

Old Programs, New Problems

By ANDREW POLLACK

When people think of computers, they often envision the latest in sophisticated technology. However, for many companies and government agencies that use computers, that is not always the case.

Many computer users, in fact, are now saddled with outmoded computer programs that slow down the systems, constantly threaten to break down and are difficult and costly to maintain.

Instead of working to expand the use of the computer to perform new corporate functions, many company data processing departments, which have neglected to replace computer programs as they aged, now spend more than half their time and money merely to keep existing programs running.

"It's like a road with potholes," said Thomas E. Bell, president of the Computer Technology Group, a consulting concern in Warren, N.J. "It's easier to just put in patches. Eventually they become patches upon patches and the whole stability of the road is undermined."

The Federal Government, the largest computer user, estimates that its

computer programmers spend two-thirds of their time in maintaining old programs rather than writing new ones, said John A. Caron, an official in the General Services Administration's Office of Software Development. That amounts to \$1.3 billion a year, equal to the Government's annual expenditures on computing equipment.

The vice president of data processing for a New Jersey-based insurance company laments that \$3 million to \$4 million a year, nearly 80 percent of his programming budget, goes to fixing and changing old programs.

"Some of the programs may have taken five or six people to write, but now they take 10 or 12 people to maintain," he said.

Computer programs, or software, are the instructions that tell the computer how to do everything from paying a company's bills to tracking its inventory.

Most computer users have written their own programs. The programs can grow to thousands or millions of lines of instructions and represent an investment that, when measured over all computer users, is estimated at billions of dollars.

Computer users are not about to du-

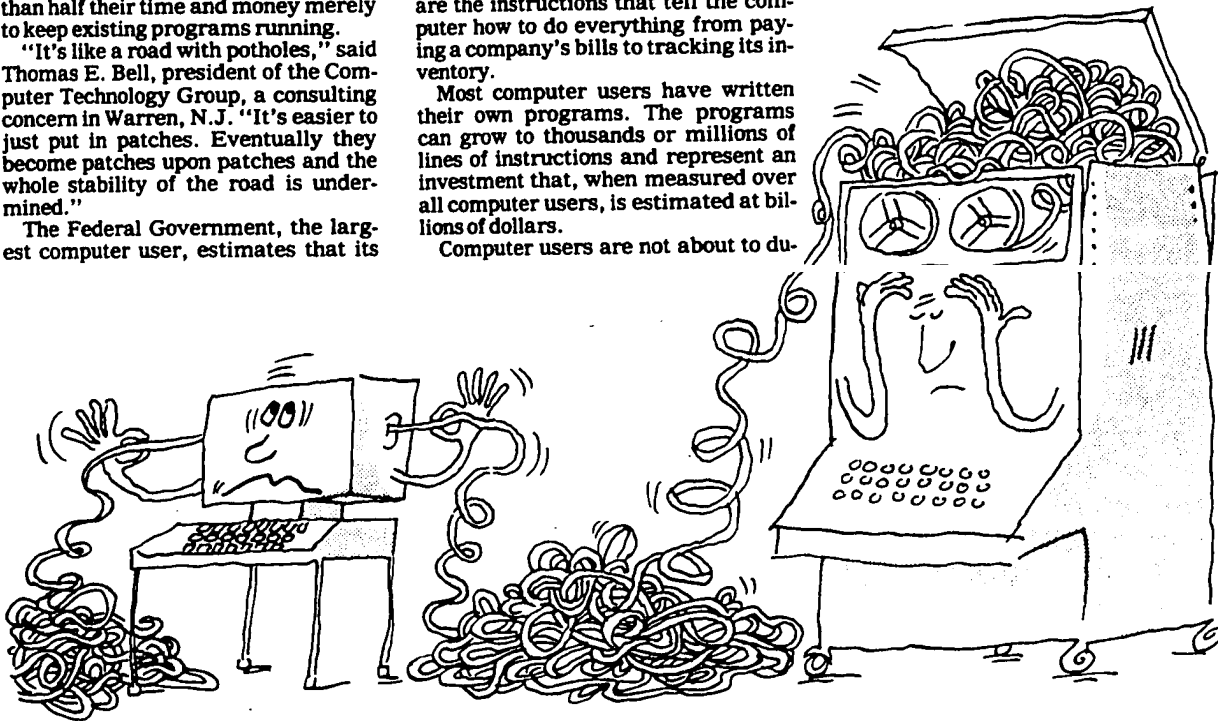
plicate that investment if they can help it. And the specter of having to redo all their programs has kept many users from switching from one computer manufacturer to another.

