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**TOMORROW THE WORLD**  
Control Data Programs the Future



# TOMORROW THE WORLD

Control Data, a multi-national super-computer maker, is out to save small business and the family farm. Why? Because at CDC, a world saved is a profit earned.

By D. J. Tice

**T**hree burly men labor in the hot sun, chipping rhythmically, endlessly at a great mound of granite. A stranger stops to ask what they are making. The first man shrugs and replies, "I'm making big square blocks for the wall of a church." The second answers, "I'm making \$5.27 an hour." The third worker scratches his head, smiles and offers: "I'm making a great edifice to the glory of God!"

At Control Data Corp., Bloomington's adventurous computer giant, the employees like to think of themselves as resembling that third worker. In fact there are resemblances—the gift for hyperbole not least among them. But beyond this, Control Data views itself as a company that, like a visionary stone mason, sees beyond the mundane details of the task at hand and focuses instead on the cumulative, glorious end result.

In Control Data's case, the awaited end result is not the delivery of sophisticated computer systems, nor of computer cycles, nor of bits and bytes

and disk drives, but the delivery of knowledge, nothing less. Says Robert Chinn, senior vice president for strategic programs and assistant to the chairman: "If you were to ask me what business we're in today, I'd say the knowledge-services business. The biggest requirement of the future is going to be for knowledge."

Adds Robert Duncan, president of CDC's Data Services Co.: "I view a lot of the opportunities in 20 years as being in the medical area, energy conservation and agriculture, because in 20 years those aren't going to be minor media problems; they're going to be here in spades. And the most crucial problem in each of those areas is the distribution of knowledge. I see Control Data and in fact the whole computer industry going into the knowledge business. If you stay in the computer business you're going to be in the buggy-whip business in 20 years."

Now, the knowledge market may seem a trifle unwieldy, a bit hard to define. You will be forgiven for doubting the seriousness of these statements, since a comprehensive strategy to ad-

dress the future's requirement for knowledge would surely send a company sprawling across the economic landscape in utterly unmanageable configurations. But before you scoff at Control Data's sincerity on this matter, consider the following:

- Control Data, a company that has made its reputation designing and building the world's largest, fastest scientific computers, has, at this moment, through a consortium called Rural Venture, a team of agricultural experts tramping across the Arctic tundra near Selawik, Alaska, trying to help local eskimos grow potatoes in the permafrost.

- This same company, which specializes in data-processing services for the most complex scientific and engineering problems, has dispatched medical vans to the Rosebud Indian Reservation in South Dakota, where its medical teams wander about providing services and training in "wellness" and nutrition. Asked to clear up the confusion as to how Control Data will earn a profit from this adventure, Lee Kremer, vice presi-



CDC's three-headed corporate executive office: Robert Price (seated), Norbert Berg (left) and William Norris.

dent for health care services, responds: "To be very honest it confuses me too."

● Control Data, the fourth largest computer firm in the United States, a colossus with 58,000 employees in 47 countries, the seventh largest corporation in the ninth Federal Reserve District, number 159 in the current *Fortune* 500, with around \$3 billion in revenues for 1980, never tires of preaching the "small-is-beautiful" theme. CDC has adopted an aggressive strategy to aid small businesses (as well as small farms) because, says chairman of the board

and chief executive officer William Norris, small business is the seat of creativity, the seat of innovation, the creator of new jobs. "You can see the counterpart in small nations," he adds. "Israel, for example, is a very creative nation. Why? Because they've got their butt up against a wall! The same thing is true in small business. You've got to create to survive."

**C**ontrol Data's small business programs, like its involvement in health and agriculture, reflect a long-standing and passionately pro-

moted corporate strategy to "address the basic needs of society as profitable business opportunities." Perhaps more important, such ventures conform to CDC's belief that the brightest future lies not in computers themselves, but in computer *services*—that is, in delivering not a tool but a final result.

Says Robert Price, president and chief operating officer: "Control Data is in the business of knowledge services. We're a vertically integrated service company. The way we've grown up is that every part of the business tends to be viewed as a business in its own right. Peripheral products are sold to original

equipment manufacturers (OEM). Computer systems are sold as systems. But all of those things are used to deliver services as well."

The virtue of the services business, according to Price, is the value that has been added to the final product the customer receives. "As you combine products to build a computer system," he says, "you have a higher level of value added than there is in just building the mainframe. When you add applications programs to a computer system you get still more value added. Instead of delivering a tool to help someone write speeches, you deliver a speech-writing machine.

"When you take this and actually operate the system for him, and you deliver to him the result of the computations as opposed to the system itself, then that is what's called a data service or an education service or a knowledge service. The basic characteristic to understand is that adding value to something takes time and money. It does require front-end investment, but we're prepared to do that because once you get there you have something that creates barriers to competition. The more value we have added, the more things that belong to us, the harder it is for competition to come in and take a market away.

