-makers and you can help us meet that goal. If you have any questions or suggestions, we are here to listen, so please contact us in Marlboro via telephone (DTN 297-4942) or electronic mail (ISBG:: MAJOR or BOB MAJOR @MRO).

Regards,

Bob Major

Bob Major
Editor -- Enterprise Magazine

Digital Equipment Corporation
One Iron Way, Box 1002, Marlboro, Massachusetts 01752-9102

VOLUME 1 NUMBER 1 WINTER 1987

enterprise

INFORMATION SYSTEMS JOURNAL



digital

In today's highly competitive business world, effective planning and implementation can mean the difference between outstanding and mediocre achievement.

As information managers, you are responsible for a wide variety of critical decisions—recognizing that your organization must respond to, and profit by, the computing technology explosion. And you have also learned that flexible plans, formulated to accommodate inevitable growth and change, are the most effective.

This situation demands not simply an information system, but an information strategy—one that provides the right resources for the right people through innovative, cost-effective use of today's available products.

Digital Equipment Corporation does not approach information management lightly. We recognize and understand how competition, productivity, and technology all combine to influence organizational success.

Digital can help you see into the future, to determine with confidence the type of information systems that best meet your needs. We offer 30 years of experience in interactive, distributed, and networked computing resources—from personal computers and workstations to some of the largest, fastest, and most powerful systems in the industry.

More important, Digital has the application experience to be a truly effective business partner. That's because we use our computing resources to run a $7 billion, worldwide corporation—our own. We understand the planning and strategies involved in information management because we have worked through the stages ourselves. Experience is a powerful teacher.

Thousands of organizations around the globe look to Digital to provide products and strategies that help meet their information management needs. *Enterprise—Digital's Information Systems Journal* is a vehicle to showcase precisely how some of these organizations are using Digital computing resources to run their business.

Enterprise will be relying primarily on a host of customer testimonial articles, brief product announcements, interviews with experts, and Digital senior management guest columns. It will be informative, colorful, and non-technical.

We invite you to read through this first issue and, if you wish to keep receiving a free subscription, or know some other people in your organization who would, please fill out the reply card and send it back to us. We'll make certain that *Enterprise* arrives each quarter with articles that showcase Information Systems management.

Regards,

Bob Major

Robert Major
Editor—*Enterprise*

VOLUME 1 NUMBER 1 WINTER 1987

enterprise

INFORMATION SYSTEMS JOURNAL

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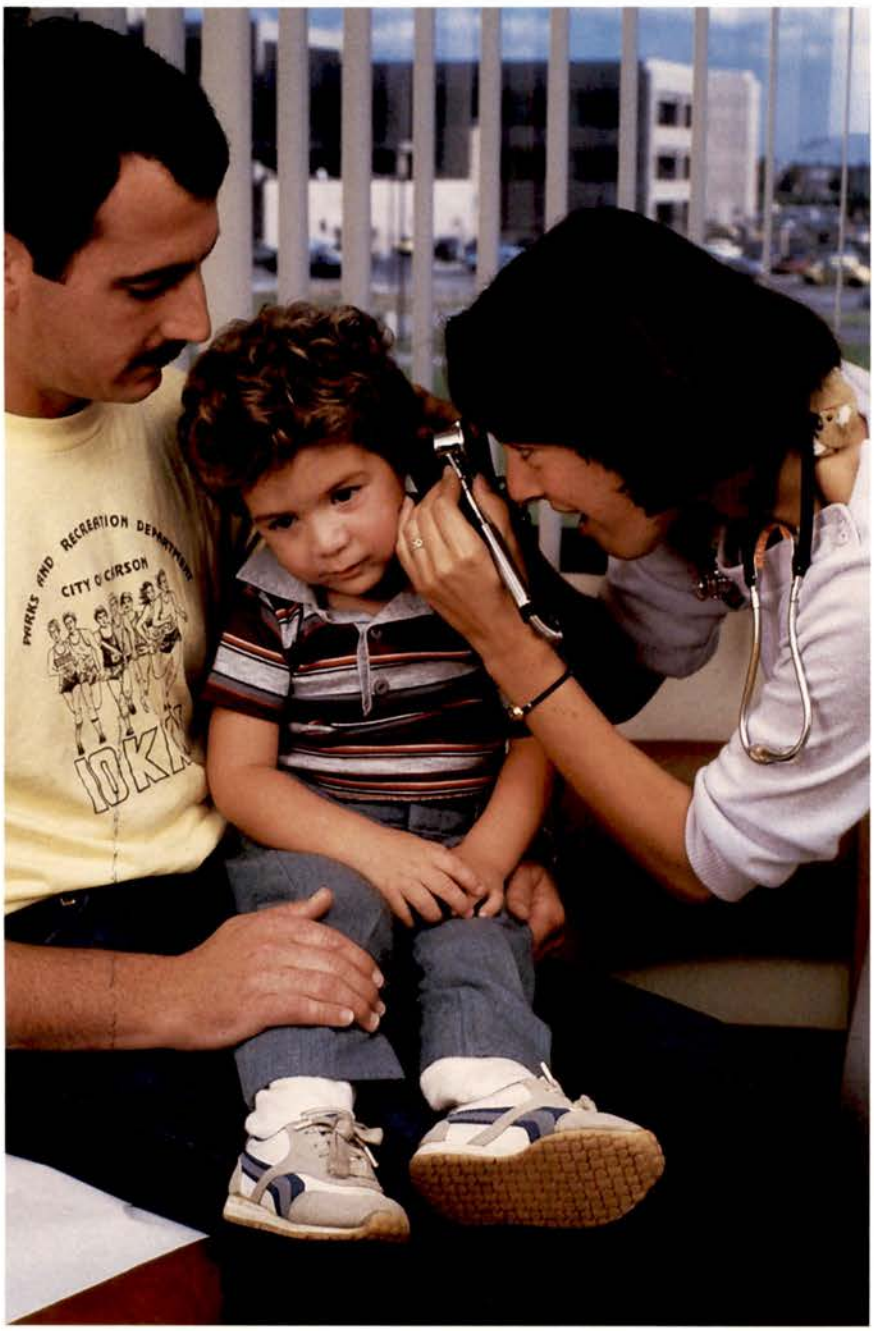
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Cover Illustration: Katherine Mahoney

Emerging
Health Maintenance Organization

AmeriCare



There's a major issue in the ongoing debate about the future of the health care industry. Can quality patient care be provided at affordable rates?

Less than a decade ago, Health Maintenance Organizations (HMOs) were established to help stem the tide of escalating medical costs. Since then, experience has shown that rational, medically designed cost-containment programs actually improve the quality of patient care. HMOs have become welcome relief to those most closely associated with the medical profession—hospitals, physicians, and, most importantly, the American public.

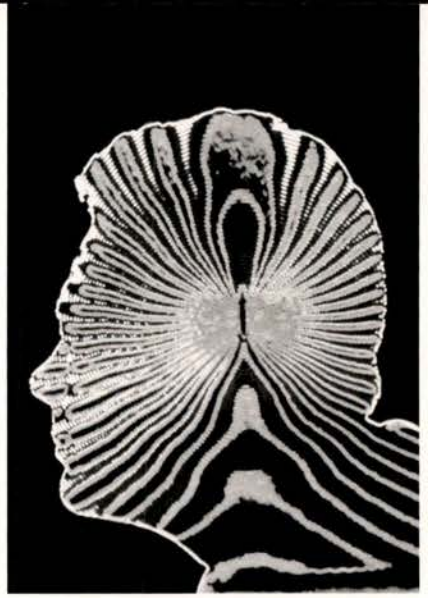
Research indicates that 75 million people, or 30 percent of the United States' population, will be HMO members by 1990. This same research shows that, as a whole, proprietary HMO companies can expect membership and revenue increases between 30 and 40 percent a year for the next four years.

Probably no health maintenance organization is better prepared for the future than AmeriCare Health Corporation. The California-based HMO has heavily invested in its pursuit of a significant and profitable market share in the exploding national health care industry. AmeriCare is entrenched in the philosophy that quality patient care—at affordable rates—can be successfully accomplished by combining the skill of top health care professionals with the savvy of business executives.

Developing an array of present and future business applications on a recently installed VAXcluster system, AmeriCare has postured itself for long-term business opportunities rather than for short-term results.

A Sprouting Corporate Profile

The genesis of AmeriCare Health Corporation was in 1978—with the establishment of Foundation Health Plan, a nonprofit HMO headquartered in Sacramento, California. In 1984, Foundation was converted to a for-profit company, and AmeriCare was created as the parent corporation.



If we're going to be a force in the national marketplace, we must follow our early visions of a fully integrated system. I envision every piece of that system being supported in some way by Digital products, services, and strategies.

AmeriCare's business strategy calls for the development or acquisition of two to four HMOs each year for the next five years. However, AmeriCare has exceeded its plan in just the past two years by entering the national scene in five new states: Oregon, Washington, Nevada, New Mexico, and New Jersey.

Foundation Health Plan, AmeriCare's largest HMO, has also been expanding its operations and now serves enrollees in 20 northern and central California counties. Through marketing and expansion efforts, Foundation serves nearly 2,000 employer groups and 145,000 members. It now contracts with 34 hospitals, 1,900 physicians, and 100 ancillary providers.

With creative, aggressive, and entrepreneurial ideas filtering down from corporate leaders, AmeriCare Health Corporation has quickly grown to become the fifth largest publicly held HMO in the United States today. Parallelling that level of growth is the rising need for an information and applications system that goes beyond traditional claims processing.

Changing of The Guard

AmeriCare was using two Hewlett-Packard HP 3000* systems and a half-dozen smaller HP machines to process claims from its six remote locations. But over the past 18 months, AmeriCare's hardware and applications software have not been able to keep up with the increasing volume of claims. Old software was patched together to keep it working, and the less-than-efficient software caused a severe strain on the HP's overall performance. And showing some reservations about Hewlett-Packard's delayed entry into the 32-bit arena, AmeriCare swung its computer search doors open.

Management decided to seek a "system" that went far beyond claims processing. The system would require high service levels, innovation, and cost-effectiveness. And most of all, it had to be flexible. For these very reasons, and superior networking capabilities, Digital was chosen to serve as AmeriCare's preferred computer supplier. In early 1986, a VAX 8650 and VAX-11/750 were installed as the centerpieces of a VAXcluster system. In November, a second VAX 8650 was added to help handle the ever-increasing workload of the VAXcluster.

John Voltmer, AmeriCare's Director of Management Information Systems, explains the late-1985 decision to convert to Digital. "Claims processing is certainly important, but from a 'new system' perspective, we viewed it as more of an ancillary process," he says. "We were more concerned about an information system that could help us manage our business. We narrowed our list down to three computer manufacturers, but Digital's distributed processing solution was the rallying point. We haven't experienced anything yet that has given us second thoughts about our decision.

"The VAXcluster is an ideal tool to collect and analyze a wide range of medical-related information," notes Voltmer. "We can use the information to help keep people healthy. Or use it to develop better systems. And even use it to show how we can become more profitable. By accessing the database in our VAXcluster, we're able to find out medical histories, trends, and interventions. In turn, we can help people get better care at a lower cost. And just as important, we can work in harmony with doctors and employers.

"With easy access to up-to-date and accurate information, we feel we're having a very positive affect on the medical community."

