

THE IMPACT OF CORPORATE EFT

You have probably been seeing much discussion of electronic funds transfer (EFT) systems in the public and trade press. Most of these discussions have dealt with consumer payment systems. But have you wondered how EFT might affect the way your organization collects its revenue, or pays its employees, suppliers, or stockholders? What might data processing management have to do, to prepare for EFT? We investigated these questions—and the answers we found are interesting. No, it does not appear that “pure” EFT will have much effect for some time to come on U.S. corporate payment systems. But on the other hand, mechanized systems are appearing that support corporate receipt and payment systems, and their use is growing rapidly. Here is a report on what we found.

There has been a great deal of public attention paid to the subject of the “checkless society”—or, in less optimistic terms, the less-check society. The concept being proposed is that of electronic funds transfer systems—EFT systems—for the automatic handling of payments. An EFT system provides not only for the transfer of funds but also for the complete identification of the transaction. This identification must tell who is paying whom—and, in some cases, for what purpose.

Most of these discussions have dealt with new consumer/retailer relationships, or perhaps new consumer/bank/retailer relationships. But in addition, there has been much concern about the consumer's potential loss of privacy under EFT. With all payment transactions recorded, and with governments (and others) possibly having access to those records, the individual stands to lose much privacy.

But it is beginning to appear that consumer-oriented EFT is not going to sweep away paper money systems, at least not in the near future. As *Business Week* recently discussed (Reference 2), there is a lot of resistance building to consumer EFT. These systems are expensive to install. Ac-

ceptance of them has been sufficiently slow that banks and retailers are now moving much more slowly toward installing them. Benton (Reference 7) is the executive director of the U.S. National Commission on EFT. He agrees that the growth of consumer EFT will probably be slow, due to the high start up costs and gradual customer acceptance. But the long range picture looks good, he says. The federal government itself can justify the expanded use of automated clearing houses, in his opinion.

In this report, we will not discuss consumer-oriented EFT. Instead, we will concentrate on corporate payment systems. It is in these corporate systems that data processing management will be most interested, we believe.

So, in this report, we will discuss the following questions relative to corporate EFT:

- What might it mean to computer-using companies?
- What is in the offing?
- How might data processing management be involved?

In our research, we attended a seminar on corporate EFT sponsored by the Bank Administration

Institute, and reported in Reference 1. We also interviewed a number of pioneering organizations, and we reviewed the literature. The best place to begin this discussion of corporate EFT is with a brief review of corporate payment systems.

Corporate payment systems

Let us consider a somewhat simplified overview of the payment system used by most organizations. First, there is a payments-in system, for collecting payments from customer organizations. Not only is there a transfer of funds involved here, but there must also be information provided by the customer of just what is being paid. The customary way of accomplishing this is to ask the customer to return a copy of the bill or invoice, or to return a stub of the invoice, along with the payment.

The next element of the payment system is the managing of the collected funds, so that funds will be available for making payments out. The function of cash management enters here. It is often the case that the organization has a short term surplus of funds—funds that will not be needed for perhaps days or weeks. Cash management attempts to put such funds to work in short term investments, so that interest can be earned. In fact, cash managers may well seek to delay the payments to the latest possible time, in order to earn as much interest as possible. Checks for paying suppliers, for instance, may be drawn on distant banks so as to increase the clearing time and hence the time that the organization may hold on to its money. This is the so-called “float” and includes the time that the payment is in the mail, plus the time that it is being processed and deposited by the supplier, plus the time that it takes for the check to clear. The management of the collected funds is thus very much a part of the corporate payment systems.

The next element is the payments-out system. This is the procedure by which the organization pays its suppliers, its employees, its shareholders, and so on. In making these payments, the organization is often required to indicate the purpose of the payment, such as by returning a copy of a supplier's invoice. Payments-out thus involve not only the transfer of funds but also the transfer of information for identifying the purpose of the payment. The procedures become somewhat complicated when, say, one check is used to pay a

number of invoices, discounts are claimed on some of the invoices and not on others, and where the money is not actually deposited into the bank account until the day when the check is expected to clear.

A corporate payments system thus involves both a means for transferring funds and a means for adequately identifying the purpose of the payments. These two requirements may be met by the use of two relatively independent systems—a funds transfer system and a message system. Or the funds transfer and messages may be handled by the same system, as proposed for EFT and as actually being done by some Giro systems. We will discuss one such Giro system later in this report.

Let us now look at what some companies are doing to improve the efficiency of their payments systems. We will start with a discussion of a mechanized message system in connection with a payments-in function.