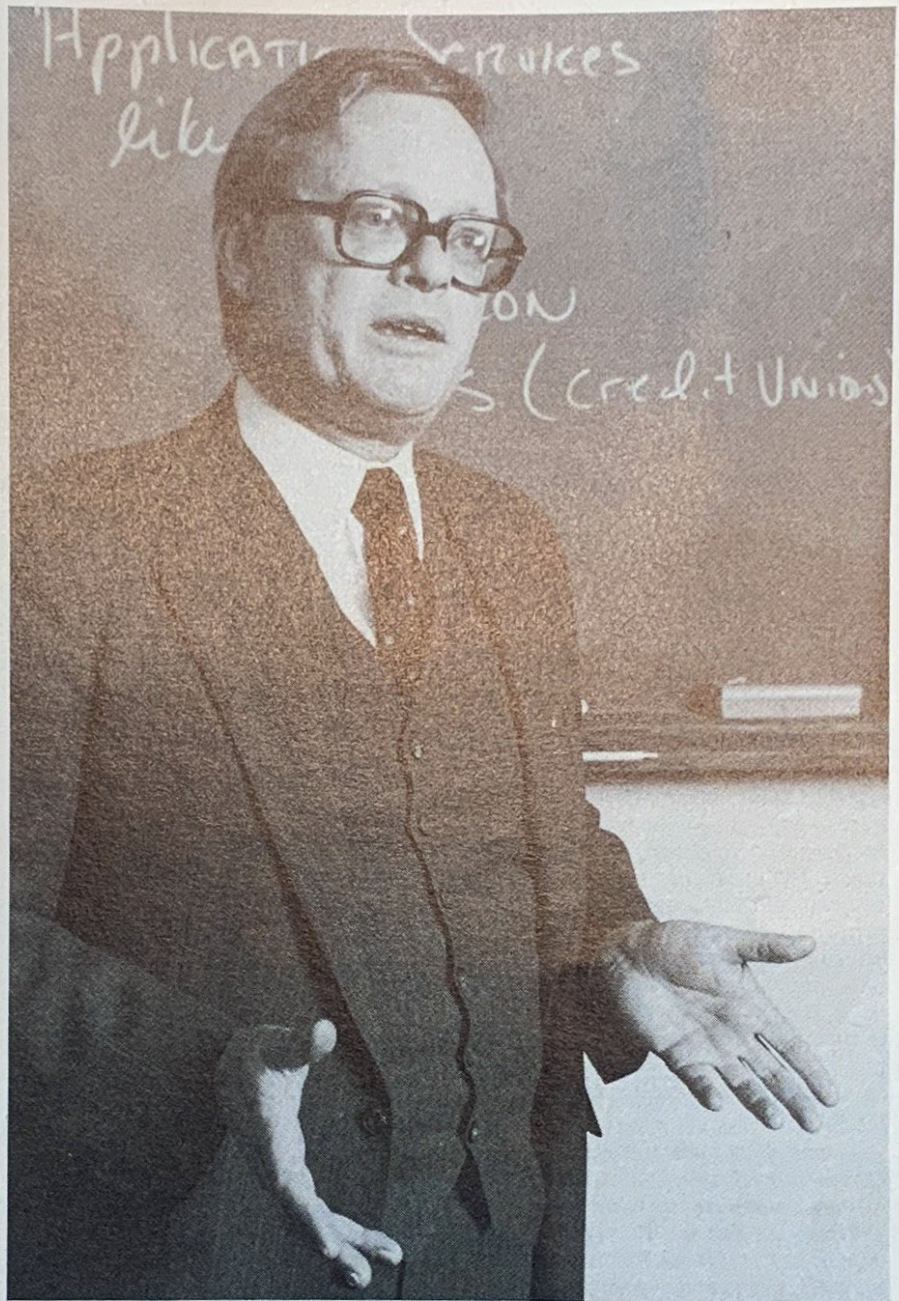
"If you just go back to raw technology and look at all the companies fighting over the new semi-conductor chips, you see a very tight technology race. When you look at value added you see a different problem: You have to be patient; you have to be willing to wait for the long term. But once you get there you have something."

Today Control Data has something—the world's largest data services company, with services accounting for nearly 40 percent of the corporation's computer revenues. Within five years, according to Price, services should produce well over half of those revenues.

"Control Data has followed a basically different strategy from the other mainframe computer companies," says Price. "Most of the others stop at building computer systems. And although everyone talks about applications, no one else has really dedicated themselves to delivering services.

"Clearly our decision to move into services has been successful. It's providing stability to the company that even I wouldn't have expected. It's difficult to imagine what we would be like if we were strictly a hardware company today."

Difficult, perhaps, but by no means impossible. Prior to the mid-1970s, when the services business began to mature, Control Data was largely, if not strictly, a computer hardware company, and it was unquestionably a company with problems. Throughout the 1960s and early 1970s the corporation suffered



Jim Majerus

Data Services Co. president, Robert Duncan

from what has been called "the four-year syndrome," recording substantial losses in 1962, 1966, 1970 and 1974.

Those losses can be attributed to a number of causes, including the heavy investments CDC was making in developing its service capabilities, ferocious competition from IBM and what Robert Price terms "the absence of a cash cow"—that is, a traditional business with which to fund the computer effort, something every other contender, except IBM, enjoyed.

But dependence on the mainframe computer market was certainly the company's most fundamental problem. Says Norbert Berg, deputy chairman of the board: "We were a little like a one-legged stool. When something came along that affected the market we were really vulnerable. When we had internal

problems, with a technological breakthrough or the lack of one, and our product delivery slipped we got clobbered. Like many small businesses we were sure that we were putting other legs under the stool, but our businesses were young and much more vulnerable. We had nothing to fall back on."

That, certainly, has changed. Today Control Data lays claim to being not only the world's largest data-services company but also the world's largest independent supplier of peripheral equipment (memory disks, printers and the like). Together, these two segments now account for nearly 80 percent of the company's computer revenues, prompting Tom Niemiec, a research analyst with Piper, Jaffray and Hopwood to assert: "It's very difficult to compare Control Data with other computer com-

panies. They're not really a computer company."

Maybe so, but Control Data's recently announced Cyber 205 is the world's fastest computer, performing 800 million operations per second. There is no company, in any event, with higher hopes for what computers can do.

It is far too early to judge the ultimate importance of the digital computer. The technology celebrates only its 35th birthday this year. But it seems already clear, from the explosive growth of the worldwide computer industry and even more from the pace of technological advance (computer industry spokesmen are fond of saying that if the auto industry had lowered the cost of its product as fast as has the computer industry, new Cadillacs would now sell for less than \$100) that the computer's potential is virtually unknowable, if not unlimited.

Certainly no one at Control Data Corp. sees any limit to the applicability of the computer. The computer, they will tell you, can store, process and deliver information (read, "knowledge") and because the usefulness of information is universal, so is the computer. The belief that computing power can be profitably applied to literally any problem underlies Control Data's emphasis on services and software as well as its contention that wherever there is a basic human need there is a potential market for a computer company. "People talk to us about market research," says Norb Berg, "and we say, 'Pick up the newspaper.'"

The range of data services now being delivered by Control Data—at a profit—lends some credence to these claims. Through its Service Bureau Company (SBC) Control Data offers conventional business data processing services to some 7,500 customers. Through its CYBERNET Services, CDC now offers remote scientific and engineering data processing on six continents. CYBERNET has a standing library of some 200 applications programs, broadly divided into six industry categories—manufacturing, mining, petroleum, construction, utilities and government.

In the petroleum field, CYBERNET offers applications in "seismic processing" and "reservoir engineering" (in more humane language, programs that aid in the discovery and efficient extraction of oil). For architectural engineers there is *Blast*, a program that can simulate a building, with all its parameters, on a computer terminal, and then analyze the proposed structure's energy requirements. *Relap* simulates a nuclear power plant, testing steam pipes and other structures for stress endurance. *Cyberman* would seem to go the final yard, simulating a human being who can be placed inside an

automobile under design to see how well he fits, and where, for example, radio knobs might best be placed for his convenience. But CYBERNET even offers programs which aid in the design of other computers.

"We now use computers to design computers," says Lloyd Thorndyke, senior vice president for research. "We never did this before, but now we need this generation to design the next."

Control Data also markets what it calls "specialized data services." These include *Arbitron*, the world's largest radio and television ratings system. The Nielsen company is better known since it handles TV network ratings, but *Arbitron* has reached further into the broadcasting market, providing small stations with computerized planning and control systems.

Next comes *Ticketron*, a nationwide computerized box office. Through any of *Ticketron's* 1,000 remote terminals,

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**"People talk about  
market research.  
We say, 'Pick up the  
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tickets for a wide variety of sports and entertainment events can be purchased—and the purchaser's seat selection recorded—at the push of a button.