Fourth Generation Products Help Development

Voltmer's MIS department is working successfully with the additional CPU horsepower and its new set of accompanying Digital applications development tools. MIS Project Manager Scott Millis is responsible for the creation and implementation of a series of applications that will be used extensively throughout



AmeriCare and its affiliates in the next few months. With the complete backing of top management, Millis is nearly halfway through a 95 week project. The finished product? A fully integrated application solution based entirely on the VAX Information Architecture. It promises to project AmeriCare's MIS capabilities to the apex of the health care industry

"I knew this ambitious project would be all the much simpler because I came to AmeriCare directly from another Digital-based environment," remarks Millis. "AmeriCare wants to have ONE system. Yet it has to be robust enough to handle a variety of our requirements. That's why the VAXcluster is critical. Rather than having a special implementation at each affiliate's site, we can run the business from here, yet still offer remote sites the opportunity to access the data they need—through a MicroVAX II or DECnet. Local information processing is a key to local service."

Millis and his 20-member MIS staff are nearing completion of the first phase of it applications development. When finished the system will offer AmeriCare users a fully integrated marketing system, a fully integrated quality assurance system (for medical review and health-related issues), premium accounting, underwriting, and data analysis. And of course, faster and more efficient claims processing.

"The project is on schedule and under budget," Millis notes. "We're writing these systems from scratch, and we're using just about every layered Digital product—VAX Rally, Rdb, Teamdata, TDMS, ACMS, Test Manager, CMS, and MMS. With these products, we'll be able to develop our application software in less time and complete the HP-to-VAX conversion much faster.

He continues, "Establishing VAX Information Architecture standards was important. We can design our system to these standards—knowing that they're not going to become obsolete. As Digital comes

out with new products, tools, and enhancements, we know that they'll be able to interface with anything we have—or are planning to design.

"Digital's ability to provide Software Service consultants to support our development plan was also a key factor in the decision to use the VAX Information Architecture," remarks Millis. "We also have a fulltime resident consultant here—with expertise in database management, transaction processing, and networking—to complement our inhouse MIS staff. Having such trained experts has been a big boost to the project."

The Key? Distributed Processing

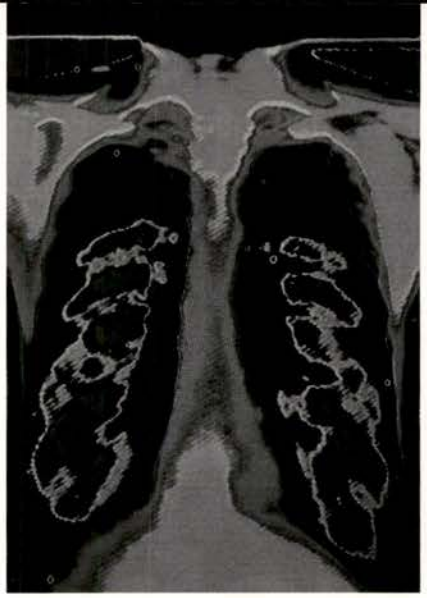
With its control system, AmeriCare is making quality care more accessible and gaining more dollar advantages for the enrollee and the employer than might otherwise be available. By managing its ever-growing database, AmeriCare will soon be able to supply a patient's medical background to a physician and process claims faster than ever before.

"If a medical expert suspects a particular disease or ailment," says Scott Millis, "we'll soon have an artificial intelligence-type program to assist in our research. We're also hoping that a new range of medical knowledge comes out of the database. Doctor's don't need to become computer experts, but we want them to learn how to analyze the important data that will be available to them."

Millis explains that the focus on distributed processing is Digital's strong suit. "Digital's distributed style of computing is very attractive to an organization like ours. The technical superiority and presence is obvious—the VAX family is reliable and flexible. And the nice thing about VMS is that it runs on all VAX processors. Users don't have to worry about which CPU they're on."

"As a corporation," explains John Voltmer, "our ultimate goal is to use the wealth of information at our disposal to dramatically improve the 'wellness' of our enrollees. Some people may ask whether we would sacrifice quality to obtain a business advantage. People will not stay in a health care plan that sacrifices quality for money. Our low disenrollment rate demonstrates the quality of our health plans."

"AmeriCare's automated resources have grown as fast as the company," Voltmer concludes. "We've certainly recognized just how critical a system can be. Not only us in particular, but to the health care industry in general. If we're going to be a force in the national marketplace, we must follow our early visions of a fully integrated system. I envision every piece of that system being supported in some way by Digital products, services, and strategies." □



AmeriCare is entrenched in the philosophy that quality patient care, at affordable rates, can be accomplished by combining the skill of top health care professionals with the savvy of business executives.

Johnson & Johnson

For Johnson & Johnson, keeping pace with rapid changes in the health care field means heavy reliance on research. Nearly half of the company's 165 worldwide subsidiaries run their own research divisions; 40 such research divisions are located in the United States alone.

How large a role do information systems play in J&J's research efforts? "Computer technology is as key to the success of the corporation as sterilization," explains Ralph Bradshaw, director of research and scientific services at Johnson & Johnson's Management Information Center in Raritan, New Jersey.

Bradshaw may not be exaggerating. Johnson & Johnson subsidiaries such as Ortho and McNeil perform and document a staggering array of tests on its pharmaceutical products to satisfy the Federal Drug Administration's stringent requirements. The compliance cycle traditionally takes five to seven years per product, but advanced computer applications at Johnson & Johnson have lopped a year or more off of that time.

That's a crucial difference because a new pharmaceutical product may bring in $50 to $100 million in sales its first year. Therefore, each week that a drug is kept off the market could potentially cost the company $1 to $2 million in revenues. In addition, being first on the shelves means capturing a larger share of the market for years to come. The second place finisher typically settles for a much smaller share.

Separate From Corporate IS

Given this sort of bottom-line impact, it's not surprising that Johnson & Johnson takes the information systems needs of its research divisions quite seriously. One result is Bradshaw's Research & Scientific Services department—acting as something of an information center to its U.S.-based research divisions. This department is separate from J&J's corporate information systems groups.

"It's hard for information systems people to understand the ramifications of the services they're delivering to researchers who have specialized analytical skills," explains Bradshaw. "In order to provide the right level of computer support for researchers, we need to have people that understand research themselves. It's even better to have the research computer support group act as an arm of research—answerable to the research divisions."

Bradshaw's group meets that qualification. The department receives direction from a steering committee comprised of research managers that have been chosen by divisional research vice-presidents—all of whom consider computer support to be of strategic importance to their companies.

The department was launched in the early 1970s and provided time-sharing services to a variety of Johnson & Johnson research groups. Ralph Bradshaw then realized that the department was spending more than 80 percent of its time maintaining old applications. He decided to gradually shift the efforts of helping researchers select off-the-shelf software to making them more self-sufficient. He also started moving away from centralized processing. After researching a number of computer manufacturers, Bradshaw recognized that Digital was in the best position to provide the foundation for distributed processing and networking—through its VAX architecture.

Since we're worldwide with our products, we need communications capabilities to help each other and to implement global management.

Easing Researchers Into Control

Bradshaw's staff now helps researchers determine which applications are better suited to run locally. "Research people feel they need to maintain control of their computer resources," he notes. "They're trying to gain insight into physical processes by analyzing data from tests that aren't easy to repeat. They want to be sure their hardware and software are up to it."

Bradshaw's department eases researchers into that control by allowing them to begin with timesharing on large VAXes and then moving applications to a smaller local computer when the researcher is ready. "We act as a springboard," he remarks.

According to Bradshaw, hardware is now becoming less of an issue. Instead, research groups are looking to his department to set standards, identify new technologies, and search out the best software packages for the project. For example, when researchers expressed a desire to improve the lines of communication between different groups, the department, with assistance from Digital, set up pilot projects in the areas of electronic mail, videotex, and computer conferencing. The department also helps negotiate volume discounts and identifies other ways of keeping costs down.

A key goal of the department has been to help researchers gain enough proficiency with computers to carry out their work independently. "Some research people want to understand how the application works and how to control it," says Bradshaw. "We're providing these people with extensive training. Others want to learn just enough to get the job done. We're providing them with well-defined applications that run by themselves."

The Networking Factor

One issue that quickly became a top priority in the department was networking. In fact, it was Bradshaw who envisioned the need for networking some years back. That "connected corporation" philosophy played a large role in selecting the VAX systems for his department.



He declares, "We have a high level of interest in networking—reaching right to the top of the company. Suddenly, everyone sees the need. Since we're worldwide with our products, we need communications capabilities to help each other and to implement global management."

Digital's networking capabilities have alrady helped the department handle several challenges. For example, a recent computer facilities move was carried out without disrupting users. And the VAX's communications gateways have enabled researchers to hook into systems from other vendors, including the IS department's IBM mainframe.

The VAX architecture's flexibility fits in well with what Bradshaw is trying to accomplish at Johnson & Johnson. "We've tried not to restrict the ways people can use a computer here," he insists. "We don't have a particular set of solutions that we try to force fit people's needs into. Our objective is to keep people from having to come back to us—without discouraging them from coming back. If I push them out too fast, they'll just turn somewhere else. Research has a lot of clout in this corporation." □

British Petroleum



The sun *almost* never sets on British Petroleum. And although its mother country no longer claims an empire that spans the globe, England's largest company comes pretty close.

British Petroleum—a huge, diversified corporation with subsidiaries in oil, gas, coal, chemical, nutrition, mineral and other energy-related industries—maintains business interests on six continents, and in the oceans and seas in between.

The company's familiar logo—a green shield featuring yellow BP letters—can be found on towering oil rigs in the stormy waters of the North Sea, on huge supertankers cruising between the world's major ports, and on gas pumps at local filling stations.

British Petroleum was founded shortly after the first Middle East oil discovery in 1908. Since that seemingly inauspicious start in the desert of what is now Iran, British Petroleum has emerged as an energy giant that now employs more than 120,000 people worldwide, generates over $50 billion in annual revenues, and ranks as one of the five largest companies in the free world.

Gaining The Competitive Edge

The energy industry, always a volatile business even in good times, has been severely shaken in the past few years. The current glut of oil and gas has caused a sharp downturn in prices, shrinking the profits of industry leaders and even forcing some smaller competitors out of business.

Now more than ever, oil companies are looking for an edge on the competition. Increasingly, management is depending on information systems to provide the strategic data necessary to make prudent business decisions in difficult economic times.

This emphasis on strategic management information systems is evident at BP North America, the British Petroleum subsidiary that serves as a corporate



headquarters for BP's wholly-owned operations in the United States. Those operations include the development of highly successful oilfields on Alaska's North Slope, as well as a partial interest in the 800-mile TransAlaska Pipeline System.

Far from the frozen tundra of Alaska's North Slope—in the center of frenzied New York City—is BP North America's headquarters, and the focal point of its MIS operation. In his Rockefeller Center office on Fifth Avenue, John Donlan, the Manager of Information Systems for BP North America, talks about the goals of the MIS department in servicing the company's diverse business interests.

"Providing better management information is the main target," says Donlan, a British native who has worked in New York for more than six years. "The future developments here ought to lead to the ability to provide corporate management with more and more up-to-date information on the activities of this whole group."

To achieve these ambitious goals, BP North America is depending on an assortment of Digital VAX computer systems to control and process the deluge of information generated by its subsidiaries.

Tracing Its Digital Roots

BP North America's computing resources have come a long way since the company first began automating its information management functions nearly seven years ago. In 1980, British Petroleum began making major investments in its North American operations. At that time, the New York office used only a small installation of IBM equipment to handle information processing.

"In 1982 we took a look at what we wanted to do," Donlan recalls. "It was obvious that the IBM systems were running out of steam and that our company was growing. So we conducted a study on where we should go with our computing."

