

## TAKING CHARGE

Eric K. Clemons

### Strategic necessities



There continues to be much interest in the strategic and competitive uses of information system applications, as evidenced by articles, conferences and executive education enrollments. Much of the hype — the excessive claims and unrealistic expectations — that characterized work in 1985 and '86 seems to be fading. Most firms have more reasonable expectations for their information systems ventures. In addition, more is now known by academic investigators and corporate decision makers.

Our research during the past four years has led us to formulate the strategic necessity hypothesis, which says that many, if not most, strategic applications of information systems have proven to be strategic necessities. That is, regardless of the system developers' original intent, most strategic information systems have not been a source of lasting competitive advantage. Rather, they have become new essential aspects of doing business. Getting them right merely yields parity; getting them wrong may force you out of the game.

This hypothesis, if true, has policy implications both when evaluating a potentially com-

## The Feds' dynamo

Exec is salesman, motivator and life of the party

BY MITCH BETTS  
CW STAFF

ALEXANDRIA, Va. — Joseph J. Leo, a senior manager at the U.S. Food and Nutrition Service, is trying to modernize the information systems that support \$20 billion of the nation's most critical services, including the food stamp, welfare and school lunch programs. He doesn't have much time for vendor hype.

At a symposium on federal systems in December, Leo listened to some lofty sales pitches and then took the podium to deliver a withering critique. "Give me a migration path," he told the vendors, with characteristic bluntness. "I have to manage in three different worlds: the past, the present and the future."

Later, in an interview, Leo smiled and said, "The vendors will tell you that everything is possible when, in reality, it's not."

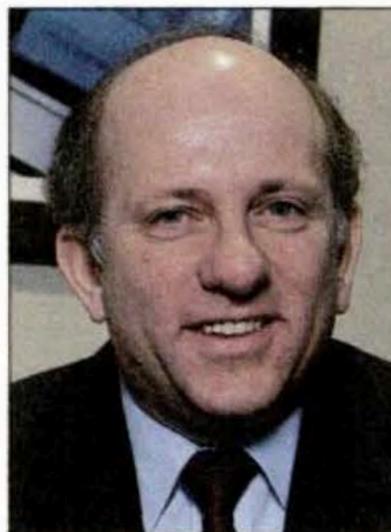
### Tough stance works

Although Leo is tough on vendors, he is also known as a tough manager at the Food and Nutrition Service, part of the U.S. Department of Agriculture. As deputy administrator for management, Leo is in charge of an odd assortment of offices: information systems, personnel, civil rights and administrative services. In addition, he serves as chairman of a special committee that provides guidance to all 50 states on the use of computer systems for public welfare programs.

"He's definitely a tough manager," says his boss, Anna Kondratas, administrator of the

## PROFILE

Joseph J. Leo



BRUCE HOERTEL

**Position:** Deputy administrator for management, U.S. Food and Nutrition Service.

**Mission:** Running a tight shop, selling programs, motivating by communicating excitement, charting the future.

agency. "But that's positive from my point of view, because he runs a very tight shop," she says, noting that the agency's systems modernization program is well coordinated and running smoothly.

Leo likes to keep his workday down to 10 or 12 hours — "one step short of being a workaholic," he says — and spends his free time with friends, his sports car and planning an upcoming trip to Europe. "My generation grew up with the adage: Work hard, play hard," he comments.

Along with an occasional outburst of temper, Leo is known for having a high energy level and extraordinary enthusiasm for his work, according to Kondratas. In fact, for years he has

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## BOEING COMPUTER SERVICES

### Channeling the information stream

BY DAVID A. LUDLUM  
CW STAFF

With 45,000 workstations or terminals, 450 minicomputers, 54 mainframes, supercomputers and its development of communications standards, Bellevue, Wash.-based Boeing Computer Services Co. (BCS) is conspicuous among large and innovative users of information technology.