Add to these *Cybersearch*, a nationwide computerized employment agency, and *Technotec*, an international technology exchange service, and you begin to see the sprawling dimensions of Control Data's services business.

Still, Control Data does not take its leadership position in services for granted. Says James Murdakes, who heads CYBERNET Services in the U.S.: "The challenge for the next 10 years is that the big guys are going to jump in. This is a good business to be in. Xerox, AT&T, IBM, they're all going to jump in.

"Our competitors all have similar equipment," Murdakes continues. "The operating systems are 95 percent identical. The applications are about 90 percent identical. You're left with people. To the extent we can make our people better than the competition at solving the customer's problems, we'll be that much further ahead."

No future need seems as critical—or as profitable—to Control Data officials as the need for improved education. Over the past 18 years CDC has invested more than \$600 million in the development of a sophisticated computer-based education

system dubbed PLATO. The system has yet to turn a profit on that investment, not so much because revenues have been lacking (PLATO produced \$62 million in revenues in 1979), but because Control Data has steadily plowed the money back into the system, developing to date some 7,000 hours of courseware.

The PLATO system was originally developed at the University of Illinois. In 1962, the college invited industry participation in the system's further development, and Control Data, alone, jumped at the opportunity. Why? "Because," says Bill Norris, "the computer will ultimately pervade every aspect of education, and education is going to be tremendously benefited as a result. Computer-based education is going to shut off this stream of kids coming out of our high schools without basic skills. It's just going to shut it off. Furthermore, you're going to see dramatic benefits in education in developing countries as a result of the computer."

PLATO already has gone international, in Canada, the United Kingdom, Belgium and South Africa. PLATO systems are in use in at least a dozen universities, both in the U.S. and abroad. In addition, PLATO services are available through a coast-to-coast network of 22 Control Data Institutes, which offer training in computer programming and maintenance, and in 85 Control Data Learning Centers, which provide the full range of PLATO courseware.

That range covers everything from basic reading and math drills to complex simulation training for cardiologists and aircraft pilots (American Airlines has used the system for this purpose, apparently with good results).

Control Data makes weighty claims for PLATO, among them that adults taking remedial basic-skills courses often advance a full grade level in reading or math in less than 30 hours with the terminal. This claim may prove difficult to substantiate, and careful objective testing of PLATO's performance is still in the preliminary stage. One such test, however, at an inner-city school in Baltimore has shown significantly higher achievement levels for students using PLATO when compared to the city-wide population of students of the same age.

PLATO's most often cited virtue is the fully individualized instruction it provides. The computer gives each student its undivided attention—something few human instructors can offer. The student is regularly tested, and PLATO can instantly review any material with which he or she is having difficulty. In one PLATO course for young children, the student simply touches the terminal screen to construct sentences from the words printed out by the computer. When a grammatically correct sentence is written, PLATO congratulates the student and animates the sentence. In

another basic-skills course, PLATO takes the student to "Daytona Beach," where a simple mathematics drill (rather like the old flash cards) becomes a miniature stock-car race, complete with sound effects.

A far more advanced chemistry lesson allows the student to assemble his experimental apparatus by use of the same touch-sensitive screen. The student then controls the heating of his chemicals and receives from PLATO a read-out on the distillation taking place. If the aspiring chemist errs, PLATO quietly blows up the computerized laboratory.

For the young remedial student, says David Henault, vice president for education and the Business Center network, PLATO's privacy is especially important, since, for such students, embarrassment and fear of failure are often major obstacles to learning.

"In school," says Henault, "it's often better to be a hell-raiser because that way the teacher won't call on you. Embarrassment does not come from being wrong. It comes from who knows you were wrong."

"Our success with the young student has baffled us. It's been much greater than any of us expected. But the thrill of it all comes from the parents. Honest to God, if I could put tape recorders in front of some of these people I swear I'd have the whole world coming to the Learning Centers."

As yet, however, the whole world is not coming to the Learning Centers.

"Marketing is the greatest problem," says Henault. "We have some programs that would benefit, let's say, the small businessperson, but the challenge is to make them aware of it." One former CDC employee who was closely involved with PLATO speculates that a part of the problem is the difficulty of conveying PLATO's potential to someone who has not seen the system in operation. "It's such an unusual, incredible concept," she says, "that until someone experiences it, it's impossible to grasp the capabilities."

Control Data hopes to address this problem with a bold marketing effort—the projected opening, by 1984, of 400 Business Centers nationwide. The CDC Business Centers will enter the already crowded field of retail microcomputer stores (Tandy Corp., IBM and Xerox, among others, are all opening such stores). The Business Centers, CDC officials say, will be different.

Tom Niemiec describes the Ohio Scientific microcomputers, which the Business Centers will offer, as "loss leaders." In other words, the micros are the bait which will bring the small-business manager into the Business Center, where, it is hoped, he will be sold on a wide range of CDC services, including employee training through PLATO. Each Business Center will

house a full-scale CDC Learning Center.

Says Gordon Brown, senior vice president for marketing, "One of the things we've lacked is marketplace pizzazz. The micros definitely have that. But you will find that Control Data is not following the course set by the competition. We're going to have a strong educational, applications—a software thrust, not an office-products thrust."

The jury is still out on PLATO. Thomas Miller, vice president for education, admits that "the application of technology inside the traditional academic system meets right now with a fair amount of resistance. It's a bit of a threat to the traditional way of teaching. We think the academic community will eventually see the advantages, but that's a long path."

On the other hand, according to Robert Duncan, PLATO is already enhancing all of Control Data's services offerings by providing the user with

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### "Until you experience PLATO it's impossible to grasp the capabilities."

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training on the more complex programs. This is clearly an asset, albeit one that is difficult to demonstrate in black and white.

In the short term, much of PLATO's future would seem to depend on the success of the Business Centers. Says Tom Niemiec, "PLATO probably hasn't been vindicated in the financial world. The Business Centers may turn it into a profitable venture. The Business Centers have to be viewed as a risk. If they don't pan out, a number of the services aren't going to work out either. If the Business Centers do work out, Control Data will be in a position in five years to offer unmatched products and services to small businesses."

**T**he history of Control Data Corp. is mainly the history of one personality—that of Bill Norris, a crusty, blunt ex-Navy man who founded the company in 1957 and holds the reins of power still at age 69.

CDC executives often describe Norris by quoting the slogans he has imprinted on their minds over the years. Among the favorites are: "It's more important to make the decision right than to make the right decision," and "Less sooner rather than more later." The aphorisms reflect Norris's burning impatience, his love of decisiveness, his willingness to try the untried and his absolute unwillingness to slow down or retreat once a course of action is set. This sense of

urgency has infected the entire corporation, according to Robert Price. "Bill's taught us all," says Price, "and we just don't know any better."