A payments-in message system

A simplified payments-in message system has been developed by Whiteside Associates, Inc., of Lithonia, Georgia, to support the application of customer payments to accounts receivable records. A number of U.S. companies have been using this system for the past several years. Here is a brief description of how the system is being used in practice, as described by a user company at the BAI seminar mentioned above. The company prefers to remain anonymous.

This user company has an automated accounts receivable system. Also, the company uses lock box services at a number of locations around the country, to speed the deposit of customer payments. Customers send their payments to designated post office boxes. Bank personnel handle this mail, deposit the checks, and forward to the company information about those payments. It is in this forwarding of information about the payments that we are interested.

The company's results with this system have been impressive. In just about every case, the company can automatically identify the customer correctly, without having to revert to manual efforts. And in about 78% of the cases, the payments can be correctly applied to specific invoices. What about the other 22%? These are cases where the customer has paid a different amount from the invoice, due to a wide variety of reasons—such as

breakage during shipment, shortages, and so on.

The way this system works, the company invoices a customer for merchandise ordered and shipped. For some larger customers, it is in the process of transmitting the invoice data by data communications. Customers have been requested to send their payments and invoice identification data to regional post office boxes, which are serviced by banks. Personnel of these banks open the mail, deposit the checks, and perform the data entry function for the transactions. The input data includes the bank identification number for the bank upon which the check was drawn, the customer account number within that bank, the invoice number or numbers, and the amount. The bank and customer numbers are obtained from the magnetic ink (MICR) characters printed along the bottom of the check. The invoice numbers are obtained from either the check or from the voucher attached to the check. This information is recorded on magnetic tape or disk, for later transmission to this company's data processing center.

The company calculates cash discounts according to the date that payments are actually received at these lock boxes. Lock boxes are closed at 2 p.m. daily. By 8 a.m. the next day, the treasurer's department has a report of all bank account balances. The transfer of funds to consolidation accounts is handled by another system.

The payment information—bank and customer numbers, invoice numbers, and amounts—is transmitted to the company once a day, in a batch mode. The longest transmission time is about two minutes, we were told. The company maintains a file of customer identification numbers (the bank and customer account numbers), as well as the accounts receivable file. The company has developed a set of 45 algorithms, one of which is the invoice number, for attempting to apply the payments to the accounts receivable. The money algorithms consider the discounts that might be taken and the different possible combinations of open invoices, to see if an exact match of payment amount can be achieved. About 98% of the time, the customer can be identified correctly from the MICR numbers on the checks. And, as mentioned, in about 78% of the cases, the payments can be allocated to the specific invoices, with no need for manual intervention.

The system is simplified enough, said the user, to be practical in much smaller organizations

than they are themselves. They feel that the system can also be used effectively in an organization with many geographically dispersed, small retail outlets.

Avon Products Inc.

Avon Products, Inc., with headquarters in New York City, is a leading manufacturer and distributor of cosmetics, toiletries, and costume jewelry. The company has sales of approximately \$1.4 billion and employs about 27,000 people worldwide. In addition, it has over 335,000 active independent sales representatives in the U.S. and Canada and over 560,000 in other countries.

The Avon Products system that we will discuss here is one that supports the flow of funds from the U.S. sales representatives into the company's consolidation bank accounts. Two commercial systems are being used for this purpose, each with features of interest to company management.

The company's sales year consists of two-week sales campaigns, each emphasizing slightly different product mixes and prices. Sales representatives obtain orders for a two-week period and then send these orders in to their nearest regional distribution point. There are seven such distribution points in the U.S. The ordered products are sent to the sales representatives who in turn deliver them to the customers and collect the payments. At the end of that two-week period, the sales representatives send in the amount due Avon Products, by check or by money order, plus the new orders that they have taken.

At each distribution center, about 80% to 85% of the payments received each day are processed that day and deposited into a regional bank account. The other 15% to 20% of the payments received are deposited the next day. The company thus receives a high volume of relatively low dollar amount checks, which flow into these regional bank accounts.

How does Avon Products move the funds from these regional accounts into its consolidation accounts? Under the previous system, each regional distribution center used to send Telex messages to company headquarters late each afternoon. These messages gave the amounts deposited for that day. The accounting department would prepare a cash report for the treasurer's department which then had to determine just how much of the funds to retain in each regional account and how much

to transfer to the consolidation accounts at Citibank in New York City. The transfers were made using wire transfers to correspondent banks who were advised to transfer specified sums to Citibank.

Avon Products encountered several problems with this system. For instance, new balance information was not always available by the first thing the next morning, due to a variety of reasons. When this occurred, headquarters personnel had to estimate what the deposits were.