And with more than 1,500 customers in government and industry, many desiring systems integration, the computer services division of The Boeing Co. is also a prominent example of the potential for such users to sell products and services to other companies.

But BCS, which centralizes most major systems activities at Boeing, has also been making strides in other realms of the management of information technology, such as controlling costs, supporting corporate strategy, educating personnel and keeping abreast of new technology.

Like the commercial MIS arms of most aerospace firms, BCS, whose earnings are not made public, makes a negligible contribution to its parent company's bottom line, according to Paul Nisbit, an aerospace analyst with Prudential-Bache Securities, Inc.

However, BCS's commercial activities seem to offset the costs and expand the capabilities of its internal services, Nisbit says. "Undoubtedly, they've streamlined their engineering and manufacturing processes due to the very sophisticated systems in place internally," he says.

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Such accomplishments come in response to major upheavals in Boeing's business environment. Airline deregulation and new competition from the European consortium Airbus Industrie have put downward pressure on the prices Boeing can charge for its commercial aircraft.

Among Boeing's responses has been the firm's adoption of Japanese-style "design/build teams" — an effort to boost efficiency and cut costs by coordinating designs more closely with manufacturing requirements and budget constraints.

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# Channeling

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The teams include design engineers, material specialists, manufacturing engineers and BCS information systems professionals.

"Coordination of that kind is best handled by an information system," says Del Rowan, assistant to the president at BCS. "To do that, obviously you need the information systems people." Rowan emphasizes that Boeing is revamping production processes before automating them. "It does little good to take

a manual system that has been in place and simply automate it," he says.

### All for one

In a speech last fall, Robert Dryden, then president of BCS, described the team approach as part of a breaking down of organizational barriers that is accompanying an effort by Boeing to streamline processes around a flow of digital information.

In other efforts to boost efficiency, BCS has implemented advanced systems for design, engineering and manufacturing as well as for cost analysis of design options.

Airline deregulation, along with volatile prices for jet fuel, has also placed a premium on flexibility in Boeing's production. BCS has helped address that need with design and manufacturing data bases that accommodate production of various models of a basic aircraft design and with systems for scheduling and manufacturing resource planning.

In his speech, Dryden, who was succeeded by longtime IBM marketing executive Michael Hallman after being appointed president of Boeing Military Airplane Co. last fall, stressed that much of Boeing's production is essentially information processing.

"Our vision of what we want this process to become is that of an enhanced information stream," Dryden said. "What we are doing to implement that vision is rebuilding the company around the concept of that enhanced information stream."

Sharing information has enhanced Boeing's customer service by allowing documentation to be based on original design and manufacturing data, according to Dryden. BCS has also supported customer service with systems for worldwide tracking of spare parts inventories and for troubleshooting with artificial intelligence.

### Enhancing skills

The development of AI technology has been a major thrust at Boeing since the early 1980s, when the U.S. Air Force advised contractors to pursue it and a company task force concluded it was crucial to Boeing's competitiveness.

But the company found itself with a demand for AI experts at the master's degree level that far outstripped the available supply, according to Bruce Wilson, BCS's chief scientist for computing technology. The company

program, which takes students in groups of about 10, involves six months of prototype development and an optional, introductory half-year of training. The first class graduated in February 1985; since then, the program has produced 68 alumni. "The labor costs are on the students' own organizations, so they tend to pick good people," Wilson notes.

One fruit of the program is Boeing Electronics Co.'s Connector Assembly Specification Expert, an expert system for helping workers assemble electrical connectors. It provides a printout of assembly instructions, avoiding the need for workers to search hundreds of pages of documentation. The firm says the system, which runs on a Digital Equipment Corp. Microvax, should save Boeing \$10 million per year when it is fully deployed.

Through its Education and Training Division, BCS has ex-

tended its AI instruction to others, including employees of a group of Japanese companies, through a joint effort with the Tokyo trading company Nissho Iwai. The Skill Enhancement Program will be extended to include training in high-speed computing and perhaps other areas, Fennell says.