Which pleases Norris to no end. In July 1980, CDC's board of directors created a new "corporate executive office," moving Price and Norb Berg into their present positions and giving the three-headed office overall management responsibility for the corporation. The purpose, sources say, was to formalize an already existing operational procedure and to assure the financial community that the line of succession from Norris to a younger generation (Price is 49 years old, Berg 48) is in place.

(Insiders agree that Norb Berg is the heir apparent to the chairmanship, although both Berg and Norris decline to speak for the board. Berg does, however, go this far: "I've never had any ambition to be CEO. I'm not fascinated by operations or by bits and bytes. I guess I'd like to be chairman of the board.")

What the new organizational structure does not seem to purport is any significant shift in corporate outlook or strategy. "I think some of the guys on Wall Street were a little disappointed," crows Norris. "They talked to Bob Price and they found that he talks about the same as I do. Then they tried Berg and they couldn't detect any difference there, so they went away saying, 'Oh, God! It's never going to change.' That was the best reaction I could have had."

This unanimity among top management probably guarantees the continuation of CDC's aggressive, risk-oriented way of doing things, as well as its habit of scolding the rest of American business for what Norris sees as a myopic obsession with short-term return on investment.

"I'm real insensitive to corporations that are unwilling to take risks," says Norris. "If you make a bad decision you find out about it. If you never make any decision you never know. But with the resources that are available to a large company even a bad decision can be resurrected, modified, tailored into a good decision. The main thing is to get at it, to get a sense of direction established."

"Going into education, for example, was a very simple decision for us. We decided we were going to develop a better system of education through the use of technology, and there was a lot of skepticism. People said, 'Why don't you go out and conduct market research?' Hell, all that market research would have shown us was all the problems. You manage to the objective and don't waste your money on market research when you're addressing basic needs. It's ridiculous."

Ridiculous, too, in Norris's view, is the fondness of American business for serving *wants* rather than *needs*. He

blames this habit for many of our economic ills and adds: "I think the best example today is that the automobile industry was addressing what they perceived as wants. Everybody wanted a big car, but that wasn't what they needed. They needed fuel-efficient transportation. As a consequence, the auto companies have got themselves into a hell of a mess. Now take the field of education. You knew that if you could solve the problem, fill that need, you'd have a market. Market research would have proved you couldn't do it."

No doubt market research would have likewise proved the impossibility of starting a computer company from scratch in 1957, when the fledgling computer industry was already populated by a host of formidable competitors (General Electric, Sperry Rand, RCA, to name a few) and already dominated by International Business Machines, Inc., the undisputed Goliath of the computer world, variously known as "big brother" and "that other company."

And yet that, of course, is precisely what Bill Norris did, bolting from Sperry Rand, where he had served as head of the Univac Division, with a small band of rebels who proceeded to sell 625,000 shares of stock in the newly formed Control Data Corp. for \$1 a share.

Not too surprisingly, Norris's confidence that the venture could succeed stemmed from his perception of a *need* that was going unfulfilled. No one, Norris thought, had seen the possibilities for large-scale, scientific computers which might be of use to government, universities and large corporations. Accordingly, Control Data's first decision was to develop just such a computer. In April 1958, with Seymour Cray as designer, the fully transistorized CDC 1604 was announced. The first sale was made in June of that year to the U.S. Navy.

The decision to enter the data services field was not long in coming. Despite considerable opposition even within the company, Norris acted on his hunch about related services in 1960, opening the first CDC data center in Minneapolis. Two years later, again bucking the prevailing wisdom, Norris acquired PLATO, a decision which, in Robert Chinn's words, "is ultimately going to decide what this company is going to be."

Control Data's growth during its early years was phenomenal. Revenues totaled \$4.5 million in 1959, \$28 million in 1960, \$39 million in 1961 and nearly \$80 million in 1962. In that year, however, IBM apparently began to find its new competitor tiresome, introduced its own large-scale computer which eclipsed the 1604 and very nearly put Control Data out of business. "We didn't get an order for almost a year," recalls Norris.

Badly shaken by the experience, Norris and company rushed into develop-

ment of the next generation of super computers. The CDC 6600 was introduced (prematurely, it is now admitted) in 1963, and while early sales were promising, the computer quickly began to show technical problems in the field. IBM could hardly have been expected to pass up such an opportunity.

Control Data officials, even now, have few kind words for IBM's tactics against the 6600. IBM, they say, began assuring customers that they were developing their own competitive super computer, an announcement that persuaded many potential buyers of the 6600 to cancel or postpone their orders. Primarily as a result of this, insists Norris, Control Data suffered a \$1.9-million loss in 1966, not an especially large loss compared to others in CDC's formative years, but certainly an irritating one.

The IBM computer, however, never materialized, leading to charges of "paper machines and phantom computers." Says Marvin Rogers, executive vice president for finance at CDC, "Whatever we were trying to sell, they had something better that they hadn't built yet. IBM always had a better product that wasn't having any problems because nobody had seen one."

But if the competition was a phantom computer, Control Data's losses were painfully real. Two important strategies emerged from these disastrous bouts with IBM. The first was to pursue even more aggressively market niches that would avoid direct confrontation with big brother in the marketplace. The second, perhaps Norris's boldest stroke, was to confront IBM in court. Control Data's antitrust suit against IBM was filed in December 1968. Characteristically, many observers considered the move an absurdity.

"A lot of people thought we were insane to go up against a company like IBM," says Benjamin Kilgore, vice president for venture operations. "The argument was that IBM had far more resources and the suit would take decades to settle. But the work that was done by our attorneys and others inside the company, analyzing data and preparing court materials, was just outstanding."

CDC's complaint charged IBM with violations of Section 2 of the Sherman Antitrust Act, which pertains to monopolistic practices. Included, of course, was the phantom computer episode, but the complaint also accused IBM of using various kinds of intimidation to prevent customers from dealing with other computer firms and of offering discriminatory pricing packages. Perhaps most important from Control Data's point of view was IBM's refusal to "unbundle." IBM had insisted on offering *all* the components of a computer system—hardware, software, maintenance—under one umbrella price, thus preventing other companies from com-

peting in any individual area.

"You can see why this was important to Control Data," Price says. "If you want to be in the services business and you want people to appreciate the value of the applications software they're getting, you've got to make it visible to them so they don't think it's free."

The case did not require decades to settle, despite IBM's initial response that the complaint was "inconsistent" and "baseless." Control Data attorneys catalogued some 230,000 IBM documents, took depositions from 75 IBM executives and collected thousands of hard exhibits for trial use. "By 1972," says Ben Kilgore, "we had developed a pretty strong case, and IBM was ready to get us off their back."