In March 1976, Avon Products began using the ChemLink service offered by the Chemical Bank of New York. ChemLink is an account balance and daily deposits and withdrawals reporting service that uses a time-sharing network which is easily accessed by the regional banks. As Avon Products has used this service, each regional bank inputs the deposit data for the Avon Products deposits, using a Touch-Tone telephone. The system provides an audio response for validating the input data. Together with the total amount of each deposit, the bank specifies the amount of immediately available funds and the amount that will require one or two more days to clear. Even though the service is provided by Chemical Bank, Avon Products still has used Citibank as the consolidation bank. More precise information has thus been available for determining the amount to be transferred to the consolidation account.

Another feature of ChemLink that Avon Products has found most useful pertains to the management of the regional bank accounts. A target balance is negotiated with each regional bank as the amount that Avon Products will keep in the account to compensate the bank for performing its services. ChemLink reports to the company each day as to the actual month-to-date and year-to-date balances at each bank, as well as the target balances for each bank. Avon Products management can thus tell each day just how well these compensating balances are being maintained.

There is another feature of ChemLink which is still under development and which, therefore, Avon Products has not yet used. This is a short term planning and forecasting model, for forecasting the flow of funds. By using this model, cash managers may be better able to anticipate the flow of funds into the regional accounts, as well as the outflow from the company's disbursement accounts. It should thus be possible to do a more efficient job of anticipating the amount of surplus funds which will be available for short term investment.

In May 1977, Avon Products began using the

Deposit Reporting Service (DRS) that is offered by National Data Corporation, Atlanta, Georgia. DRS is somewhat similar to ChemLink. With DRS, each regional distribution point (*not* the regional bank) provides the input data. An Avon Products employee calls an in-wars telephone number at a scheduled time of the day. The call is routed to the communications center of National Data, where it is answered by a National Data employee. The Avon Products employee identifies himself and his company, then gives the amount deposited for that day. The National Data employee repeats back this information, as verification. As the information is being received over the phone, the National Data employee enters it on a terminal. After the verification has been performed (with any necessary corrections made), the information is stored in the National Data computer in Atlanta. The computer pulls together the deposit information from all seven regional distribution points and, at a scheduled time of the day, transmits it to the Manufacturers Hanover Trust Bank in New York. This bank then creates depository transfer checks, for transferring the deposited amounts to the company's consolidation account. These depository transfer checks are entered into the banking system that same afternoon—and by 9 a.m. the next day, the funds are available in the consolidation account.

There are two main advantages of this system, we were told. For one thing, the transfer is triggered automatically, once the deposit information has been received in New York. For another thing, the costs of transferring funds have been reduced by substituting depository transfer checks for wire transfers.

So Avon Products is using commercial services to support the management of and the rapid transfer of surplus deposits from the seven regional accounts into the consolidation account. A separate internal system, not discussed here, is used for applying the payment data to the individual accounts receivable records for the sales representatives.

Shell Oil Company

Shell Oil Company, with headquarters in Houston, Texas, is a major manufacturer and distributor of petroleum products and chemicals. Annual sales are in excess of \$8.1 billion and the company employs some 32,000 people.

Shell is a member of the Petro/Clear clearing system, which is conducted by the Bank of the Southwest in Houston. In the petroleum industry, there is much buying and selling of crude oil and

refined products among the various producers and distributors. For instance, Shell may sell a particular grade of crude oil to Exxon on a particular day in one part of the country, and on the same day buy some crude oil from Exxon in another part of the country. Transactions such as these occur with some frequency among the leading oil companies. The monthly dollar volume of these transactions is huge. Petro/Clear was formed to make the back-and-forth payments among the oil companies more efficient.

It was in 1970-71 that the Bank of the Southwest conceived the idea of Petro/Clear. Shell was one of the founding members of the service. In concept, Petro/Clear is quite straightforward. Two successive business days are selected for each month of the year, when the clearing function is to take place. These days are selected late in the month and must be free of national and state bank holidays.

The day or so before the clearing function is to occur, each of the eleven member companies of Petro/Clear contact each other. Each of the companies has prepared a complete list of the buying and selling transactions (accounts payable and accounts receivable) with each of the other companies. The accounts payable function of one company calls the accounts receivable function of each other company and they compare their lists. Note that these lists contain only the large dollar value transactions, not any small value transactions. If there is a disagreement about an invoice, it is removed from the lists and is settled outside of Petro/Clear, but this is quite infrequent. The end result is that each company develops its *net* dollar position with respect to each other company.

On the first day of the two day clearing period, each member company transmits to the Bank of the Southwest, by Telex, rwx, or by telephone with a letter follow-up, its net position with respect to each other company. It also gives its overall net position—whether in total it owes money or is owed money. Usually the figures from the eleven companies agree, due to the checking that has been done the day or so before. If some figures do not agree, the Bank of the Southwest telephones the parties to reconcile the differences. Also, each net paying company must deposit the net amount it owes with the Bank of the Southwest, in immediately available funds. The clearing function itself takes place on the second day, and the Bank of the Southwest distributes the funds to the accounts of the net receiving companies.

