

SPENDING at a rate of more than \$20,000 a month for commercial time-sharing services, New York's First National City Bank brought time-sharing in-house under the supervision of vice president Robert Parker (left.)



Citibank's in-house time-sharing speeds responses, controls costs

While countless banks have in recent years discovered the advantages of time-sharing, few have progressed to the point where they would want to establish their own on-premises time-sharing service for bank use only. Most banks view time-sharing as a vehicle for enhancing their overall computer capability by tying in, as one among many users, to a system that they ordinarily could not afford by themselves. By its very nature, time-sharing creates economies over the alternative—installation of an extra or larger computer system to do the work being done in time-sharing.

On or off premises

Only when a mammoth bank such as New York's First National City goes into time-sharing in a big way does the question arise: "Would on-premises time-sharing capability be less costly and more efficient

than the more conventional off-premises arrangement?"

Citibank, third largest in deposits in the U.S., faced its moment of truth about two years ago when a team of researchers assigned to study the problem proposed the establishment of an analytic computing center, which would be run as a separate and distinct entity from the conventional data center.

Rationale for this proposal, reports Robert W. Parker, vice president of data processing, was a situation in which the bank's various departments were using 14 time-sharing terminals, had contracted for facilities from at least five different time-sharing service groups and were spending more than \$20,000 per month.

The bank had started with one terminal and a monthly cost of less than \$1,000 early in 1966, but it soon became apparent, Parker recalls, that time-

sharing was a major bank tool with myriad applications.

In the past, the Citibank vice president suggests, "as a practical matter it was impossible to apply analytical techniques when decisions had to be made rapidly. Rather, intuition and more or less educated opinion have been the primary guides for decision-makers. Although computational facilities were available for a number of years, turnaround time was too slow; answers would come back in days when they were needed in minutes.

"It is the extremely fast turnaround time, coupled with intrinsic arithmetic ability, that has made present time-sharing facilities so useful," says Parker. "Eight hours of hand arithmetic can be done in seconds on a computer. Training, experience, knowledge of the particulars, need no longer be sidetracked for arithmetic, and arithmetic need no longer be ignored.

No programmer is required

"Another factor in the growth of time-shared computer usage is the recent development of analytical techniques," Parker indicates. "Bankers are finding such techniques extremely worthwhile. In terms of decision-making, one restates the problem mathematically (e.g., one constructs a 'model') and then proceeds to solve the mathematical problem according to carefully defined rules. Using time-sharing, a bond specialist, say, can in a few minutes determine an optimal coupon schedule for an issue without needing the help of either a programmer or a highly trained mathematician. Their work has already been embodied in a program that the specialist uses repetitively."

It wasn't long before a number of departments at First National City Bank had discovered the wonderful world of time-sharing:

- Early in 1966, the investment research department signed a contract with General Electric for time-sharing services. It later took on a second console and supplemented the GE service with that of another supplier. The reason: Through time-sharing, security analysts could greatly increase their productivity without undergoing extensive computer training.

- The financial engineering department introduced corporate cash flow analysis programmed on time-shared computing equipment, thus a) enabling the

bank to make better loan decisions in specific instances, b) providing new marketing leads (corporate treasurers have shown interest), and c) leading loan officials to look deeper into the basic problems involved in lending.

- The economics department found time-sharing useful in preparing projections and in running regression studies to aid in measuring underlying economic cause-effect relationships.

Debugging 10 times as fast

- The research and development department began using time-sharing and discovered that it could write and run small management science applications in a way impossible earlier. Programs could be debugged in about 10 per cent of the time formerly required.

- "Our bond administration department," says Robert Parker, "is perhaps the heaviest user of time-sharing services at present." Projects underway include municipal bond coupon scheduling and pricing, automation of the quotation sheet and bond trade analysis.

- The trust department is applying time-sharing to portfolio management.

- The petroleum department used time-sharing to calculate loan analyses for gas and oil problems.