They were also ready to pay a price. The January 1973 out-of-court settlement offered by IBM was a triumph for Norris and Control Data. It included the acquisition, at a bargain price, of IBM's powerful Service Bureau Corp.—a network of 40 data-processing centers specializing in business accounting services—as well as a guarantee by IBM to stay out of the data services business in the United States for six years and the payment to Control Data of \$96 million in research grants.

(It is interesting to note that the federal government also filed an antitrust suit against IBM in 1968. That case has gone nowhere, perhaps, some have suggested, because the government fears weakening IBM in the face of increasing foreign competition.)

It would be hard to exaggerate the importance of this episode in Control Data's history. Nothing else has done as much to solidify CDC's position in the services field or to free the company from the tyranny of IBM control of the market.

"We're no longer vulnerable to IBM at all," says Norris. "They've got their ballgame and we've got ours, and ours is a lot better."

Adds Robert Price, "I go out and talk to other people in the industry and all they want to talk about is when the IBM Series H or whatever is going to be announced. I really don't give a damn. I just don't care. Not that it won't affect our business. Of course it will. But having that services thing to stand on gives us stability and a focus and purpose for the business."

The peripheral products business has also turned out to be an important source of stability and profits for Control Data—to the surprise of everyone, including Bill Norris. According to Thomas Kamp, president of the Peripheral Products Co., CDC's decision to move into peripherals began obliquely enough, because of some difficulty in 1959 in obtaining a device called a paper tape reader (then used as a computer program). Norris turned to Cedar Engineering, a small company

Control Data had acquired in 1957 and asked them to manufacture the device. This was successfully done.

The crucial decision, according to Kamp, came in 1963, when it became apparent that IBM was about to announce a new type of memory storage called the disk drive which would eclipse the prevailing tape transports, reducing access time from minutes to milliseconds. Kamp promptly put into development his own version of this technology and, when ready, requested permission to build Control Data's first 100 disk drives. The wisdom of this idea, he recalls, was not universally appreciated.

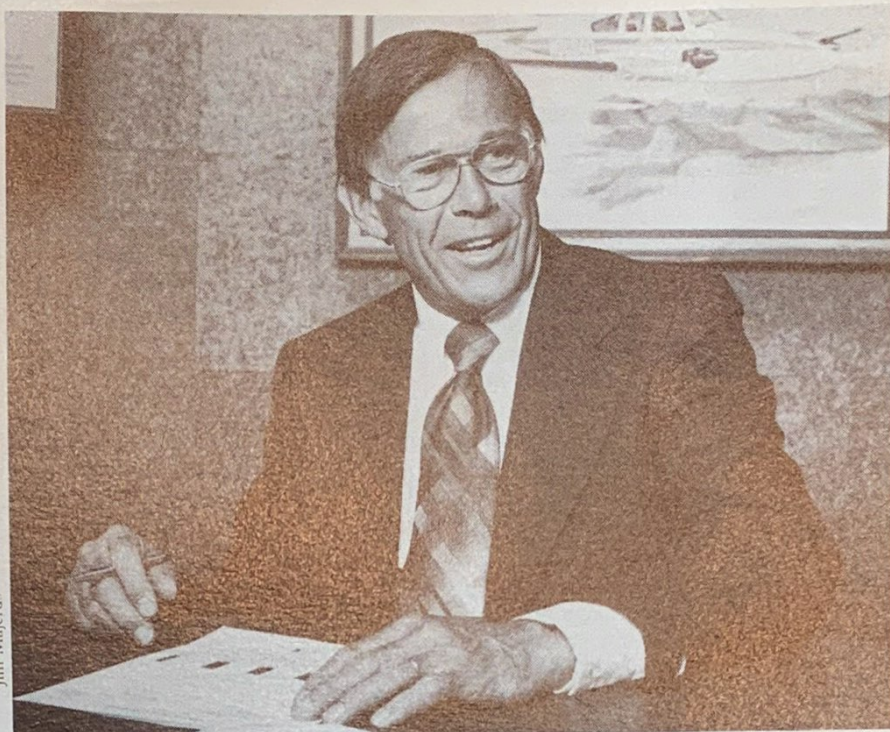
"The systems people, the planning people, didn't want it," says Kamp, "because IBM was now coming out with a more advanced version. Norris asked what I wanted to do. I called him up and said I wanted to build them. 'What if the systems people don't want them?' he asked, and I said, 'Then I'll sell them to somebody else.' That was a crucial moment, because on that flimsy idea Norris approved the authorization.

"We built the 100 units and we ended up selling thousands of them. Over the past 15 years we've shipped hundreds of thousands of disk drives. We'll probably ship 180,000 or 200,000 this year. We're now the world's largest producer of disk drives, even larger than IBM."

The flimsy idea upon which Kamp had struck was, of course, the OEM peripherals business—the sale of peripheral equipment to computer manufacturers other than IBM for use in their own computer systems. The strategy of selling to the competition struck many as risky and self-defeating, and still more believed as the business developed that the OEM market was a pleasant but strictly temporary profit maker.

Says Kamp, "Everybody, including Norris, used to say, 'Gee, that OEM business is a nice business; too bad it won't last.' The theory was that the economics of the situation would force everybody eventually to make their own peripherals, and everybody started out to do that. GE started doing it, Honeywell started, everybody did. What escaped all the analysts was another economic factor. That was, if you were one of the seven dwarfs [the seven largest computer companies other than IBM] and needed only 100 to 200 disk drives per month, you couldn't afford the technology and tooling to get into that business. IBM's rate of technology change was so great that you couldn't afford the investment."

Late starters in the peripherals field, Kamp explains, were never able to catch up with IBM technology. No sooner would Honeywell or NCR develop the current generation of disk technology than IBM would announce a new system with twice the storage capacity. Control Data, having gotten an early start, has



Thomas Kamp: a "flimsy idea" that became a billion-dollar-a-year business.

been able to trade technological innovations with IBM and has become the clear leader in the OEM field through two joint ventures. Magnetic Peripherals, Inc., a joint venture with Honeywell, manufactures magnetic disk drives. Computer Peripherals, Inc., a joint venture with NCR, manufactures printers, tape transports and the like. In each case Kamp maintains absolute management control. Control Data's peripherals sales topped the \$1-billion mark in 1980.

Yet, with all of this more or less in place by the early 1970s, Control Data was still having its problems financially. In both 1970 and 1974, partly as the result of economic downturns, CDC lost a number of major computer-systems contracts. Economic conditions likewise damaged the peripherals and services businesses, which were then, in any case, far too small to be of significant help. In 1970, CDC suffered a \$46.6-million loss on its computer operations. In 1974, those losses totaled \$35.6 million. More troubling still, the five years between 1970 and 1974 produced for Control Data a net loss on computer operations of nearly \$80 million—a performance which led, admits Ben Kilgore, "to severe problems of credibility in the financial community."