After performing an in-depth review of BP North America's operation, an independent consulting firm recommended Digital as the vendor that could best serve the company in the future. The MIS department then began working with Richard Seuss, Digital's BP Account Manager, to build a system that would handle the company's diverse needs.

"It was fairly unusual at the time, because we were buying Digital for purely commercial applications," says Donlan. "There was no real technical drive to it." At the time of the study, the company was operating only a few VAX systems in San Francisco, and those were running little more than seismographic and other highly technical applications used for oil exploration purposes.

"We knew networking was going to be important and that we were going to be a distributed operation," explains Donlan. "We decided on the VAX solution as being the most efficient one for our needs." Donlan says another factor in the purchase decision was the availability of packaged software, which would allow the company's small MIS department to easily operate its VAX system—while eliminating the need to hire a large applications development staff.

The ease-of-use factor, along with networking, were the two major reasons we decided on Digital.



"I think this ease-of-use factor, along with networking, were the two major reasons we decided on Digital," says Donlan, adding that Digital's reputation was also an important factor. "We needed a major vendor and Digital is high on BP's list of those types of companies it wants to do business with."

Supporting an Array of Functions

At the center of BP North America's MIS effort is a four-node VAXcluster system that has been operating since February 1986.

At the end-user level are a variety of Digital VT terminals, DECmate and Rainbow standalone systems, and a handful of IBM personal computers.

"The VAXcluster has certainly done all we wanted it to do," says Donlan, who has seen the MIS department's workload multiply over the past few years. "We were running out of steam—first with a VAX-11/780, and then the VAX-11/785. But the VAXcluster has made all the difference."

The MIS department handles all the information processing needs for the 100-member corporate staff, and also for BP's pipeline and chemicals subsidiaries headquartered in nearby Rye, New York. The department, which is comprised of only six people, performs a wide range of financial and administrative applications.

The VAXcluster supports accounting functions such as receivables, payables and other general ledger items. It also handles tax preparation for the various operating subsidiaries in North America. This financial data is then reported, through a DECnet network, to British Petroleum's world headquarters in London.

BP North America's planning and development department uses the company's computing resources to generate planning models that help corporate decision-makers. In addition, the personnel department uses the VAXcluster to run Digital-developed application tools such as DATATRIEVE to control its database of staff histories, life and medical insurance premium calculations, and other benefits adminstration information.

The trading room's bookkeeping operation is supported on the VAX-11/785 as a real-time operation. "In fact," says Donlan, "one of the screens that these dealers have in front of them is a VT emulation screen that gives them balances and a picture of what is happening in the market."

The computer system controls all the currency transactions, generates the confirmations to banks, tracks the positions of world currencies, and performs the accounting work for the entire operation. "We have a very sophisticated system for enabling the dealers to concentrate on dealing and yet have all the more mundane aspects taken care of," Donlan says. "That can only help their productivity."

Although the three international currency trading operations primarily work as independent entities, BP North America relies on an extensive DECnet network (with 300 nodes) that allows New York headquarters to maintain vital communication with the numerous operating companies owned by British Petroleum worldwide, and with its own subsidiaries on this continent.

The VAXcluster supports word processing, electronic mail, and the general office automation needs of the New York City office. Terminals in New York feature an integrated directory that allows access to systems in the United Kingdom.

Managing Money—The VAXcluster Way

Just recently, BP North America has added a new dimension to its role as an energy company. A money trading room, in which BP traders buy and sell foreign currencies to better control the company's overall financial resources, began operating late last summer with the help of the VAXcluster.

"Energy uses money, and this is one of the most efficient ways to manage your money," explains Donlan, adding that BP trading rooms are already established in London and Melbourne, Australia. "Large quantities of money flow around BP, and, in this day and age, we want to make the best use of it."

"As the corporate headquarters, they [the subsidiaries] have to submit information to us," says Donlan, adding that tax reporting is one of those situations when information transfer is essential. "Obviously, DECnet is very useful for that. And we really like the ease of use. If somebody gets a new VAX or changes a VAX, it's quite easy to plug it in and carry on. The management of the system—even with our 300-odd nodes—is very easy."

Developing More IS

"We now can see," says Donlan, "a steady growth path both in terms of individual machines and in the VAXcluster concept." Today, BP North America's VAXcluster handles the steadily increasing load of information and applications necessary to control its far-flung operations. And the job is not likely to get any easier in the near future because, although the current oil and gas crunch may have slowed the pace of growth within the industry, British Petroleum is committed to expanding its North American operations.

The further development of management information systems is an integral part of the company's drive to maintain a leadership position in its energy businesses. Donlan says he is heartened by recent statements from high-ranking BP officials, who say information systems will play a crucial role in business operations during the coming year.

"The company is making a commitment to improving and expanding information systems," says Donlan. "It's another important business tool. And that's what it all comes down to."

First Computer:
1980
Used for:
accounts receivable

Order of Computer Usage:
1 accounting
2 tax preparation
3 personnel
4 pipe line scheduling
5 financial planning
6 office automation

First Information System Installed:
1980

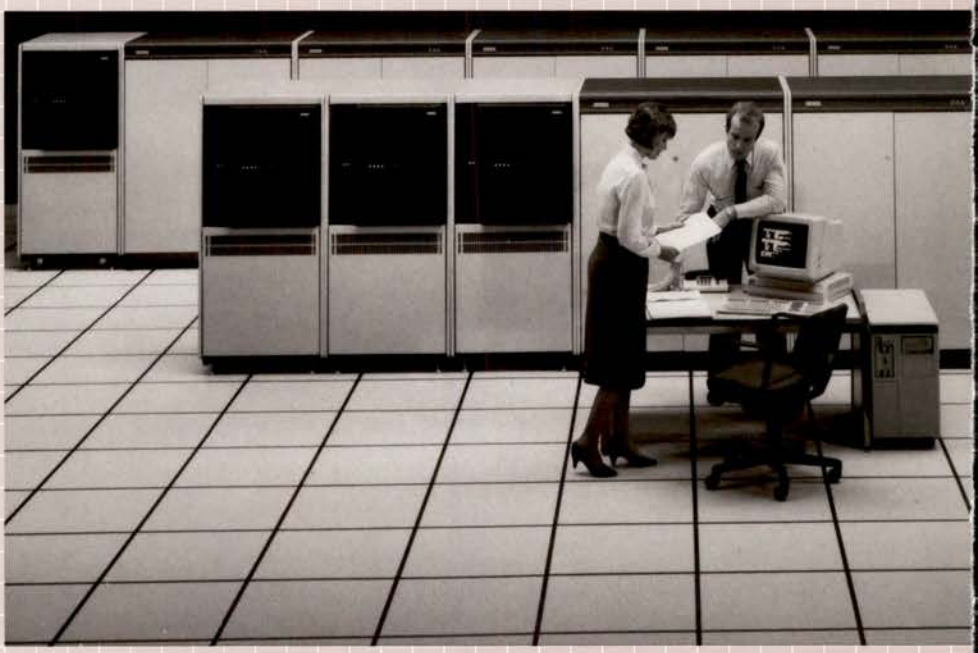
Future Usage:
further development of management information systems

NEW

Today, large corporations are recognizing that Information Systems must play a much more proactive and strategic role in business. As Information Systems management, you are charged with building an organization that can develop computer systems into strategic and competitive weapons to help achieve corporate goals. And you are responsible, company-wide, for Information Systems architecture, strategy, planning, and direction.

The Society for Information Management (SIM) annually surveys its IS management members. The top three issues that continually face you as an IS executive are the improvement of IS productivity, the facilitation of end-user computing, and the integration of data processing, office automation, and telecommunications.

For 30 years, Digital has been successfully addressing these concerns through a steady diet of new products and long-range strategies. The tradition continues in the form of three recently announced, related products that fill a niche in Information Systems computing.



VAX 8974 and VAX 8978

Using proven VAXcluster technology, many organizations have expanded computing power, storage capacity, and communications capability incrementally as their particular needs expand. Traditional mainframes simply cannot offer organizations this combination of power and flexibility.

Digital's new VAX 8974 and VAX 8978 Systems are distributed, networked, and user-friendly systems that can satisfy computing needs previously thought to require traditional mainframes. As part of Digital's total solution for large organizations, VAX 8974 and VAX 8978 Systems offer a new dimension in flexibility. Organizations can distribute information and computing resources—while still maintaining some centralized control.

Delivering up to 50 times the performance of the VAX-11/780, these new VAX systems are designed for high availability and optimum user productivity. The VAX 8974 and VAX 8978 Systems share a single architecture, VAX, and one operating system, VMS. Corporate computing and information processing applications, as well as departmental and desktop applications, can be efficiently and cost-effectively implemented. Powerful and flexible system management features also enhance utilization of total system resources.

Capacity for Your Most Demanding Applications

VAX 8974 and VAX 8978 Systems provide general-purpose computing and information processing capabilities for a wide variety of commercial and technical applications. Their high performance and high availability features are ideal in diverse industries with demanding computing requirements.

The VAX 8974 and VAX 8978 are complete systems. Their multifunctional, timesharing environments are able to support both interactive and batch workloads that can consist of many concurrent applications.

Digital's VAX architecture provides greater availability than do traditional mainframes. When a major new version of the operating system is installed, each processor can be rebooted individually—



thus the system remains functional. Hardware components are redundant or dual-accessed for greater operational availability. A malfunction or preventive maintenance in one component will never disable the entire system or render any of your data or applications unavailable. Systems can be configured for no single point-of-failure.

In addition to HSC I/O processors and SA482 storage arrays, the VAX 8974 and VAX 8978 Systems feature two products that enhance system management functions.

Volume Shadowing records data on one or more compatible physical disks that form a shadow volume set. Once the shadow set is created, most users and most software regard the shadow set as a virtual unit. Data that's read from the shadow set can be taken from any one member of the set. This means that your users have access to data even when one volume is unavailable.

The VAX Performance Advisor (VPA) is a performance surveillance and analysis tool that works with existing VAX/VMS utilities to provide tuning recommendations and performance reports. VPA examines system statistics and parameter data, and makes suggestions in a fraction of the time it would take an experienced system manager. In combination with existing monitoring tools, VPA provides you with a total performance management package.

VAX and VMS Spell Success

The batch environments of traditional mainframes may have several subsystems which must be layered on top of each other for interactive computing. Applications based on individual designs must then be layered on these subsystems. This can result in significantly greater system overhead expenses. Under the VAX 8974 and VAX 8978's unified architecture, more system resources are available to users.

The VAX 8974 and VAX 8978 are also configured network-ready. The value added is that Digital has more than ten years of experience in operating installed networks and, with over 5,000 installed VAXclusters, is recognized as the industry's leading networking vendor.

Digital's networking solutions offer high-speed communication links to systems and other resources for employees located in single buildings or multiple buildings. Through Digital's wide area networks, communication across the country or even the world is available for the VAX 8974 and VAX 8978 systems now.

Another major benefit of the networking capability is that communication with existing equipment, including IBM, is supported by existing networking and communications products.