Shell is generally a net payer in Petro/Clear, since it usually buys more than it sells during the year. But Petro/Clear is still desirable for them, the people at Shell feel, because it forces a discipline to reconcile accounts receivable and accounts payable on a timely basis. Petro/Clear gets the large payable and receivable items settled quickly and easily, we were told.

While Petro/Clear is specifically designed for the petroleum industry, the same concepts might well be used in other industries where companies do much buying and selling among themselves. Petro/Clear is designed for handling a relatively small number of very high dollar value transactions, and is therefore performed manually. In other situations, such as perhaps the clearing of payments among railroads, a greater degree of mechanization might be needed.

Managing funds

As the above case examples have illustrated, companies are using message systems to support the flow of funds. In one instance, payment-in information is sent to company headquarters from regional banks, which allows for the automatic crediting of payments to open customer accounts. Avon Products is using two commercial services for managing and transferring its funds from its regional bank accounts to its consolidation account. And Shell Oil Company is using a (verbal) message system for comparing its high dollar value payable and receivable items with the other members of Petro/Clear.

For the actual transfer of funds, the companies use either conventional paper checks or a conventional method of transferring funds by wire. Funds can be transferred by wire by using correspondent bank methods, or via the Federal Reserve System's Fed Wire. (We will have more to say about these transfer methods shortly.)

Perhaps the closest thing to corporate EFT in the United States is the use of mechanized systems for transferring funds within a company, from regional bank accounts to consolidation accounts. Even in this area, however, two systems are used—one for the actual transfer of the funds and the other for the supporting messages. But the end result is quite similar to proposed EFT systems, as we see it.

This intra-company transferring of funds has developed so as to better manage a company's

cash assets. The three basic principles of funds management, as we see them, are as follows: (1) collect the incoming money (receivables) as quickly as possible, (2) consolidate the collected funds rapidly and invest any funds not needed immediately in the short term money market, and (3) delay the disbursement of funds by paying bills and invoices as late as possible, so as to continue earning money on these funds in the short term money market. The somewhat-EFT-like systems that have developed in the U.S. seem to operate in accordance with these principles.

To illustrate the value of short term investments, consider the case of an organization that has \$6 million surplus in its consolidation bank account on a Friday, but will need the money on Monday to pay its payroll. Assume that short term investments will receive a 5% interest rate, which is close to the current rate in the U.S. The interest on \$1 million for one day is \$137. So the earnings for the \$6 million for three days (Friday to Monday) is \$2,466. If a cash manager can make investments of surplus funds like this many times a year, it is evident that the organization will reap a substantial additional income.

(There are some undesirable side effects from this type of movement of money into the short term money market. We will describe them shortly.)

Some fairly sophisticated procedures have been developed which tend to maximize the amount of surplus funds that an organization can invest in the short term money market. For the paying-in process, customers are asked to send their payments to regional offices or regional lock boxes. Discounts for prompt payment can be based on the date of receipt at the regional offices or lock boxes, rather than the date of mailing. Further, office procedures are set up so as to deposit these payments as promptly as possible. And if, when applying the payments to the accounts receivable file, it is determined that the customer has taken a discount that was not earned, then the customer can be invoiced for the amount of the discount.

We have discussed above some of the procedures that are being used for moving funds from the regional bank accounts into central consolidation accounts. Once in the consolidation accounts, surplus funds can be moved quickly into the short term investment market. Some organi-

zations have set up "inventory" files for keeping track of the movement of funds, as well as all short term investments. At the BAI seminar (Reference 1), one of the speakers pointed out that if a company ordered a number of funds transferred during a day, and if one of them got "lost," that fact might not be noted for two or three days in a manual system. So the inventory file should keep track of all funds transfers that have been ordered, and signal when a transfer is not completed in the allotted time. Also, a record should be kept of each short term investment, showing where it has been made, the amount, the interest rate, and the maturity date. Some short term investments can be made for indefinite periods of time; they earn interest as long as the funds are left on deposit, and can be withdrawn quickly during regular business hours.

It is in the area of paying-out, or disbursements, that the procedures can get "tricky." The procedures are aimed at maximizing the delays in the payment process, so that funds can be retained by the payor as long as possible. Delays can occur in the mail delivery process, in the processing by the payee organization, in depositing the payment in a bank account, in the bank processing, and in the clearing process. If an organization grants discounts for prompt payment based on date mailed, then the customer may choose to have one of its regional offices that is distant from the organization make the payment. This would tend to increase the mail delivery time. In addition, the payment check could be drawn on a bank that is distant from the organization, which tends to maximize the clearing time.