Although it is a company premised on the computer, Control Data's non-computer operations have been crucial from a financial standpoint: in the past 10 years, CDC's computer operations have netted a slim \$75.4 million, or only about 15 percent of total earnings. Computer operations actually *lost* money in three of those 10 years. The company's other operations, meanwhile, netted

CDC \$426.6 million in earnings during the same period, and it was only in 1979 that computers made more money for the company than their other operations. While CDC estimates that its computer business will net around 60 percent of 1980's projected earnings, the bottom line to all of these bottom lines is that Minnesota's best-known computer company did not get to where it is today by selling computers.

In light of those earlier financial difficulties, an argument can probably be made that CDC's single most important strategic decision had nothing to do with services or peripherals or large computers or large competitors, but was in fact the acquisition in 1968 of Commercial Credit Co. Commercial Credit, a robustly healthy nationwide finance company, has steadily contributed earnings in the \$30- to \$50-million-per-year range, and while CC's finance and insurance operations have yet to be effectively coordinated with the computer business (again the Business Centers offer hope), Robert Price feels justified in paying Commercial Credit the supreme compliment: "It's not entirely clear," he says, "that we would have survived without them. I can't say that we wouldn't have, but looking back it would have been damn hard."

While Control Data's profitability, by any measure, continues to trail that of many competitors, the dramatic earnings improvement since 1974 has quieted even the company's harshest critics. The \$79-million loss in computer operations for the '70-'74 period can be compared to net *earnings* of \$154 million in the five years between 1975 and 1979. During the



first nine months of recessionary 1980, computer-earnings growth moved along at a respectable 15 percent.

**W**hen it comes to the computer's ability to solve social problems, Bill Norris is positively irrepressible. Asked whether computer-based education might not run afoul of the current conservative trend in America, and the general aversion to centralization, especially in education, Norris responds by explaining how the computer is about to lead us on a triumphant return to the one-room country school.

"It was a tragedy in this country when they consolidated all the schools in these small communities," says Norris. "The small towns have lost their school, their focus of community life, but they can undo all that now through the use of the computer. In fact, today, through the availability of PLATO, the one-room country school in Nebraska where I went to school could have a curriculum exceeding that of the Minneapolis schools.

"And we ought to have much smaller units in the cities, on a neighborhood basis where kids can get to know each other. Today you go to one of these big anthills and if you survive you're damn lucky and if you learn anything you're even luckier.

"I think it's terrible that we've drifted into this situation. But God, yes, the computer can reverse all that."

Beyond what the computer itself can do, Norris—who now has little direct involvement in CDC's day-to-day operations and a very heavy speaking and writing schedule—has for years been insisting that American business, especially big business, has both the means and the responsibility to address society's problems, and that doing so is directly in business's self-interest. If inner cities continue to deteriorate, if small farms and small businesses continue to fail at the current alarming rate, if millions of Americans remain jobless and hopeless, Norris believes the only possible result will be still more costly and ineffective government action and still more hostility toward the business community.

But Norris is not talking about charity. He is talking about a grand business strategy. Control Data officials are quite serious about their well publicized goal of addressing society's major needs as *profitable* opportunities. Says Norb Berg, "You can't get a good manager to run something that's not for real. If he's expected to produce, the right things get done. We put into our inner city plant in North Minneapolis an activity that we had to make successful because our business depends on it. We put a unit in there to make the outer frames for large computers that are a part of every computer system we deliver, so we couldn't sit back and say, 'Oh, hell, we've got six sources for that part.' No. We made

ourselves dependent on making it successful."

And, according to Berg, the various entry-level manufacturing plants Control Data has located over the years in depressed areas of Minneapolis, St. Paul, Bemidji, Campton, Ky., Washington, D.C., and San Antonio are successful and profitable. They certainly seem to have had a positive effect on their communities. The Campton plant, says Thomas Kamp, has doubled the per-capita income of that depressed rural county. CDC's bindery operation in St. Paul has grown rapidly, today employing 288 permanent part-time workers (mostly women with young children and college students, all of whom benefit from the plant's flexible part-time schedule).

But it should come as no surprise that a company as fiercely devoted to education as Control Data should consider job *readiness* at least as important as job creation. Through some 35 Fair Break programs across the country (often tied directly to inner-city plants, almost always funded by the federal job training program CETA) Control Data has provided thousands of high school dropouts with basic-skills education and career counseling. According to Gail Bergsven, vice president for human services programs, 87 percent of Fair Break participants have been placed in jobs. Meanwhile, Bergsven forecasts a "slight profit" on Fair Break for 1980.

Yet according to Herb Trader, president of City Venture Corp., the shortcomings of CDC's initial inner-city efforts have been at least as informative as the successes. "The problem with what we did in Minneapolis and St. Paul," says Trader, "was that it was piecemeal. It wasn't planned together, so it didn't leverage much from the governmental side and didn't encourage other businesses to do anything. It's tragic to go over to Control Data's plant on the North side and see nothing else around it. The same holds true of the Selby facility in St. Paul. It's been good for the people in that area, but if it had been done in a planned way and we could have applied leverage, a lot more would have happened. That's what we intend to do with City Venture."

City Venture is not strictly a Control Data program. It is a consortium with 15 stockholders, including the Star and Tribune Co., Dayton Hudson Corp. and two national church groups, although CDC is by far the largest single stockholder, with 35 percent of the subscribed stock.

City Venture is a unique entity. It is a kind of free-lance management firm, offering its services (and the wide-ranging expertise and resources of its stockholders) in the planning and implementation of comprehensive urban revitalization projects. The idea is to combine federal urban development

grants and local monies with a heavy injection of private investment in order to create jobs and foster the development of new small businesses in depressed urban areas.

Some of those new enterprises may find a home in Control Data's Business and Technology Centers—office buildings specially designed to serve the needs of small technological firms, while offering all tenants and outside clients a broad range of clerical and computer services—including, of course, PLATO. Fifteen Business and Technology Centers are now planned, mostly in conjunction with City Venture projects, although the first BTC is now in operation in downtown St. Paul.

City Venture currently has projects underway in Toledo, Ohio, Philadelphia and Minneapolis, and is considering others in Baltimore, a coal-mining region of West Virginia and Miami. The Toledo project, says Trader, "is in the implementation stage," and has been termed by Walter Mondale "the model neighborhood revitalization project in the country." The Philadelphia effort, too, is moving along well. It is in Minneapolis, oddly enough, that City Venture has run into a snag.