And the computer makers, to help sales and avoid enraging their customers, have generally made sure that each new computer they develop can use programs that operated the old computer.

The result is that, even as machines are periodically replaced with newer ones, the programs grow older and older.

But what happens over the years is that changes must be made in those programs. Errors are found and cor-

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rected. Tax laws change. Management wants data analyzed in a new way. A bank wants to offer a new type of account. Like a manuscript that is edited and re-edited too many times, the computer program eventually comes to resemble a ball of spaghetti — an indecipherable mess.

One result is skyrocketing costs for what is called "software maintenance." Each new patch makes the program's logic harder to follow, making the next change take longer.

Lack of Documentation

Compounding the problem is that in the case of old programs, the original programmers did not write good explanations of how the program works and have since left the company, leaving no documentation and nobody who understands how the program works.

Also, many older programs are written in assembly language, an old programming language that not every programmer today knows how to use.

Making matters even worse is the shortage of computer programmers, especially for software maintenance, a job with the appeal of technological janitorial work.

New Demands on Programs

Even with high maintenance costs, old programs can break down. The data processing manager of a Fortune 500 company said that his company's 10-year-old general ledger program would stall at inopportune times, threatening to make the monthly and quarterly financial reports late. "You find yourself here at midnight wondering why the books don't close," he said.

Old programs can impede the expansion of computer services, partly because their maintenance diverts programmers from writing new programs and partly because old programs cannot take advantage of new

computer technology.

Old programs, written at a time when much computer processing was done overnight, cannot readily be adapted to the new mode of operation in which workers call up information and process it instantaneously at desktop video display terminals.

"If you do not have up-to-date computer resources it is difficult, if not impossible, to offer new services," said R. Lamar Brantley, staff vice president of the United States League of Savings Associations.

More Complex Languages

A survey of savings association computer systems conducted by Index Systems, a Cambridge, Mass., consulting firm, found that more than 40 percent of the computer programs keeping track of savings accounts were more than five years old and written in older, more complex language.

A big fear is that, ultimately, old systems will break down altogether. "I don't know if you really reach such a point where things fall apart," said Mr. Caron of the General Services Administration, but he added, "We are coming dangerously close to that point."

An example is the Social Security Administration's outmoded computer system, which is buckling under the demand of writing the monthly checks and recording worker earnings.

High Risk Involved

Despite the benefits to be gained from replacing the old programs, obstacles are great. "The agencies have too much invested to tear things down and start again," Mr. Caron said. Compounding the problem is that company programs written in-house have generally not been depreciated, but are treated as expenses.

Another factor is that many companies have fallen far behind in writing new programs to provide new services. The return from computerizing a new function is higher than that for re-

writing a program to handle some function that is already handled by a computer.

"It may not do the job as well as you like, but it is still automated," said J. Thomas Horan, vice president of information systems operations for the Aetna Life and Casualty Company.

Fear of Change

Finally, there is the risk of making a huge change in the existing programming that might not work. Joseph J. Daniero, assistant vice president of data processing for the Delaware Management Company Inc., a Philadelphia mutual funds manager, said the system used by the company for retrieving records from the computer was so slow that he often had to work until 4 A.M. to finish his job. But he said that he was "terrified" of trying to change the system.

"It's very critical that the business runs, no matter how long it takes," he said. Yet when the software was replaced, programs that took six hours to run were being completed in 45 minutes.

The answer for many computer users is to gradually phase out old programs. The Federal Government set up a project in 1980 to try to manage the transition to new software. Some companies are finding that prepackaged programs are less expensive than writing or rewriting programs on their own. The software companies that provide such programs can also do some of the maintenance.

However, modernizing programs must still compete with other demands on the programmer's time — not the least of which is keeping the old programs running during the transition. Meanwhile the problem gets worse.

"It's down-in-the-swamp-fighting-alligators time," said John M. Thompson, vice president of Index Systems. "You can't figure out how to drain the swamp and escape because the alligators keep coming at you."