Sharing a Common Set of Resources

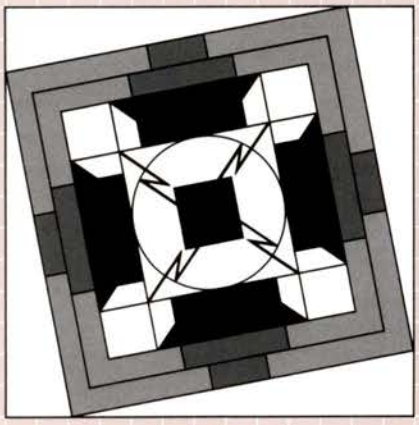
The VAX 8974 is comprised of four VAX 8700 processors, with eight in the VAX 8978. The processors are connected by a high-speed bus and two or four mass-storage servers. The processors operate as a single system—sharing a common set of information and communications resources. The system acts as a single entity. Any user can have access to whatever data or system resources are resident throughout your VAXcluster. The VAX 8974 and VAX 8978 can be expanded without making any existing software or hardware investments obsolete. One system. One investment.

The VAX 8974 and VAX 8978 systems' components include:

- **VAX 8700.** The heart of both new VAX systems.
- **SA482 Storage Array.** Provides 2.5 Gbytes of online disk storage.
- **Computer Interconnect.** Performs error checking, bus contention arbitration, path failover, and communications optimization.
- **Hierarchical Storage Controller.** An intelligent mass storage I/O server that connects the VAX 8700 processors to a maximum of 24 mass storage disks or tape drives.
- **Star Coupler.** The common connection point for all the coaxial cables from the VAXcluster.
- **VAXBI I/O Bus.** A high-performance, 32-bit bus engineered for high data throughput and reliability.
- **Network Interconnect.** A high-performance synchronous communications controller that provides UNIBUS connection to Ethernet local area networks.

Your computing needs will change as you develop new applications and as departments grow at different rates. Will a traditional mainframe really meet your needs? Or will a VAX 8974 or VAX 8978 system better enhance your organization's productivity and give you a competitive edge? Give people the resources they need while still retaining departmental control.

For more information about the VAX 8974 and VAX 8978, its components, and its potential, please contact your Digital sales representative.



Local Area VAXcluster Systems

Key to Information System environments is Local Area VAXcluster Systems (LAVC). They offer the combination of team computing and workstations in a single, VMS-based environment. Users are linked together via Digital's Ethernet and can share a central set of resources—including a common file system or software library. This greatly simplifies the IS' task of managing and maintaining software and application libraries. And the integrity and security of the data, programs, and systems are all improved—because they can be managed directly by the Information Systems group.

The Local Area VAXcluster environment insures the consistency of data while offloading "systems management" responsibility from the end user.

Local Area VAXclusters offer a single, shared-file system that's available to the entire cluster of computer systems. They also offer host-access to both Digital and IBM systems (via optional software products), diskless workstation support, full system and network security, central system management via the network, transparent host access, and distributed resource management with workstations and host-compute load balancing.

Local Area VAXcluster Systems offer the advantages of a timesharing system:

- Low-cost resource-sharing of plotters, printers, and disk servers
- Single system management—backups, software updates, maintenance, system addition, and VAXcluster control are performed centrally
- Easy and transparent access to large VAX systems—including large and high-speed storage devices, processing power, and communications to routers and SNA and X.25 network gateways

VAXclusters for VMS environments unify the best features of traditional timesharing systems and workstations. The result is an environment with unmatched user productivity, individual user flexibility, and smooth system growth and integration.

Application Systems Development Environment

Today's Information Systems departments are also being challenged by a fast-developing trend: enhancing productivity to meet the design, development, implementation, and maintenance demands of application systems.

But there are significant hurdles to clear. The IS department's heavy investment in maintaining an aging applications portfolio, its attention to growing applications backlog, and response to the priority for IS solutions to business requirements all obscure the need for improved tools and methods.

Digital's Application Systems Development Environment (ASDE) offers Information System professionals a series of highly productive development tools and solutions. Combining an assortment of proven software tools and hardware and communications products, ASDE helps programmers/analysts develop new and easily maintainable applications in less time. ASDE also decreases the time necessary in maintaining existing applications.

The Application Systems Development Environment helps increase programmer productivity. It allows application development to occur in a distributed environment and conveniently automates the testing and tuning processes. And it actively promotes a team computing environment by improving communication between programmers and their users.

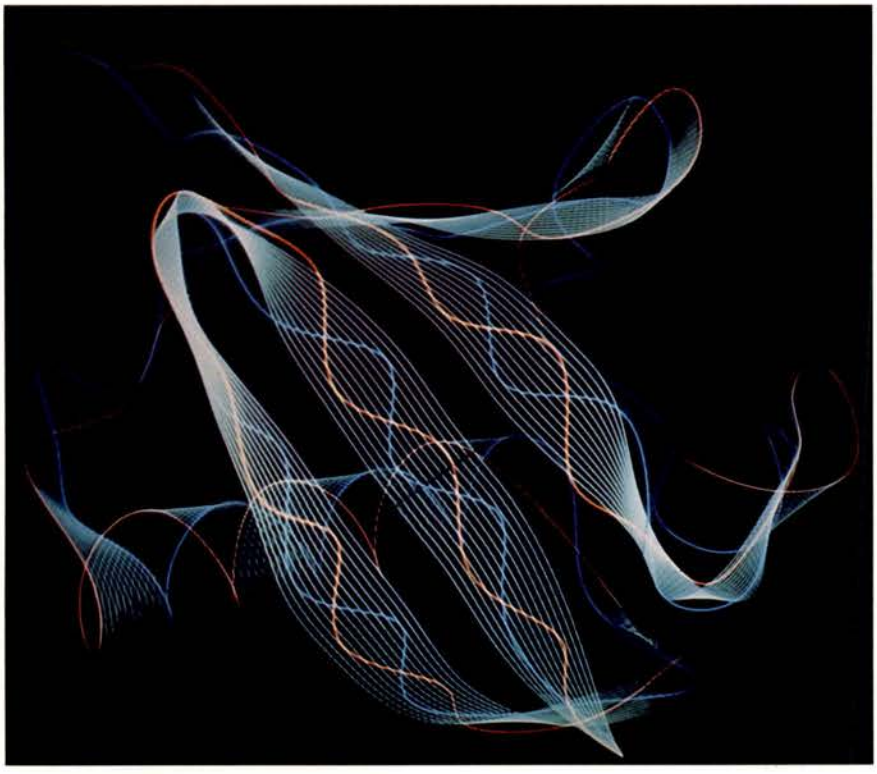
The Applications Systems Development Environment operates on the entire family of VAX processors running under Digital's VMS operating system. Whether using a VAXstation 2000 in a Local Area VAXcluster, in graphics-intensive environments, with a MicroVAX 2000 system acting as a resource server, or using terminals directly connected to a larger VAX processor, your programmers and analysts work productively in a compatible, creative, and easily expandable and configurable environment.

Building application systems encompasses the management, analysis, design, creation, testing, and tuning of the overall process. ASDE automates these steps with such integrated components as the VAX COBOL Generator, a VAX/CMS Code Management System, VAX/MMS Module Management System, VAX DEC/Test Manager, a VAX Performance and Coverage Analyzer, a VAX Language Sensitive Editor, and VAX Notes.

Today, approximately 50 percent of elapsed development time is spent in analysis and design. The more-mechanical phases of coding, testing, and implementation consume the other 50 percent. Digital's VAXstation 2000, MicroVAX 2000, and Local Area VAXcluster provide the ideal team environment to accomplish both sides of the application development process.

For more information about these new products and strategies and their use in Information Systems, please contact your Digital sales representative.

evansandsutherland



In this model of the protein ubiquitin, the red thread approximates the positions of carbonyl oxygen atoms while the blue thread approximates the positions of amide hydrogen atoms. Hydrogen bonding is readily apparent to the crystallographer by close contacts between the red and blue curves on adjacent segments of the ribbon.

"Information workers must have the best information-processing tools and resources at their fingertips. They should not be dependent upon data processing specialists. People here at E&S are learning to access the system directly because the resources are in place for them to take on their own computing responsibilities."

This end-user computing philosophy is being successfully implemented by Les Venemon and his MIS staff at Evans & Sutherland Computer Corporation—one of the country's largest and most prestigious engineering firms.

Evans & Sutherland is headquartered in the University of Utah Research Park in Salt Lake City, Utah and also supports branch offices in Cambridge, United Kingdom, and Munich, West Germany. The company has become an industry leader in the design, construction, sales, and service of special-purpose digital computers, software systems, and projection systems.

These customized systems are used in applications that require or are aided by a visual presentation of a digital model stored in computer memory. By using an Evans & Sutherland machine or software system, an operator may build, interact with, explore, or analyze the digital model and see the resulting changes in the visual output. The user may rotate, change the point-of-view, zoom into, or change relationships between parts of the visual output and immediately see the results of the change.

Evans & Sutherland has proved that, under the right circumstances, giving end-users complete control over their applications can lead to corporate success.





This equipment has both commercial and scientific applications—pilot training simulators, design engineering workstations, graphic arts design workstations, and scientific research.

At one time, Evans & Sutherland's internal systems manager, Les Venemon, was faced with the problem of trying to provide a disparate group of employees—with widely differing needs—with the right level of computing resources. He and his MIS team of 20 wanted to do this without having to install as many systems as there are staff to use them. Also, they wanted to do it without having to hold too many hands for too long.

"Ideally, information should flow quickly and smoothly to everyone in the company," says Venemon. "The best way for us to reach our goal of integration is through a common vendor interface. Digital has made a major commitment to integration—multivendor integration, integration of products and services, and integration of its system's architectures. We've come to count on Digital as a primary source for our information resources."

These resources add up to a VAX Information Center.

End-Users' Self-Motivation

One of the oft-stated goals of Information Centers is to give end-users responsibility for their own applications. The philosophy behind it is simple enough. End-users know best what they want, so let them be the ones that produce it.

The extent to which this is achieved is governed by a variety of factors. How motivated are the end-users? How prepared is MIS to relinquish total control over applications? What resources are available to be able to turn the idea into reality?

At Evans & Sutherland, there is more than average motivation. The company's products are heavily entrenched in the information processing field. Many are for government departments, and thus hidden behind a shield of security. All depend quite literally on state-of-the-art techniques for their success.

Evans & Sutherland's information center is entirely VAX-based. Included is enough application software to meet the needs of every end-user. These applications are made available in a way that is similarly responsive to the real needs of the business.

The VAX Information Center showcases an assortment of reliable Digital and Digital-compatible resources—VAX 8600 and VAX-11/780 computers in various VAXcluster systems. PDP-11s, MicroVAX IIs, and VAXstations. The VMS and ULTRIX operating systems. Languages such as BASIC, COBOL, FORTRAN, and Ada.* Development tools like DBMS, ACMS, TDMS, DATATRIEVE, TEAMDATA and VAX RALLY. Utilities such as VAXmail, VTX, and Videotex. Networking products and services such as DECnet and Ethernet. And Rainbow and VT-compatible terminals on nearly every employee's desk.

It continues with applications—VAX computer support for a personnel system and database, general ledger, accounts payable, accounts receivable, purchasing, cost accounting, word processing, master production scheduling (MPS), material requirements planning (MRP), bill-of-material processing, inventory control, and shopfloor control.

Distributed Computing

"An information architecture should parallel the organizational structure of a company," says Venemon. "If you have a highly distributed or decentralized style of management/organization, then your information system should reflect that. Because of our company's makeup, we're managing our information systems from a

"People here at E&S are learning to access the system directly because the resources are available for them to take on their own computing responsibilities."





By using an Evans and Sutherland machine or software system, an operator can build, interact with, explore, or analyze a model and see the resulting changes in visual output. Les Venemon anticipates that computing will someday become as easy to use as a telephone.



distributed approach. Response has been very positive because our system users have come to like the ease of interactive access to the resources and facilities on their computers. They've become more productive."