City Venture's Urban East project—calling for the creation, by 1984, of 3,000 new jobs in a 70-acre district east and south of downtown Minneapolis—elicited hat-in-the-air reviews from all quarters when it was first announced in 1978. Since then, however, communication between the corporation, local community groups and the city seems to have faltered. In September 1980, the application for a major UDAG (Urban Development Action Grant) was postponed because of city council concerns over the actual amount of private investment committed to the project. For the moment, at least, the project is dead in the water (although 100 jobs through Magnetic Peripherals, Inc., and 60 through an extension of the St. Paul bindery operation are already in place, and construction of Control Data's second BTC is nearing completion).

Lee Cook, formerly a senior consultant with Control Data, now a private consultant closely connected with a number of community groups in the urban east area, believes City Venture has been "arrogant" and "insensitive" in its dealings with citizen groups. "They don't know how to deal with people in a democratic system," says Cook. "They haven't asked for input. They've just come in with a unilateral program." Cook adds that many community leaders resent CDC's use of federal job training funds—funds which they believe could be far more efficiently employed by non-profit agencies.

Control Data officials, meanwhile, express barely reserved impatience over the Urban East stalemate. Says Norb Berg, "The Bible says a prophet is without

honor in his own land. Maybe there's some of that in it. What is needed of the city is commitment, not just a lot of good words. There may be some very committed people out there, but it's not coming together as rapidly as it has everywhere else." Nevertheless, Berg says confidently, "Urban revitalization will be the growth industry of the '80s." (See also this month's Corporate Citizens column, page 26.)

Not far behind as growth industries, in Control Data's view, will be rural development and health care. By rural development CDC officials mean the revitalization of the small family farm, and, typically, they think the computer is the tool for the job. Says Berg, "There's a lot of technology around to help small farms make it, but that technology being ungathered and untaught isn't going to get us there. We have the capability to gather that know-how and educate small-farm owners in how they can make it, so we're doing it."

CDC is currently sponsoring 15 small-farm owners near Princeton, Minn., providing financing assistance as well as computer terminals through which the farmer can receive crop forecasts, business management help, detailed weather information and, of course, PLATO. Control Data is also conducting a wide range of experiments in advanced agricultural technologies—such as aeroponic and hydroponic agriculture—and Rural Venture, Inc., a consortium similar to City Venture, has dispatched the aforementioned potato experts to the Arctic with hopes of implementing comprehensive rural

development programs there.

In health care, Control Data has added two new programs to its long-established MEDLAB, a computerized testing and records system for hospital pathology laboratories and several projects which study and serve the medical needs of isolated rural areas like the Rosebud Indian Reservation. One of the new ventures is StayWell, a computer-delivered, motivational-educational program originally developed for CDC employees but soon to be marketed to other firms. StayWell provides each individual with a personal health evaluation, and then offers instruction on what the individual can do to improve his or her prognosis. In an age when, according to Lee Kremer, a company like General Motors spends more on health benefits than on steel, CDC sees a bright future for StayWell.

Finally there is Homework, another program which began internally at Control Data. Homework is a system through which seriously disabled employees can continue working from their homes via a computer terminal. The first outside sale of Homework was made in October of last year to Goodwill Industries of Atlanta.

**S**imply stated, there is no more innovative company in the world than Control Data."

So wrote Bill Norris to CDC stockholders in 1979. At the very least—as the wide, not to say wild, array of social projects described above suggests—there are few companies as willing to try new ideas or to forego short-term gain for long-term potential, which is perhaps the same thing.

"We're blessed with living in the era of the founder," says Norb Berg. "A founder who is chairman of the board and CEO has a very powerful role. He can take risks and can provide the umbrella under which others can take risks." But in Berg's view the principal risk now confronting Control Data derives from external economic forces, not from any weakness in the corporation's strategy. "Our strategy is working," he says. "We're a pretty good business right now. I'm not worried about our ability to remain a leader where we are a leader. On the other hand, I can't control what happens out there in the world marketplace."

It is entirely possible, of course, that the sheer sprawling diversity of Control Data's enterprises will insulate the company (as it seems to have partially done in 1980) from future vagaries in the marketplace. And if that diversity leaves Norb Berg feeling at times overwhelmed ("You have to have a tremendous inkling as to what's going on in this business," he says, "or maybe you need a tremendous number of inklings"), he can take heart in the knowledge that even Bill Norris knows the feeling.

"Some days," says Norris, "I talk to Berg and Price and I say, 'God, we just can't do anything new for awhile. We've just got too much on our plate.' And then some employees come in with a good idea all ready to go, and so, fine, we do it. . . . As a matter of fact I have one right here on my desk that they want to do, and I'm gonna have to find some way of talking them out of it."

In this endeavor, at least, Bill Norris seems almost certain to fail. **CR**



Worldwide  
Corporate Headquarters  
8100 34th Avenue South  
Minneapolis, Minnesota 55420  
612/853-8100

Mailing Address  
P.O. Box 0  
Minneapolis, Minnesota 55440

# CDC: A Look at the Numbers

The Upper Midwest has had many business success stories over the years, but one of the standouts, in the post-war era, is Control Data. Formed only 24 years ago, the company has already achieved the stature of a multi-billion dollar enterprise. Control Data is the world's leading manufacturer of large-scale scientific computers.

Acquisitions have played an important role in the development and growth of CDC. The acquisition of Commercial Credit in 1968 was probably the most significant. A large, diversified finance company, Commercial Credit has provided Control Data with a finance business to aid in leasing computers, as well as profitable operations to help the company through the years of deficit computer operations (1970, 1971 and 1974). The computer-related business showed a sharp earnings recovery in 1975 and has enjoyed consistent growth since then. In 1980, the computer segment probably was responsible for over 60 percent of net earnings.

Actually, sales of computer systems only account for about 20 percent of computer revenues, as Control Data has become an extremely diversified computer-services company. The integration of Commercial Credit with computer operations is transforming CDC into a very distinctive organization within the data-processing industry.

The peripherals business is an important part of Control Data's computer operation, as it now accounts for some 42 percent of computer revenues. However, computer services account for about 38 percent of revenues and are also highly significant.

Computer services will be a featured product in the new, small-business retail stores the company has been opening of late. From a base of 100 Learning Centers, Control Data has converted eight to full-blown Business Centers, and management states, "There will be more than 50 Business Centers by year-end 1981." Also, Commercial Credit is establishing Business Centers specializing in financial services which will work cooperatively with CDC's other centers on a referral basis. Commercial Credit expects to have 75 centers set in operation by the end of 1981, of which 24 will be full financial centers and the remainder mini-centers. So, between the computer business and Commercial Credit there will be over 100 Business Centers open by year-end 1981. Management optimistically says they will have

400 by the end of 1984. The centers will be quite similar to each other from the customer's standpoint, whether run by Commercial Credit or Control Data.