Some organizations have made careful studies of these delays. Knowing what the minimum delays are and what the average delays are, they can better predict when they will have to deposit funds in order to cover the accounts. The only requirement, of course, is that they deposit the needed funds in the bank accounts before the checks are presented for honoring. Further, the funds must be of the "immediately available" variety, and not subject to a clearing time, if they are deposited on the day that they are needed.

The payee organizations have some countermeasures they can take, to help offset these delays. The countermeasures are the ones we have already mentioned, in connection with the paying-in process. Customers can be asked to

send payments to regional offices or lock boxes, to reduce mail delivery time. Discounts can be granted based on date of receipt, not date of mailing. But if checks are drawn on distant banks, there is not much the payee organization can do to reduce the clearing time. Also, the payee organization can make sure that its payment receipt procedures are streamlined, so that the big majority of payments are deposited on date of receipt.

So "games" can be played between payor and payee organizations, as the payors try to slow down the payment process and the payees try to speed it up. This is one major reason why true corporate EFT is not likely to catch on rapidly in the U.S. From the accounts receivable side, EFT would be a benefit. But the cash management people, looking at the accounts payable side, will probably continue to resist strenuously any effort to speed up the payment process.

Float

Readers familiar with funds management will recognize the delay tactics used in accounts payable as the familiar "protection of float." Just what is float? We will give a brief, simplified description of it. Actually, the definition depends somewhat on the viewpoint. We will consider it first from the standpoint of a paying organization.

Assume that a paying organization (the payor) writes a check on October 12th, for the payment of one or more invoices from a supplier, and puts the check in the mail that same day. The payor's checkbook balance is reduced by the amount of the check on that day, and from a financial statement standpoint, the invoices will be considered as paid. But in fact, the check may not come back to the bank on which it was drawn until October 19th. Between October 12 and 19, the payor organization has had the use of those funds. From a cash management standpoint, the only requirement is that the funds to cover the check be in the bank account by the earliest date on which it might be presented for payment. From October 12 to 19, the payor organization can have what amounts to an interest-free loan (from the payee organization) for the amount of the check, on which it can earn interest in the short term investment market. This is the payor organization's view of float.

The banking system looks at float somewhat differently. Float to the bankers involves only the

clearing period, after the check has been deposited by the payee. It does not include the mail delivery time nor the payee's processing time before making the deposit. The funds are not yet cleared for use by the payee.

If there is one main reason why company cash managers are likely to resist corporate EFT, we gather that this would be it—they feel that they would lose their float. This is indeed an issue that stirs up strong feelings.

So important is this float to cash managers that some very sophisticated methods have been developed for increasing the float. For instance, Reference 5 presents a quite complex mathematical analysis of the problem of how to locate bank accounts so as to maximize the float.

In theory, no organization would be hurt financially by the loss in float due to immediate settlements *if* all of its customers also paid their bills via EFT. What would be lost in payables float would be made up by the earlier collection of receivables. In general, the same amount of money would be available for short term investments. In fact, in many organizations, accounts receivable can involve much larger sums of money than accounts payable—and these organizations would actually benefit by a switch to EFT.

However, cash managers recognize that they have little control over the timing of payments from customers, but they do have more control over the timing of payments to suppliers. So these cash managers probably will not accept the argument that the loss of payables float will be made up by the earlier collection of receivables, and hence will probably continue to resist corporate EFT.

A Giro payments systems

The Swedish BankGiro system (Reference 4) is an example of a service that very much resembles corporate EFT. It combines both a funds transfer system and the supporting message system that identifies the purpose of the funds transfer. Here is a brief overview of the system.

As described by Kearney in Reference 1, the term "Giro" came from the name of a bank in Hamburg, Germany in the 1600s. This bank developed a system of clearing payments among banks, by the exchange of debits and credits. All of the settlement was performed at the Giro bank. Out of this has grown the PostGiro system that is

operated by the post offices of most countries in Europe. This system is widely used for handling both corporate payments and corporate collections from the public.

In Sweden, the BankGiro system is independent of the much larger PostGiro, run by the Post Office Bank. All commercial banks, savings banks, and agricultural credit banks in Sweden (with over 4000 branches) cooperate with BankGiro. BankGiro was first put into operation in the early 1950s and has been revised to adapt to modern technology. It is still largely a paper media system but apparently it could be adapted readily to EFT.

Each company in Sweden that uses BankGiro is assigned a BankGiro account number. This identification number is printed on all invoice forms.