He adds, "By combining Digital and non-Digital tools and resources, I feel we're developing the best approach in fulfilling our need for full-scale computer integration. For example, VAXmail has become an integral part of our system. It has opened up a whole new avenue of communications—not only across a room, but across the ocean. We're using Ross Systems and inhouse-developed modules to run our accounting functions on the VAXcluster. In the manufacturing department, we've discovered the advantages of yet another good product, CODAYSL DBMS. And we're now evaluating Videotex. I feel it's going to provide us with even more computing options."

Digital has been supplying automation solutions to Evans & Sutherland since 1968. Les Venemon predicts that the trend will continue for years to come. "As our company continues to grow," he remarks, "so too will our information-management demands. Digital offers the benefits that make an 'information environment' work best—price, performance, power, functionality, and integratibility. Because of Digital's open system architecture, we can, at any time, add capacity to our system without impacting our existing applications systems.

"Because of the information center concept," concludes Venemon, "each employee at Evans & Sutherland will soon have the ability to access a corporate-wide database. Someday, we hope computing will become as easy to use as the telephone."

Evans & Sutherland has proved that, under the right circumstances, giving the end-users complete control over their applications can lead to corporate success. □

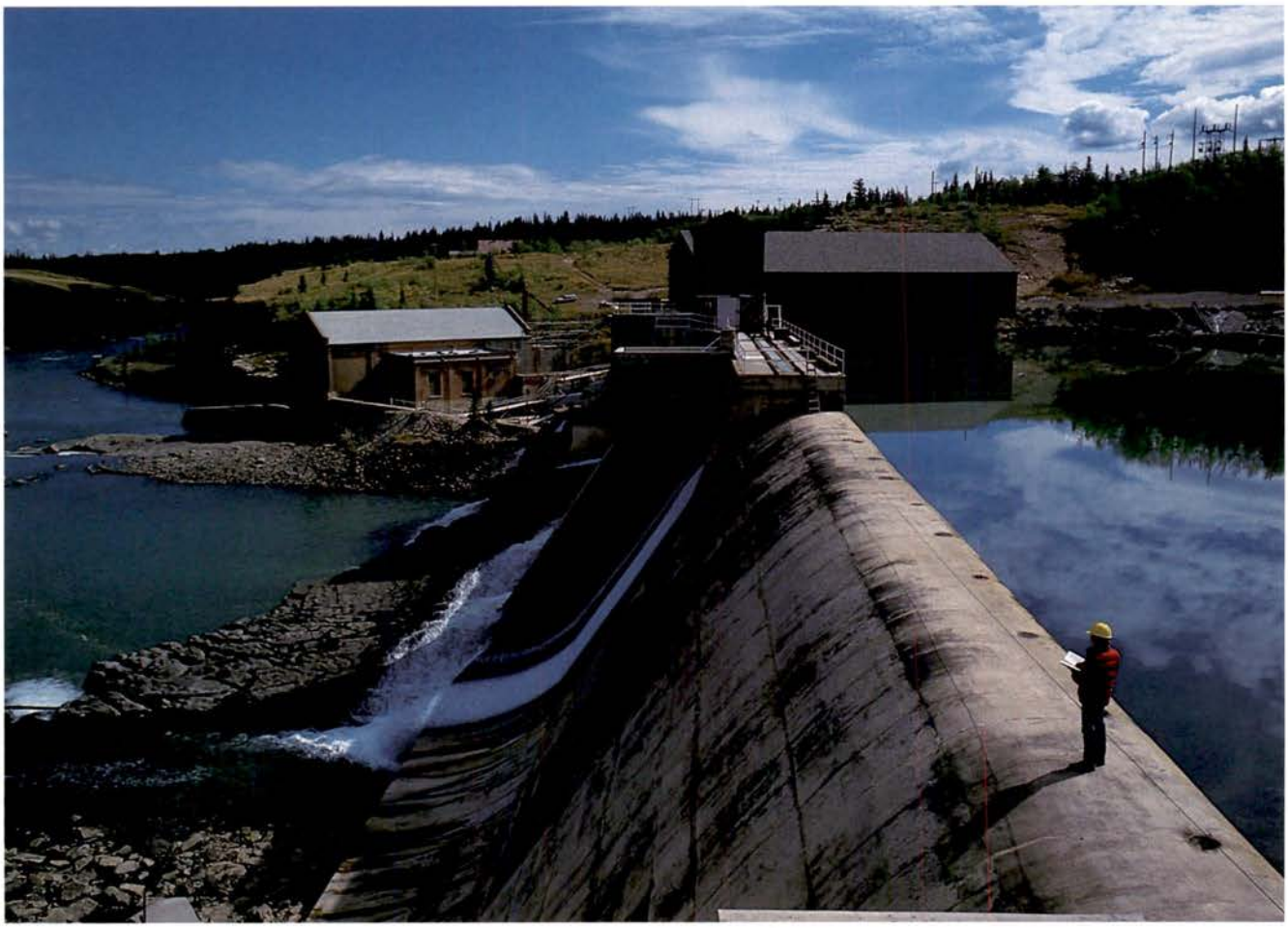
First Computer:
late 1960's (PDP11's)
Used for:
graphic SW and HW products

Order of Computer Usage:
1 product development and manufacturing
2 administrative and office applications

First Information System Installed:
1980

Future Usage:
computer integrated manufacturing

TransAlta



The primary objective of the TransAlta Utility Corporation is to provide safe, reliable, and cost-effective electric service to approximately 300,000 customers in over 600 cities, towns, and villages in the Canadian province of Alberta.

The investor-owned utility has been engaged in the production and sale of electric energy since 1911. In 1985, Calgary-based TransAlta supplied directly, indirectly, or through wholesale supply contracts, about 80 percent of Alberta's electric energy requirements.

Few organizations understand the principles of distributed operations better than the major utilities. It's not any different at TransAlta. Reliability, cost-effectiveness, and efficiency are as equally important in another aspect of the corporation's business: providing computing solutions to most of the 2,500 employees scattered throughout some 50 provincial sites.

"We emphasize a 'workstation-on-every-desk' philosophy."

The key to its success is information. Information for the engineers who need to monitor supply. Information for the regional offices that need to administer billing. And information for the marketing groups who need to develop new market opportunities.

TransAlta's success in carrying out its particular missions would not be possible without the automation resources delivered by a VAX Information Center. The company is relying on a gamut of Digital and third-party computing resources—accessing clustered VAX computer systems from 1,100 end-user desktop workstations.

Blessing of Management

The idea of implementing the Information Center concept originated directly at the top of the corporate ladder. "Our president and vice-chairman of the Board of Directors were big proponents of automation," states Murray Nelson, TransAlta's Director of Management Systems.

He adds, "Over the past few years, they have come to rely on computers as an important tool in helping to make a variety of business decisions. That tradition has been filtered all the way down the corporation. We emphasize the philosophy of a "workstation-on-every-desk." It helps our employees stay productive. It keeps them in touch with co-workers across the hall or even 300 miles away. And it gives them access to any type of information their job calls for."

Ongoing operations at TransAlta include a continuing program of substation development, refurbishment, and upgrading as demand for electricity grows. Costs and progress related to diverse sites must be gathered and consolidated—providing essential input to the decision-making process. The range of possible applications has put pressure on the Information Center to be highly flexible. "We want to make computing an integral part of end-users' jobs," says Dave Favreau, Manager of the Information Center.

More Than Accessing a System

The Information Center's role in TransAlta encompasses a variety of components—end-user consulting and support, administrative management, and training.

Consulting and support comprises a range of important functions—a popular telephone hotline to discuss issues and exchange ideas; hardware and software recommendations; and applications development services and support. Administrative management is growing by leaps and bounds as well. A major application currently under development will provide a whole range of corporate-wide information to senior management. It will combine project status-reporting with other goal-related information—to improve the cost-effectiveness of operations through better planning.

Training has also become a very significant ingredient of the VAX Information Center. Seven full-time members of Dave Favreau's staff advise and train a wide variety of TransAlta employees. "We respond to the needs of the end-user," he notes. "We can fly a new secretary into our Calgary training center for two days of intense hands-on experience or we can send our folks up to Edmonton to instruct an engineer on new application software. Our information center resources allow us to be flexible."

"No other utility is using as much automation as TransAlta," Murray Nelson says. "We have a breadth of products working together to form a very successful Information Center. It all adds up to a totally integrated environment. With six VAX 8600s, two VAX 8650s, and two VAX-11/785s, we certainly have the power to support all our users. And with over 2,000 pieces of end-user equipment, we're offering our users fast and convenient access to many powerful computing resources and tools."

Nelson believes that people, armed with the best resources, are an important cog and provide the competitive edge in any well-managed corporation. TransAlta is continuing its development of an even more effective organizational team to meet new and changing internal and external conditions. By combining computing resources from Digital and selected third-parties, Nelson believes the atmosphere surrounding his Information Center spells success for the corporation.

"The VAX Information Center helps address many of our business issues," he concludes. It is 'value' computing—meeting our needs in a integrated, powerful, convenient, and cost-effective way. Whatever its location, each of our workstations represents an individual information center. Yet, through the power of the clustered VAXes that are part of the network, we're also able to deliver our entire information resource wherever it's needed." □

First Computer:
mid-1960's (IBM 1401)

Used for:
customer accounts (record keeping and billing), and general accounting system

Order of Computer Usage:
1 all financial systems and modeling
2 engineering
3 office automation
4 end-user computing (Datatrieve)
5 CAD/CAM for computer mapping

First Information System Installed:
mid-1960's (with introduction of 1401)
mid-1970's (all financial)
1980's (engineering and office automation)

Future Usage:
(within 5 years)
- computer accessing of old paper records
- looking into scanning equipment for facsimile onto optical disks

PAR

Technology on the Cutting Edge



Peter Rukavena

PAR Technology Corporation, a systems engineering and software development company based in central New York State, is on the threshhold of becoming a national force in the software systems marketplace.

PAR has grown significantly in each of its first 15 years—with revenues skyrocketing almost 600 percent since 1981. Forbes Magazine, echoing several glowing assessments by the business press, recently ranked PAR as Number 26 on its annual list of the top 200 small companies in America.

PAR was founded in the early 1970s as a research and development subcontractor working almost exclusively for a local Air Force base near its headquarters in rural New Hartford, New York.

Today, PAR Government Systems—the new name of the company's wholly-owned military subsidiary—performs highly-sophisticated systems engineering and software development work, including missile research for the proposed Star Wars space defense system, in conjunction with the U.S. Department of Defense. Virgil Romiti recently arrived at PAR Government Systems as its president after a stint at a large aerospace company.

The total corporation, PAR Technology, now employs more than 1,000 people and generates over $70 million in annual revenues. In addition to its government subsidiary division, PAR also owns and operates a subsidiary that develops computerized point-of-sale systems for restaurants.

Depending on Digital

Like so many small companies that have come so far so soon, PAR Technology has had to cope with the changes wrought by its tremendous success. But the one constant, since the beginning, has been Digital's computer systems—the hardware of choice for PAR Government System's staff of talented programmers, analysts, and software developers.

PAR Government Systems uses a VAXcluster, consisting of two VAX 8600s and three VAX-11/780s, to develop its military defense systems and to also control the finances and administration of its rapidly growing business operations.

"Digital has always appealed to the engineering side—the technology side—of our company," explains Peter Rukavena, director of marketing for the government systems division, from his office at the company's headquarters just outside of Utica, New York. "The ease of doing software development on Digital equipment, with its operating systems, its debuggers and all its other tools, is important for someone who's developing sophisticated software."