The Advanced Technology Center also strives to keep BCS abreast of the latest technologies. It oversees Boeing's relationship with the Carnegie Group, Inc., a Pittsburgh firm specializing in the application of AI to manufacturing and engineering in which Boeing has purchased an equity stake.

The center also runs programs that bring scientists and researchers to Boeing for one- or two-day colloquiums or visits that last several weeks, during which they consult and lead seminars, an undertaking Wilson calls the "rent-a-professor" program.

## At A Glance

### Boeing Computer Services

Founded: 1970  
 Employees: 11,000  
 External revenue: \$361 million  
 Boeing support costs: \$620 million  
 Equipment inventory: \$1.06 billion  
 Mainframe processing power: 750 MIPS\*  
 Computer vendors: More than 30, including IBM, CDC and Cray Research  
 Data centers: Six — Washington (two), Kansas, Virginia, Pennsylvania, Alabama  
 Network: Nine control centers; manages more than 12,000 data circuits nationwide  
 \* Millions of instructions per second

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ported customer service with systems for worldwide tracking of spare parts inventories and for troubleshooting with artificial intelligence.

### Enhancing skills

The development of AI technology has been a major thrust at Boeing since the early 1980s, when the U.S. Air Force advised contractors to pursue it and a company task force concluded it was crucial to Boeing's competitiveness.

But the company found itself with a demand for AI experts at the master's degree level that far outstripped the available supply, according to Bruce Wilson, BCS's chief scientist for computing technology. The company estimated it needed "about 150 trained folk" but could only bring about one on board every two years, Wilson says.

That led BCS to launch its Associates Program in 1984 — recently renamed the Skill Enhancement Program — which is run out of its Advanced Technology Center for Computer Sciences, a 5-year-old facility aimed at acquiring and developing technology and disseminating it to Boeing operating companies.

The Skill Enhancement Program is aimed at cultivating AI know-how within Boeing and fostering the application of AI to procedures and products. It provides graduate-level training to experienced software engineers from the Boeing companies.

"It's a transfer mechanism for allowing us to move the technology evolving inside the center out to the operating companies," says David Fennell, manager of the program.

The Skill Enhancement Pro-

Founded: 1970

Employees: 11,000

External revenue: \$361 million

Boeing support costs: \$620 million

Equipment inventory: \$1.06 billion

Mainframe processing power: 750 MIPS\*

Computer vendors: More than 30, including IBM, CDC and Cray Research

Data centers: Six — Washington (two), Kansas, Virginia, Pennsylvania, Alabama

Network: Nine control centers; manages more than 12,000 data circuits nationwide

\* Millions of instructions per second

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# COMPUTER INDUSTRY



# COMPUTERWORLD

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**Object-oriented data** management systems will move up to the mainframe world. **Page 25.**

**The System/36 will live to**

## IBM opens data trove to E-model users

BY CHARLES BABCOCK  
CW STAFF

NEW YORK — IBM is launching a new mainframe operating system that builds on its MVS/SP and MVS/XA lines and offers users an 8,000-fold increase in the

virtual memory available for data.

Enterprise Systems Architecture/370, announced here last week, offers a number of innovations that IBM said can be used only by its top-of-the-line, 3090E mainframe buyers. Users

of 3090Es as well as Amdahl Corp. and National Advanced Systems Corp. mainframes predicted that the plug-compatible manufacturers will find it difficult to quickly duplicate the architecture.

The new features include use of expanded storage as a dedicated direct-access storage device inside the CPU, an expansion of virtual memory through a hardware and software innovation called data spaces and data windowing services that allow application users to scroll through large virtual data sets.

Although large IBM customer sites predicted an eventual need for these features, many

managers last week said they are in no hurry to experiment with the operating system until IBM lays out future hardware plans (see story page 112).