When a payor organization wishes to pay a group of open invoices, it groups these invoices by supplier. The organization fills out a form that lists, for each supplier, the invoice numbers and the amounts that it is paying. Each supplier is identified by its BankGiro account number. The organization then sends this listing, together with one check or debit order to cover all of the invoices, to its local bank. The local bank deducts the total amount of the check or debit order from the organization's account and then sends the documentation to BankGiro. BankGiro then (1) sends funds transfer messages to the appropriate banks, to cause the credit (deposit) of the funds in the payee accounts, and (2) sends credit notices, invoice numbers, and amounts to the payee companies.

BankGiro has developed procedures for collecting payments from the public, using turnaround documents. It can also handle payments to organizations that are not members of BankGiro. Further, it can handle the direct deposit of payroll to employees' bank accounts.

So the Swedish BankGiro system, while it is not yet a true EFT system, has many of the characteristics of a corporate EFT system. Acceptance has been good, with over 350,000 account numbers issued and with volume growing at over 12% yearly.

With Giro systems in use throughout Europe, we would expect that the use of systems like the Swedish BankGiro will spread fairly rapidly. Corporate EFT systems would thus seem to be more likely in the not-distant future in Europe than in the U.S.

Substantial progress has been made in Japan also, in the mechanization of the banking systems. We discussed in our April 1973 issue how a payor, instead of sending a check to a payee, can tell his branch bank to transmit an amount of money to the account of the payee in another branch, and even in another bank. For consumer EFT, over 7,500 automatic cash dispenser terminals had been installed by mid-1976 and over 30 million cards had been issued for using these terminals.

Thus, while both consumer EFT and corporate EFT may be resisted in the U.S., both are rapidly gaining ground in some other countries of the world.

Supporting cash management

Numerous developments in the U.S., in addition to the ones discussed above, are taking place in support of modern cash management. For instance, Merrill Lynch & Co., the holding company for the largest stock brokerage firm in this country, has entered into an interesting arrangement with the City National Bank of Columbus, Ohio. Under this arrangement, brokerage customers can borrow, write checks, and make Visa credit card purchases against funds held in their brokerage accounts. Also, some savings and loan associations are allowing depositors to make credit card purchases against their savings accounts. And in New England, interest bearing checking accounts are already permitted. All of these developments tend to siphon money out of regular demand deposit checking accounts and put it into interest earning accounts.

The U.S. Federal Reserve system seeks to control inflationary and deflationary pressures by controlling the supply of "transaction money." Transaction money is defined as currency in circulation plus demand deposits. But there are other, somewhat less liquid forms of money that the Federal Reserve does not pay as much attention to. This is money in the various types of savings accounts. This latter money, in the past, has had to be withdrawn from the savings accounts in order to make it transaction money. As we have just indicated, though, that picture is changing. Some of the less-liquid money is becoming transaction money.

These U.S. developments, then, are in support of modern cash management. They allow both individuals and organizations to keep transaction-

type money in interest bearing accounts.

We have discussed the concepts of modern cash management as if it were beneficial to all concerned. As far as the individual organizations that practice this cash management are concerned, the results *are* good. But as Rose (Reference 6) points out, there can be some very negative side effects which may have a profound influence on society.

For one thing, says Rose, the rapid movement of funds from regional bank accounts to consolidation accounts and thence to the short term money market results in an increase in the velocity of money. The net effect of this is to increase the supply of money, which can be inflationary. The Federal Reserve Board will have a more difficult time in controlling the supply of money. The Board may find that it has to constantly reverse its decisions, which also is not good. Inflation thus may be harder to control as this type of funds management spreads.

The second main problem, according to Rose, is that the smaller banks will tend to lose deposits, as companies transfer surplus funds to consolidation accounts. Already there are "rumblings from the hinterlands," according to Rose, as the smaller banks plead for protection from the loss of funds.

The combination of these two side effects of modern cash management may require Congress to amend the banking law of 1933, which prohibits interest payments on demand deposits. Such interest payments may have to be allowed and bills have been introduced in Congress to accomplish this. With demand deposits earning interest, there would be less incentive to move surplus funds out of the local banks. The velocity of money would be reduced and inflationary pressures eased. Of course, because of the added expense of these interest payments, the banks probably would impose fees on all transactions—the transactions that are now "free."

Even with such legislative changes, organizations will still want to manage their funds more effectively. We see several ways in which both in-house and outside computer services can support funds management. These are: (1) payment-in message systems, (2) funds transfer systems, (3) funds inventory systems, and (4) balance reporting systems. We will discuss each of these briefly.

Payment-in message systems

Assuming that an organization receives payments at regional offices or at lock boxes serviced by banks, the organization will need to get two types of messages. These are: customer and invoice identification messages, and deposit amount and availability messages.