PAR's defense-related specialities include strategic and tactical decision analysis (for example, artificial intelligence and expert systems that help commanders make battlefield decisions); signal pro cessing (such as systems that detect, locate and jam communications as part of electronic warfare); and imagery and vision enhancement (systems that identify and track natural terrain features and man-made objects that show up on military imagery systems).

SDI a.k.a. *"Star Wars"*

"Basically, we're problem-solvers," says Rukavena. "The government comes to us with a problem and we put our people and our knowledge against that problem."

PAR officials found it necessary to evaluate computing power in light of the company's extraordinary growth.

PAR is performing what Rukavena calls a "significant amount" of research involving SDI, President Reagan's proposed Strategic Defense Initiative, commonly referred to as Star Wars. PAR is involved in the "foreign launch assessment" area, which is concerned with detecting and locating incoming missiles during the critical moments just after launch.

To build these complex intelligence systems, PAR's software developers rely heavily on the full range of VAXcluster resources—including its development capabilities under the VMS, ULTRIX, and UNIX* operating systems.

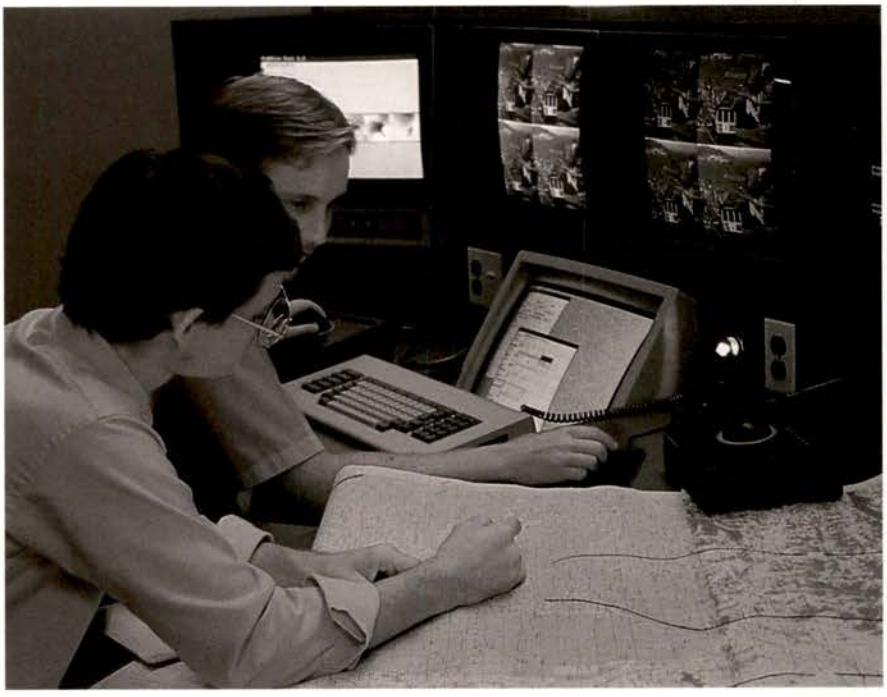
In addition to its highly specialized systems development work, PAR runs an array of financial software on the VAXcluster system to handle its overall corporate accounting functions, including receivables, payables and other general ledger items.

PAR's current hardware installation includes the two VAX 8600s and three VAX-11/780s that comprise the VAXcluster, along with 24 hard disk drives, three tape drives, and an HSC50 controller for data storage and control. Over 200 VT terminals provide user access to the system.

Growing With Digital

The long-standing business relationship between PAR and Digital began in the early 1970s, when PAR was a tiny start-up company. PAR's first product, a software system that performed statistical correlation and analysis of radar image patterns, was developed for the Rome Air Development Center, the local Air Force base in nearby Rome, New York. The system was called Pattern Analysis and Recognition—thus the initials that gave PAR its name.

In those early years, Digital was one of the few computer vendors that showed any interest in working with the young company. So PAR founder Dr. John W. Sammon Jr., the company's current chairman and president, made a commitment to Digital's top-of-the-line PDP-11 minicomputers for his company's software projects.



"We've always been very impressed with what Digital has to offer— the breadth of product in both hardware and software," says Rukavena. "And Digital had always been very responsive to PAR's needs."

By the late 1970s, PAR had become a multimillion-dollar business. PAR officials found it necessary to evaluate the company's computing power in light of this extraordinary growth. They decided to invest in Digital's VAX architecture as the cornerstone of PAR's software development and information management systems.

"I think one of the major advantages was that we were already a PDP-11 user," says Rukavena. "And even though it was in emulation mode, there was compatibility between much of the software developed on PDPs and VAXes." PAR Government Systems also wished to keep pace with its biggest customer—the Rome Air Development Center. The key to much of PAR's success is its ability to develop effective software systems for the local Air Force installation, which has traditionally been a large Digital user.

"We've always been very impressed with what Digital has to offer—the breadth of product in both hardware and software."

"We are very much customer-driven," explains Rukavena. "Digital has been an extremely successful company with the Air Force. Our use of Digital equipment has been driven very strongly by our major customer's use of Digital equipment. It's been a very good match."

High Competition

PAR Government Systems has enjoyed steady growth and is now positioning itself as a nationwide force in the defense contracting industry. The division recently opened a network of five Technology Centers at strategic business locations throughout the country. One is based at the company's home in New Hartford. The others are located in Los Angeles, Washington, Dayton, and Colorado Springs—regions with heavy concentrations of high-technology and defense-related industry.

Each of the Technology Centers uses at least one VAX-11/750 to develop software systems for local customers, and to control its own business operations. These remote offices are linked to corporate head quarters, and to each other, through a DECnet network that enables them to exchange technical and financial data.

The investment in the Technology Centers, according to Rukavena, is part of PAR's effort to transform itself from a research and development firm to a full-scale systems integration company. To achieve this goal, PAR is beginning to bid on large multimillion- dollar contracts against companies that are much older and larger than itself.

"The competition is becoming fierce—absolutely fierce," says Rukavena, adding that many major defense contractors are now turning their attention to niche markets, such as software development and systems integration, that lead them into direct competition with PAR.

But Rukavena says he's confident that the company can maintain its record of remarkable growth. The government systems division is currently pursuing about 80 contract opportunities, both locally and nationally, for the upcoming year. And Digital will be there to help out.

"Digital has developed new hardware and new tools to our satisfaction," says Rukavena, with just a hint of understatement. "I think we'll be together for a while." □

First Computer:
early 1970's (PDP-11)
Used for:
software system development

Order of Computer Usage:
1 software development of defense projects
2 financial accounting
3 technical publications

First Information System Installed:
mid-1970's

Future Usage:
(within 5 years)
- sophisticated simulation work
- more extensive and sophisticated inter-company communications

PAR Technology has had to cope with the changes brought on by explosive success. But the one constant since the beginning has been Digital's computer systems.





When the Xerox Corporation introduced its first automatic office copier in 1959, a new industry was virtually created overnight while the world moved one giant step closer to the Information Age.

Today, an original Xerox 914* copier is on permanent display at the Smithsonian Institution in Washington, and the company's name remains synonymous with the revolutionary product and process it developed.

But Xerox is no longer the only name in the photocopier industry. Today's market has become highly competitive—particularly with recent challenges from several major foreign companies. Whether Xerox will remain the industry leader may depend, to a great extent, on what happens in the gently sloping hills of upstate New York, along the south shore of Lake Ontario.

There, in the rural town of Webster, is Xerox Joseph C. Wilson Center for Technology—a research, engineering and manufacturing complex named for the former company president who staked his then small company's future on the technology of xerography. The Wilson Center is the world's largest photocopier facility, with more than 8,000 employees working in 70 buildings covering over 1,000 acres.

The complex, located just 15 miles from Xerox' original corporate headquarters in Rochester, is home for the company's Reprographics Business Group (RBG). The group encompasses the copier, duplicator and printer product lines, which account for 70 percent of Xerox's business revenues.

Although it has built a $9 billion a year empire by helping other businesses create and copy information, Xerox has come to recognize the importance of processing its own business information.

Implementing Financial Info Systems

To efficiently control its worldwide operations in a suddenly competitive market, the company is actively developing information systems that will aid its management decision makers.

Xerox has come to recognize the importance of processing its own business information.

Willard C. Hunt, Manager of Financial Systems for the Reprographics Business Group, realizes the crucial role financial information systems play in a huge company such as Xerox—a company that makes, and spends, millions of dollars a day.

"My responsibility," explains Hunt, "is to deliver productivity tools to finance professionals."

Hunt and his three-person staff of systems analysts are responsible for operating and maintaining computerized financial systems for RBG's manufacturing plants and program development groups. Over 400 financial analysts and managers count on the system to deliver timely and accurate information to their desktops.

In turn, Hunt's staff relies on Digital's VAX computer systems to collect, store and process that information.

The centerpiece of RBG's financial information system is a VAX 8600, which the group purchased in December 1985 to replace its two existing VAX systems. The system currently has 400 users, and is linked through DECnet and Ethernet networks to several other VAX systems and thousands of users at Xerox copier plants in Europe and Canada.

The system's users range from junior level financial analysts to departmental controllers, and all the way up to vice presidents. Most use a wide variety of financial planning and analysis applications that track new products under development or existing models already on the assembly lines. "And we are continually evaluating the software environment looking for new tools to aid in decision-making and productivity," says Hunt.

Departmental Processing

As for hardware, Hunt is sold on VAX systems. "The VAX 8600 has been performing extremely well," he says. "We find VAX/VMS a very easy environment to work with, and our users are very comfortable with it."

Hunt not-so-fondly remembers the old time-sharing data processing system that the group was using when he joined Xerox as a systems support person in 1979. At that time, bulky and inefficient hardcopy terminals were used to access an internal time-sharing system when, and if, it was available. Only the most complex financial applications were run on those precious computer resources. Small problems had to be worked out by hand.

But as computer technology became smaller and cheaper, Hunt began to recognize the potential of departmental processing. He and his first manager realized that a distributed computing environment, in which their group could control its own central computer, would best serve the needs of Xerox' financial analysts. And they convinced management to back their idea.

Hunt researched the relative merits of a handful of top computer vendors and began soliciting proposals in early 1980, just as Digital was introducing its new VAX-11/780 system. "The main emphasis initially was that the system had to be easy to run, reliable, and had to come from a vendor with a good track record," Hunt remembers. "At that time, the new VAX looked good from the standpoints of power, performance, footprint, flexibility, and the software that we could get onto it."

That first VAX system proved so successful that, within a year, the number of users nearly doubled and plans were made to upgrade to a more powerful VAX. At about this time, the group's European headquarters, based just outside of London, evaluated the system and quickly installed its own VAX equipment. Both the American and European operations have since moved up to VAX 8600 systems that now support hundreds of users and dozens of applications.

A Decision-Support System

"Right now we have many diverse uses for our system—from huge applications that take two hours for the VAX 8600 to compute, right down to a secretary running simple time-management for a group of managers," says Hunt.

The system's primary role, however, is one of decision-support for the group's financial professionals. The goal of Hunt's staff is to provide tools to help management better analyze current conditions and foresee future trends.

Although the Xerox tradition has been one of risk-taking and innovation, the company's phenomenal success in developing and marketing new products isn't mere guesswork. Careful planning, especially in financial matters, is crucial.

"We're under a lot of pressure to do more and more analysis because of the competitive market that we're in right now," says Hunt.