Commercial Credit currently operates more than 800 offices in 46 states. About 72 percent of its revenues are finance and 28 percent insurance. With so many locations already in existence, the goal of 400 Business Centers in four years should not be a problem, and they should help the growth of both the finance and computer operations. We would point out that even assuming complete success for the Business Centers, they will still contribute a relatively small portion of the company's total revenues.

Control Data's computer business has grown rapidly in recent years. Revenues in 1975 were \$1.2 billion, but net earnings were only \$9.3 million. We estimate 1980 revenues were nearly \$2.8 billion and net earnings \$90.6 million. This works out to a growth rate in revenues of 17.3 percent and 57 percent annually

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## Sales of computer systems account for only 20 percent of computer revenues.

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in net earnings. The very high growth rate in earnings is due to the fact that five years ago profitability was quite low. It is clear that dramatic improvement has been made on this score, with the pre-tax profit margin rising from 2.2 percent in 1975 to an estimated 6.4 percent at the end of 1980.

Commercial Credit has not been standing idly by over this period. Its aggregate revenues in 1975, including gains on investments, were \$675.1 million and net earnings were \$28.4 million. Revenues and earnings have increased annually and we estimate 1980 earnings of \$55 million on slightly over \$1 billion in revenue including gains on investments. Over the past five years, net income has grown at a 14.1-percent annual rate.

Control Data has made considerable progress in improving its financial structure. At the beginning of 1975, computer-business capitalization con-

sisted of two-thirds debt, one-third equity. At the end of 1979, total computer-business debt was down to a ratio of one-to-one debt to equity. Further improvement in this ratio was made in 1980, aided substantially by the sale of 1.5 million shares of common stock at \$75.50 per share last September, raising some \$109 million equity for the company.

At the end of September, Control Data's non-current liabilities were \$497.8 million and stockholders' equity was \$1,430.8 million, or 74.2 percent of capitalization. Commercial Credit is not consolidated on Control Data's financial statements, but the investment in Commercial Credit is reflected by utilizing the equity method of accounting and CCC's net earnings are separately included in the consolidated earnings statement.

Listed on the New York Stock Exchange with the ticker symbol CDA, Control Data stock recently traded at around \$70 per share. There are about 18.7 million shares outstanding with an approximate float of 13.5 million shares. The stock traded within a range of 77-5/8 - 43 in 1980.

Earnings per share for Control Data, including Commercial Credit, have increased from \$2.20 in 1975 to \$7.20 in 1979 and were, by our estimate, \$8.20 last year. Further growth is anticipated in 1981 to about \$9.05 per share. The company's current dividend is \$.60 per year: small, but necessarily so to enable the company to finance its growing business.

Robert M. Price, president of Control Data's computer company, says, "Obviously, future performance comparisons won't be as dramatic as they have been in the past, where the basis of comparison were years of minimum profits. But our plans call for steady growth in profitability; they also call for continuation of large investments in the future. This strategy has proven sound and we will continue it."

The integration of computer technology into everyday life is moving apace. We see it on every hand; at home, in the office, factory or small business. With this revolution comes innumerable problems such as, how to use it? What to buy? Lease? Who can help me?—Control Data thinks it can. **CR**

*Kenneth W. Johnson, C.F.A., is a vice president of Piper, Jaffray and Hopwood.*

# Vive la Difference!

It's not easy to write about Control Data. And that's because it's not easy to *think* about Control Data. For Control Data confounds our categories. It frustrates our attempts to judge it by criteria developed for "mere corporations." This is especially discomfoting for people like journalists who are paid to be skeptical—and frequently confuse that professional necessity with cynicism, an occupational hazard.

In many ways, Control Data is like any other business. It manufactures a product, sells it and services it. Even its seemingly offbeat ventures are regarded, on the inside at least, as "strictly business," and those who speak for the company never tire of reminding you that their objective is *to make a profit*. In all this, Control Data seems almost a lock-step marcher to the capitalist drum.

On the other hand, the company frequently looks more like a parade unto itself. It paid no dividends for 20 years, and although stockholders enjoyed reassuring capital gains, 20 years does seem to flout the system. Faced with a prodigious need for cash, Control Data did not go to the bank; it acquired a "bank" by buying Commercial Credit Co. A company officer once told me, "Commercial Credit is a cash-generating machine; the computer business is a cash-eating machine." In a sense, that acquisition put Control Data in the business of "income transfers," an enterprise normally associated with government. (Some old-line Commercial Credit stockholders took resentful note of that, incidentally.) And, of course, there are all those "non-Magnetic peripherals" that look more like a program for social justice than a business strategy.

Received opinion declares that the fundamental purpose of any business is to make a profit. Not so, says Bill Norris. The fundamental purpose of business is to meet social *needs*. Profits are thus the penultimate, not the ultimate, goal. This, plus the stress upon needs as opposed to wants, seems to be at the core of Bill Norris' business philosophy. It is at once radical and reactionary: radical, because it challenges us at fundamental levels; reactionary, because it returns a heavy dose of moral concern to business philosophy. It says that elevating profits to ultimate status perverts business' rightful goals and thus reduces its rightful claims, and it says that some products (those that meet needs) are

morally superior to others (those that meet wants).

Admittedly, the difference between needs and wants is a judgment call—as is the difference between profits as ultimate and profits as penultimate—but judgment, after all, is what executives are paid for.

Whether Bill Norris and his kind at Control Data can save the family farm, renew the central city, reinvigorate small business, educate the young, the old, the under-privileged and the disabled, make us all healthier and keep selling computers is, of course, an open question. What seems clear is that, by word and example, Norris is calling for something like the total reappraisal advocated four centuries ago by Francis Bacon, whose *Novum Organum* laid important intellectual foundations for scientific method. The scientific tests for truth, based on empirical observation, experiment and inductive reasoning, led, among other things, to the computers manufactured at Control Data, but Bacon's concern for *how* we learn was penultimate to his conviction about *why* we learn: "To the glory of the Creator and the relief of man's estate."

That's the moral element that makes the difference in writer Doug Tice's anecdote on page 54 between those who are making "\$5.27 an hour" and those who are making "a grand edifice to the glory of God." Such moral certitude has grave dangers (witness the difficulties Norris' lieutenants have encountered with City Venture), and moral choices are frequently highly leveraged in that small differences can lead to large consequences, but if Bill Norris and Control Data can rekindle sensitivity to these judgment calls, all business will have "profited."

□ Readers will note a slight addition to our logo this month. We have added "Minnesota." As a matter of fact, this is only an addition to the logo and not to the demographic facts of our circulation, 93 percent of which is in Minnesota. The change has been largely in response to concerns among our colleagues in the Association of Area Business Publications who have argued persuasively that, since we are all regional some indication of the region should appear in each publication's title. To which we now say, "Amen," and "Hail Minnesota!" There will be no change in editorial policy. We will continue to cover the Upper Midwest. **CR**