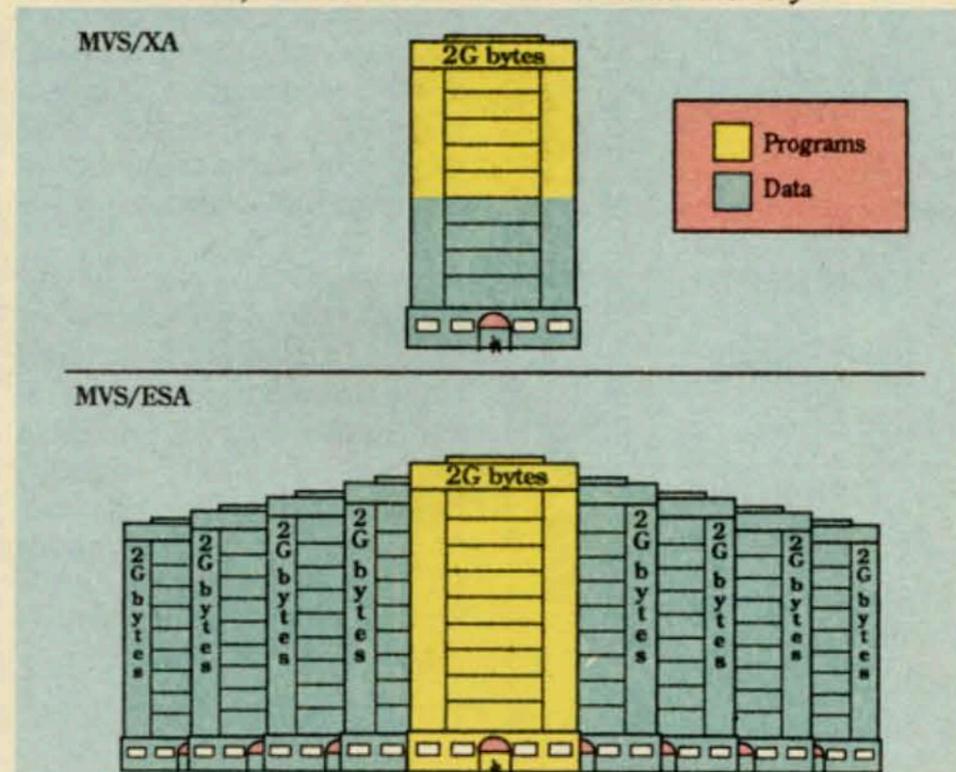
Staged delivery of the operating system reportedly will begin in August, with added functions shipped as upgrades before the end of the year.

Existing applications, particularly large IMS applications, are supposed to run 10% to 12% more efficiently under ESA/370, said Carl J. Conti, vice-president of IBM's Enterprise Systems unit. Some batch processing could even show a performance decrease of 3%, the customer

*Continued on page 112*

### Change of address

*MVS/ESA duplicates the 2G bytes of memory addressable under MVS/XA but can address 8,000 times as much data in virtual memory*



CW CHART

## Pay issue: Women pull

professions surveyed do better than women in other industries in approaching the pay level of their male colleagues, earning 79% as much as men in comparable positions. That compares

## Mainframe shifts gears

BY JAMES CONNOLLY  
CW STAFF

### ANALYSIS

The mainframe — whose critics portray it as a dinosaur helplessly watching the skies for a cataclysmic meteor shower — is being adapted for a new role by its biggest advocate, IBM.

With an eye on the proliferation of powerful workstations and distributed processors that can run user applications, IBM reinforced its effort to redirect

3090 and future mainframes.

The word "enterprise" and the concept of sharing information throughout a corporation were focal points for executives in IBM's Enterprise Systems unit at last week's announcement. The minimal applications orientation focused on how the 3090 and the system software will support distributed user applications that require massive amounts of storage and, for technical computing, the 3090's vector processor.

MVS/ESA was designed to support 16 terabytes of memory