The group's financial planners and analysts produce an annual long-range strategic plan that maps out the future direction of the copier division, as well as numerous short-range operations plans that review the division's more current activities. These reports are compiled with the help of a variety of models and applications running on the VAX system.

Manufacturing specialists first attempt to anticipate the potential demand for all the division's products, along with the manufacturing costs and manpower requirements associated with building those products. If it is decided that, for example, a new product will succeed in its market, then further analysis will determine which one of Xerox' worldwide production facilities can most efficiently manufacture that product.

Research and development specialists also use their own models and applications. They contribute to the financial analysis process by determining how much capital is required to develop a new product, and



"Digital has continued to upgrade its computers, they've offered a nice migration path, and we've had no trouble whatsoever moving applications from one system to the other."

what the effect might be on the company's asset, liability, and overall profit-and-loss figures.

A strategic financial analysis is then conducted based on the data produced by the manufacturing and R&D specialists. Financial strategists consider potential sales—and the cost of those sales— for each of the division's products in every country or region where Xerox does business. These projections are made at copier plants around the world and are sent electronically through a DECnet link to RBG headquarters in upstate New York, where the information is compiled and processed for use by senior management.

The tangible end-product of all this activity is, in most cases, a printed financial report with accompanying charts and graphs. The graphic elements are important tools in the discussions and presentations that drive management decision-making. "We do a tremendous number of business graphs," says Hunt, "and that was one application that management really took to once they saw the capabilities."

The ability to produce effective charts and graphs was a major selling point in convincing management to invest in the original VAX system. And Hunt believes business graphics will become even more important as management seeks to reduce increasingly complex financial data to more easily understandable visual images. "Our goal," says Hunt, "is to get it on paper and get it on transparencies for projection."

In addition to financial applications, the group also uses Digital's ALL-IN-1 office automation software package to handle word processing, electronic mail, time management, and other office automation activities. There are currently 200 ALL-IN-1 user accounts on the VAX 8600 system, which is linked to a similar system at the division's European headquarters.

The PowerHouse Advantage

Another application currently running on the VAX 8600 is an inventory and shipping system that handles logistics for the group's internal supplies operation. The database system tracks the supply inventory and determines, as orders arrive, whether there is enough inventory to ship or whether supplies must be backordered.

Hunt's staff also created a database application that contains records for all of the group's computer equipment. The records include listings of user names, product serial numbers, and details for purchase, lease, and service agreements. The database helps the group track its own computer investments and plan future purchases.

Both the supplies and equipment database applications were built using the fourth-generation development language PowerHouse.* PowerHouse simplifies the job of writing programs and allows programmers to easily build models so applications can be tested while still under development. According to Hunt, PowerHouse has saved hundreds of man-hours in program development time.

"PowerHouse is flexible enough to allow remarkably fast prototyping development," he notes. "We really don't have time to perform a formal system analysis here, and some of our information requirements are extremely short-lived. That means we need to change our systems quickly. PowerHouse gives us that advantage."

With innovations such as PowerHouse, Hunt hopes his staff can handle the ever-growing user demands on their VAX system. But regardless of how much computing power he can offer, Hunt knows his users will find some way to stretch resources to the limit.

"That's one of the reasons we have Digital equipment here," he says. "Digital has continued to upgrade its computers, they've offered a nice migration path, and we've had no trouble whatsoever moving applications from one system to the other."

Hunt admits he has been surprised with the development of the VAX architecture since he purchased his first VAX-11/780 almost seven years ago.

"I don't think we really recognized the importance of the VAX concept until later, when more and more of the VAX systems arrived and as Digital expanded its product line around that concept," he says. "Now it's really become important to us." □

First Computer:
1962 (IBM Keypunch)
Used for:
inventory control

Order of Computer Usage:
(corporation totally computerized)
1 sales, order entry
2 distribution
3 financial; billing, accounting
4 inventory
5 personnel
6 forecasting
7 manufacturing; planning, buying, . . .
8 overseas and domestic connection

First Information System Installed:
(to control the confusion)
mid-1960's

Future Usage:
experiment with direct on-line ordering from sales offices



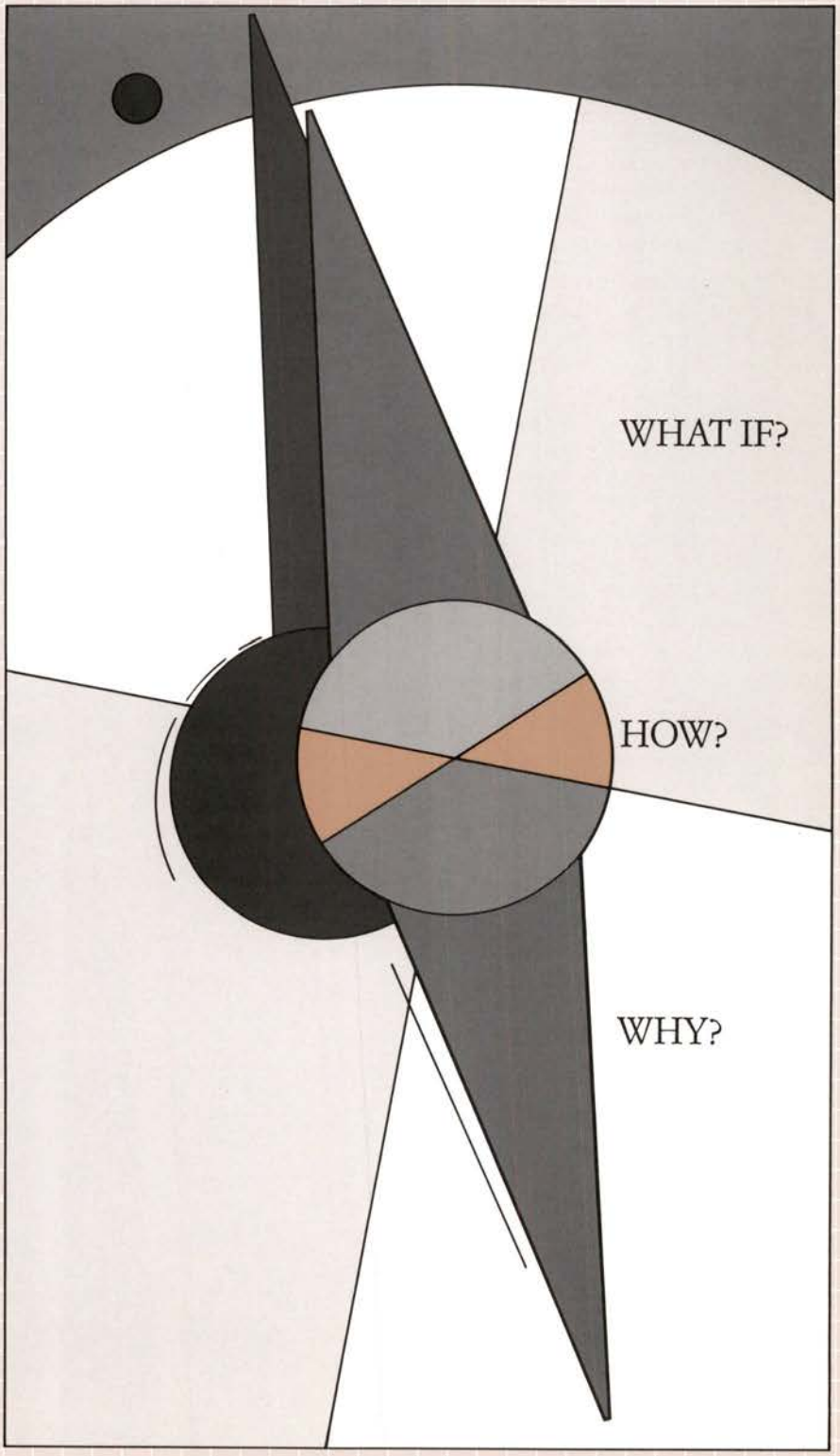
Willard C. Hunt

NEW

Digital is announcing that it has signed a cooperative marketing agreement with Execucom Systems Corporation of Austin, Texas. The recently signed agreement establishes a working relationship to promote the combined benefits of Execucom's financial planning/decision support software and Digital products and services through a series of domestic and worldwide ventures.

The agreement will focus on Digital and Execucom offering end-users within large organizations a variety of business productivity tools to help achieve financial analysis solutions.

Founded in 1975, Execucom has dedicated its resources toward helping decision-makers succeed at work. Its products have supported successful decision-making in such fields as manufacturing, energy, communications, finance, high technology, and government. In addition, the company's commitment to customer success extends from the boardroom to the classroom—more than 350 colleges and universities use Execucom's products.



Decision Support Software

Execucom's principal financial planning/decision support products, Corporate Decision Support System (DSS),* IFPS/Plus,* IFPS/Personal,* and Impressionist* are now available on Digital's VMS operating system and family of VAX and MicroVAX computers and is another strategic solution for the VAX-based Information Center, Digital's end-user computing environment.

The Decision-Making Edge

Execucom is the recognized leader in financial modeling. Its Corporate DSS and IFPS/Plus products are used at more than 1,500 customer sites around the globe. Over 200,000 people are trained in IFPS/Plus—making it the most widely used corporate planning solution in the world.

Corporate DSS supports the full spectrum of decision-making needs—from ad hoc analysis to complex, multilevel consolidations. From data management to proposal making. And from the desktop to the company mainframe.

Digital and Execucom fully recognize the wide range of business needs and the tools needed to support them. Many times, you're required to buy separate database management, information retrieval, statistical analysis, graphics, and ad hoc analysis packages. As useful as these tools may be, they're only part of the total solution.

Execucom's Corporate DSS is a software solution that covers the entire decision process and helps you excel in such areas as analysis, synthesis, and graphic presentation.

IFPS/Plus

The foundation of Corporate DSS is IFPS/Plus, a powerful business language that helps analyze problems in terms that everyone can understand. With IFPS/Plus, users can tap into all of their data sources, transfer information to and from the mainframe or departmental system, and exchange data with virtually any PC software tool—from spreadsheets to database managers.

IFPS/Plus also lets users manage vast amounts of information with a relational DBMS. Using the industry standard SQL-like language, users can create and query personal, departmental, and subject area databases and solve multidimensional, data-intensive problems with ease.

IFPS/Plus separates the management of databases, models, and reports. An application or report can use many different sets of data from multiple sources, and a single set of data can be used for many different applications and reports. Separating logic and data preserves the integrity of models and databases and simplifies the application development and maintenance process.

IFPS/Personal

IFPS/Personal brings decision support directly to the desktop. Used as a stand-alone micro modeling system or as part of a distributed planning network, IFPS/Personal is an ideal solution for improving corporate analysis and decision-making using personal desktop systems such as the VAXmate.

Since IFPS/Plus is a descriptive, nonprocedural language, statements can be entered in any order. This flexibility makes IFPS/Plus equally suitable for ad hoc modeling or developing complex applications of any business situations.

IFPS/Plus provides extensive analysis functions that support model building, interrogation, and problem solving. To simplify the modeling process, IFPS/Plus features more than 30 built-in routines for frequently used computations—such as rates of return, present values, and depreciation.

Impressionist

Impressionist supports the final phase of decision-making: making a proposal for action. Using Impressionist, the end user can present, with graphic clarity, the analyses completed by IFPS/Plus.

The menu-driven and easy-to-use Impressionist Chartbook offers a choice of over 100 preformatted charts and graphs, including bars, pies, lines, scattergrams, and word charts.

With the Graphics Editor, users can add, delete, insert, replace, rubber-stamp, sort, fill, color, move, scale, rotate, zoom, and modify any image, as well as merge text and graphics on the same page. The Graphics Editor also supports free-form drawings of company logos, pictographs, organizational charts, maps, and other images.