Customer and invoice identification. This is the information that is needed by the accounts receivable function of the organization. It is used for applying customer payments to the accounts receivable file. In an ideal system, the following types of information probably would be desired, to be transmitted from the point of receipt of a payment to the processing site: (1) customer identification, (2) identification of all invoices covered by this payment, (3) amount of each invoice, (4) any discounts taken, (5) any adjustments taken and reason code, and (6) net amount paid. In some situations, it may even be necessary to identify individual line items on an invoice, as payments may cover just certain line items and not the total invoice.

In general, it is not feasible for U.S. organizations to expect to receive this amount of detail in connection with payments, in today's environment. The payments-in system described above requires that only the customer's MICR number, the amount paid, and possibly the invoice number(s) be transmitted. Consequently, a rather complex set of procedures must be used for trying to determine how many invoices have been paid, what discounts have been taken, and so on. In a lock box type of service, this might be all the information that it is reasonable to expect.

In the absence of standards, each organization will have to work out suitable methods for obtaining customer and invoice identification.

Deposit amount and availability. This information is needed by the cash management function of the organization, usually handled under the treasurer of the organization.

Cash managers need to know just how much of the day's deposits are immediately available funds. To be immediately available, deposits would have to be in cash, or cashiers checks, or drawn on the same bank in which deposited, or such. Typically, however, deposits consist of checks drawn on other banks. Sufficient time must

be allowed for the checks to clear, to assure that there are adequate funds in the accounts to pay the checks. The U.S. Federal Reserve System has established standard one-day and two-day clearing times.

Thus, cash managers want to know just how much of the day's deposits are immediately available, how much will be available the next day, and how much will be available two days hence. The cash managers can then determine how much of the funds can be transferred to consolidation accounts and when.

We have mentioned two commercial services earlier in this report that are used for transmitting such information—ChemLink and Deposit Reporting Service. Readers interested in such services would do well to contact their banks for more information.

Use of funds transfer systems

Funds transfer systems are used mainly by the cash management function of an organization. In general, too, most organizations will make use of the funds transfer systems that are available through their banks. Data processing managers may be asked to develop systems that interface with these funds transfer systems.

Basically, funds move within the banking system by way of the "correspondent bank" principle. If two banks find that they have a good amount of back and forth business, they open accounts with each other and deposit funds with each other. One bank can then transfer funds to a correspondent bank by simply advising that other bank to "take the funds out of the account we have with you."

This relationship can be (and is) set up not only between individual commercial banks but also between commercial banks and the Federal Reserve system. Thus funds can be transferred from one commercial bank to another by way of the Federal Reserve bank with which the first bank deals. From there, the funds are transferred to the Federal Reserve bank with which the second bank deals, and finally to the second commercial bank. The Federal Reserve system thus provides a mechanism (for a fee) by which a commercial bank can transfer money to any other commercial bank.

In actual practice, the banking system uses a process of daily clearings, netting the debits and

credits between any two banks. Each bank groups the checks that have been deposited with it that day, with the groupings based on where the funds must be collected. Some funds will have to be collected from correspondent banks and other funds will have to be collected via the Federal Reserve system. Only the net amounts of debits and credits are actually transferred. Further, the bank in which a check is deposited considers that check to be good after the official clearing time has passed, unless the check is returned for some reason.

The correspondent bank relationship can be extended to a group of banks. This allows for ease of transfer within the group, without the need to go through the Federal Reserve system.

One mechanism of transfer is by depository transfer checks. These are paper checks that are written by, say, a consolidation bank to draw funds out of regional banks. If written by the consolidation bank on one afternoon and put into the regular clearing process that same afternoon, the funds generally will have cleared into the consolidation bank the next day. Still another transfer service is the New York Clearing House Interbank Payments System, which transfers some \$58 billion per day among 11 member and 58 associate member banks.

The regular transfer system just described works on a batch basis, on a daily schedule. Where a greater speed of transfer is desired, transfers of individual items by wire can be used. A number of "wire transfer" services are available to banks. The Federal Reserve service, called Fed Wire, can be used for the wire transfer of funds from any U.S. bank to any other U.S. bank. In principle, the system works as described above, but for individual items. The Bank Wire system is a private wire network serving over 200 member banks, all essentially having a correspondent bank relationship with each other.

On the international scene, the SWIFT (Society for Worldwide Interbank Financial Telecommunications) is an international network for moving funds across national boundaries. At present, it involves nearly 500 banks in Europe and North America. It began pilot operations early this year. It uses a standard international format for messages. The messages can involve customer or bank transfers of funds, foreign exchange transactions, and so on. It is expected that SWIFT will be expanded to connect to banks in other parts of

the world, for worldwide funds transfers, and have link-ups with automated clearing houses.