In 1967, based upon the findings of its special research team, Citibank decided to go ahead with the analytic computing center—a separate department reporting directly to the vice president of data processing. "We recognized," says Parker, "the incompatibility between the rigidly scheduled activities of a conventional data center and the essentially random time requirements in an analytic or scientific computing center."

An order was placed with Digital Equipment Corp. for a PDP-10/50, which was delivered in July of 1968. The system, which has worked out well according to Parker, and which currently is being expanded is capable of servicing eight users simultaneously and may be enlarged to handle 24 simultaneous users. This, of course, does not restrict the number of terminals since all users won't be trying to call the computer at the same time. The system includes disk, tapes (for compatibility with other systems), card reader, high speed printer and a CalComp graphic plotter.

In planning the analytic computing center, Parker points out, Citibank considered both the dollars and cents aspect and the intangible benefits.

"With 14 terminals installed," he says, "our bills were exceeding \$24,000 per month and we were experiencing an increase of one new terminal approximately every other month. It was easy to demonstrate that within a few months we would be money ahead if we developed a time-sharing capability within the bank."

But there were also several reasons apart from dollars and cents. Parker enumerates:

The end of the busy signal

"1) Response time from commercial time-sharing houses deteriorates during the peak periods of the day since they frequently have three times as many

sets in the field as they can accommodate at any one time. We intend to keep the ratio low enough so that our users will seldom, if ever, receive a busy signal.

"2) We have an in-house priority scheme of a type that no commercial time-sharing house could provide to any one customer.

"3) We will provide our users with volume storage they can't easily obtain on an off-premises machine.

"4) We have high speed print capability to allow us to undertake analyses with a high output requirement on a fast turnaround basis.

"5) We provide means for volume input which permits easy modification or substitution of data bases with new output from the data processing center or other sources.

"6) We will provide greater flexibility in terminal design than can be obtained from any one commercial service.

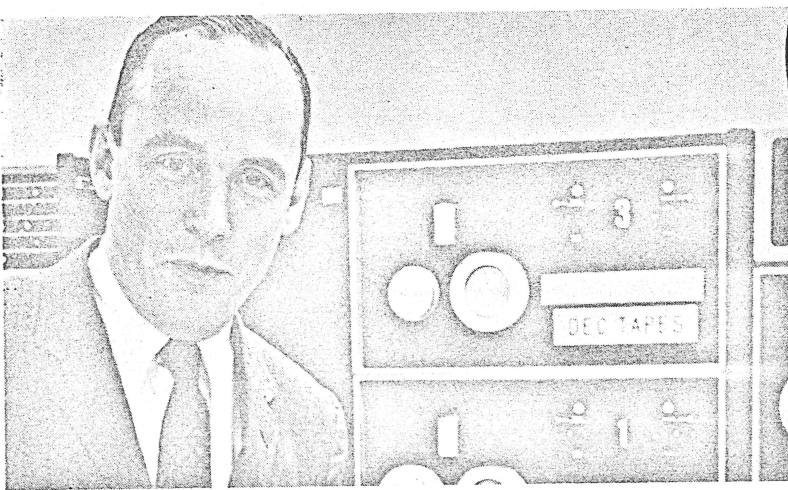
"7) We attempt to avoid the proliferation of programming languages one encounters when one deals with several different systems and computers.

"8) We provide non-programmer users with far better educational support than we could provide if a large number of services and languages were being used."

Recommends outside time-sharing for others

If First National City is convinced that it is better off running its own time-sharing service, that by no means should indicate that it condemns the outside vendor approach. On the contrary, Robert Parker advises other banks, "You will find that the commercial time-sharing services have many basic packages available that you can easily use. Initial startup costs are minimal and you are not required to give a long term commitment.

"No high degree of programming sophistication is required on the part of your people in order to use these services," he adds. "Therefore, the people in analytical areas, the people with problems to solve, should, with only a little training, be able to establish where and how time-sharing can be profitable for your bank."



BECAUSE, says Parker, eight hours of hand arithmetic can be done in seconds on the computer, "Training, experience, knowledge of the particulars, need no longer be side-tracked for arithmetic, and arithmetic need no longer be ignored."

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