Basic Graphics controls such basic charting functions of Impressionist as drawing charts, retrieving data from spreadsheets, or driving plotters and printers. Complex charts such as bubble graphs, Gantt charts, and logarithmicaxes are easily drawn as well.

Matching Philosophies

By coupling the capabilities and flexibilities of the VAX/VMS family of computing products and services with such quality business productivity tools as IFPS/Plus and Impressionist, Digital and Execucom are now better positioned to provide business professionals with the resources to make more knowledgeable, informed, and intelligent decisions.

This Cooperative Marketing Agreement is an ideal match of corporate philosophies. Execucom has a consistent track record of providing financial planning and decision support solutions to an array of Corporate Information Centers, financial marketing organizations, and Information System departments. These solutions, combined with Digital's growing presence in the commercial business sector, creates a significant leap into the future for both companies.

One of America's foremost "think tanks" on war, revolution and peace

THE HOOVER INSTITUTION



Dr. John Raisian

"We stressed price and performance when searching for our computer system. Our recent transition to the VAX 8650 has been exceptional and, so far, user response has been quite favorable. Although our scholars and staff are still getting comfortable, they're very enthusiastic about its potential."

Ever since high-tech joined American business circles, its subsequent successes and failures have often been determined by the energies directed toward research and development. For the past three decades, it has been within this all-important discipline where corporate decision-makers have spent billions of dollars creating and nurturing the cornerstone of their companies.

However, the field of research certainly did not commence with, nor is it confined to high technology. Its origins can be traced back thousands of years, when scholars-of-the-day and other members of the academic, political, social, and religious communities began laying the foundation for future generations through their dedication to research and dissemination of knowledge.

The time-honored tradition of scholars dedicating time to extensive research projects in a working environment conducive to discussion and collegiality exists today—at one of America's foremost "think tanks," the Hoover Institution on War, Revolution, and Peace.

In the heart of the sprawling Stanford University campus in Palo Alto, California, internationally recognized scholars pursue independent research on a wide range of intellectual concerns—from theoretical questions within various disciplines to problems of public policy in international, domestic, and national security affairs.

Hoover Institution is also home to a recently installed Digital VAX 8650 computer system that's helping scholars and staff members streamline qualitative and quantitative research projects in an easy-to-access document processing and statistical computing system.

Extraordinary Record of Public Service

The Hoover Institution is a leading center for advanced study in domestic and international affairs and public policy. Founded by former United States President Herbert Hoover in 1919, it contains one of the world's largest private archives and libraries focusing on political, economic, and social change in the twentieth century, as well as a major scholarly press.

Symbolic of the Stanford University campus is the landmark Hoover Tower. The 275-foot monument and two adjacent memorial buildings house the Institution's scholars, a library containing over 1.6 million volumes, and an archive consisting of more than 4,000 collections. In addition to Stanford students, faculty, and resident staff, the materials in the library and archives attract scholars from across the country and overseas. Original source materials are included in the Institution's specialized collections that focus on Africa and the Middle East, East Asia, Eastern Europe and the Soviet Union, Latin America, North America, and Western Europe.

Hoover scholars in the Domestic Studies, International Studies, and National Security Affairs programs are involved in research on a wide range of economic, social, and political issues. Collectively, scholars associated with the Institution

To facilitate information-processing a computing services group within the Institution assists scholars and staff members.

hold 45 memberships in the nation's leading honorary societies, six Nobel laureate awards, Presidential Medals of Freedom, the Congressional Medal of Honor, and the National Medal of Science.

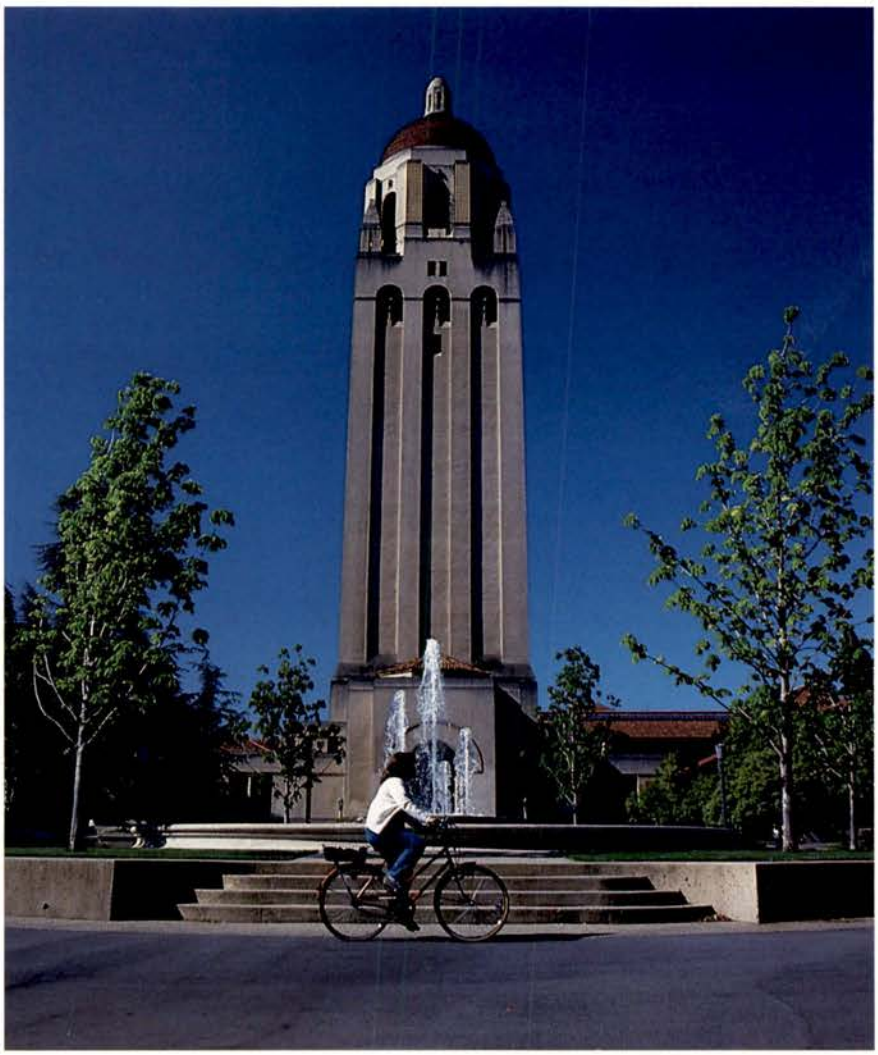
Research results are disseminated through a variety of channels: seminars, conferences, books, journal articles, lectures, and interviews. Articles by Hoover scholars appear daily in major North and South American newspapers. In addition, Hoover scholars provide expert congressional testimony, serve as consultants to governmental agencies, and engage in an array of other public service activites.

The amount of paperwork generated by research-driven investigation is quite significant. To facilitate information-processing in record time and eliminate the traditional "paper blizzard," a computing services group within the Institution assists scholars and staff members with their growing automation needs.

Enhancing the Intellectual Climate

"Since the Institution is in the business of research, it's the responsibility of our computer services group to provide scholars with the necessary resources to accomplish quality research," states Dr. John Raisian, Hoover Institution associate director and senior research fellow. "One of those 'necessary resources' is computing capability. We must offer researchers, their assistants, and the support staff an automated system that can eliminate the traditional paperwork and still handle modeling, simulation, and statistical computing tasks—utilizing extensive social science databases."

Such a resource is now available from the newly installed VAX 8650. With it, the Institution's management is providing approximately 240 Hoover staff members an opportunity to learn and use a unified system. The results? A significant increase in computer power. Eventual compatibility with personal computers. And fewer headaches.



The landmark Hoover Tower is home to one of the world's largest private archives and libraries on politics, economics, and social change.

"The Institution has been using Digital computers since 1979," notes Raisian, who recently arrived at Hoover with past experience as an academic economist, a federal government policymaker, and private consultant. "Users really liked the older VAX systems we were using, but as we pushed its capacity to the limit, we knew it was time to switch our growing automation needs to a more powerful system— particularly in the document processing area.

"Management was hesitant at first about the type of system that was appropriate,"

"We expect to have a unified system—while integrating IBM-compatible PC architecture within the system."

he adds. "Did we want a decentralized PC-oriented system or one that was larger and unified? After comprehensive deliberation, we decided that Digital was best suited to meet our global needs today—and more importantly—in the future. We projected that the choice of Digital offered both of the major elements.

"We expect to have a unified system capable of handling small and large word processing and statistical tasks—while integrating IBM-compatible PC architecture within the system. At the Institution, we invite many scholars to visit for extended time periods. The provision of a system that is friendly to their needs is an important consideration to us."

Today, nearly every person at the Hoover Institution can access the system from their desks via Digital VT terminals. Raisian says, "With the VAX, we know that, even if we decide to upgrade to a bigger system, we won't have to spend time re-educating the user. There's no reason to dedicate a large chunk of their valuable time to learning new systems. They've got more important things to do.

Entering the Next Phase of Computing

Raisian, his computer services group, and other personnel at the Institution recognize that the VAX 8650 can do a lot more than document processing. Statistical and modeling application programs have been added to the system to support the ongoing policy research at Hoover. These features are enabling Hoover analysts to perform their research with accuracy and speed.

The Institution has also hired William Bonnett as its system manager. Bonnett has extensive Digital computing experience and serves as secretary of the local area Digital Users Society, DECUS. His immediate task is to tailor the system to Hoover's specific needs.

Stanford University boasts exceptional departments and professional schools in the humanities and sciences and has utilized Digital computing resources for many years. Most departments and colleges within the university have installed Digital equipment—not only to help educate undergraduate and graduate students, but to manage individual business, research, and development needs.

The Digital-Stanford relationship is interactive. Both organizations have made significant contributions to joint research and development projects. The expanding relationship between Digital and the Hoover Institution is indicative of the broader Digital-Stanford relationship.

"No doubt about it," John Raisian replies. "We're ecstatic about the way things have gone in our recent changeover. Because of the upcoming conversion to the new system, there was some early apprehension. But it was short-lived. I see a number of positives forthcoming from Digital, and I feel we're very much in position to take advantage of them."

Cementing a Commitment

The Hoover Institution is working in partnership with Digital. There have been no regrets about the decision to install the VAX 8650 and its associated resources. Dr. John Raisian predicts many future opportunities for the system to demonstrate its diverse MIS capabilities. He concludes, "With the expansion of computer capabilities in recent years, it's no mystery that scholars have acted quickly to take advantage of their productivity-enhancing potential.



Herbert Hoover, President of the United States, 1928–1932

"We want to offer Hoover scholars a computer system that is unified, friendly, and communicative. The indications I get from product announcements suggest that Digital is preparing products that will have significant IBM compatibility and interfaces. That's a very positive sign for us. Many of our scholars use IBM-style personal computers. The Digital movement towards having IBM linkage will allow us to unify the research activities of both our resident scholars, as well as the many visiting scholars who are invited to the Institution.

It's this type of foresight that has delivered the Hoover Institution and Stanford University to the top of academic, political, and economic circles. □

First Computer:
1979 (VAX-11/750)
Used for:
statistical software and word processing

Order of Computer Usage:
1 word processing
2 statistical computing
3 personnel
4 accounting

First Information System Installed:
1986 August

Future Usage:
experiment with computerizing library activities

WINTER 1987

enterprise

INFORMATION SYSTEMS JOURNAL

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