Yet another transfer service comes close to being an EFT system. This is the "third party" wire transfer system being offered by National Data Corporation. It began operation in March of this year in New York City. It allows a corporate customer to initiate wire transfers of money via a terminal in the customer's office. A message is sent to the customer's bank which, after approving the transfer, performs the transfer over Fed Wire or Bank Wire.

There are now 32 Automated Clearing Houses in the U.S. These also come very close to being EFT systems. They provide for both funds transfer and for the necessary supporting identification messages. The ACHs are being used for the direct deposit of payroll payments and Social Security payments, for instance.

We suspect that many of the larger companies will want more control over the transfer of funds. That is, they will want to initiate the transfer of funds directly from terminals in their offices. Data processing management may be asked to develop systems to interface with funds transfer services.

A very important feature of any funds transfer system is security. Impersonation or the unauthorized diverting of funds must be protected against, or else huge losses could occur. Funds transfer systems probably will need high quality, end-to-end encryption, with excellent protection of the encryption keys.

A funds inventory system

A funds inventory system would be used by the cash managers of an organization, for keeping track of the status of all funds.

First, there is need to keep track of all funds in regional bank accounts. The availability of the funds in each account should be known, relative to "today's" date. The information would be supplied by the payments-in message system. Also, the performance of the actual balances versus target balances is desired, for each of the accounts.

Next, funds probably will be transferred each working day from the regional accounts to one or more consolidation accounts. There may be many such transfers daily, a number of which may have duplicate amounts. Means are needed for keeping track of all transfers that are initiated, to make sure that all are consummated and to track down

any that get "lost."

Next, an inventory of all of short term investments is needed, to show where the money has been invested, the maturity or availability of the funds, the amount, and the interest rate.

Finally, funds managers need to know the actual account balances in the disbursement bank accounts—the accounts from which expense and payroll payments are made. These account balances figures can be supplied daily (or as required) to the funds inventory system by a balance reporting system.

In addition to a funds inventory, it would be desirable to have a funds requirement system. Such a system would indicate the expected need for funds, showing how much will be needed when and where. The need could be based on historical patterns of funds usage plus any specific future needs that are known. Such a system would help cash managers determine how best to move their funds.

We suspect that some data processing departments will be asked to develop funds requirements and inventory systems, for the better management of corporate funds.

Balance reporting system

It is clear that to efficiently manage its funds, an organization needs to know the actual balances in its various bank accounts at all times. This need is particularly challenging in the case of disbursements accounts. These accounts are often geographically dispersed. In addition, the timing of the withdrawals from these accounts is somewhat unpredictable, as it depends on when the payees actually deposit the checks.

National Data Corporation in Atlanta, Georgia, offers a commercial balance reporting service. Customers instruct their banks to transmit daily to National Data the actual balances and daily activity totals of the customers' accounts. The daily activity totals include total deposits and total withdrawals, so that the new balances can be tied back to the old balances. This information, for all of the customer's bank accounts, is consolidated in the National Data computers. The customers can have this consolidated data transmitted to them on a scheduled basis, or they can retrieve it over the National Data network, if they desire.

So here is another area in which the data processing department may be asked for help—for setting up an in-house system for interfacing a funds inventory system with a commercial balance reporting system.

Conclusion

It appears that we in the United States are not likely to see the rapid growth and widespread use of true EFT systems in the next few years. Yes, the computer manufacturers are pushing hard on this, and the banks seem to be very much in favor of EFT. And there is a federal commission on EFT that is studying the subject and has made recommendations to the President and to Congress. But the costs of consumer-oriented EFT are very high and it is not yet apparent that the necessary volume of transactions will materialize to make these systems pay. And corporate cash managers are wary of corporate EFT systems, as such systems seem to threaten float.

As long as banks do not pay interest on demand deposits, more and more organizations probably will move toward the type of cash management system described here. But even if banks *do* begin to pay interest on demand deposits, we suspect that organizations will still want many of the elements of these cash management systems. The transfer of funds would be reduced. But it would still be necessary to transfer funds from, say, "holding" accounts to disbursement accounts.

The end result of these funds management support systems will be something quite similar to corporate EFT. However, this end result probably

will not have the immediate settlement feature of EFT systems.

In the U.S. environment, the development and installation of such funds management support systems may pose a challenge to data processing management. The reason is that each organization will have to design and build its own systems (or select from among the commercial offerings). In the absence of standards, it will be hard to interface such systems with those of customers, suppliers, banks, and commercial services. Since substantial amounts of company funds can be involved, system errors and security threats can be very important. These problems will, in general, be solved on a company-by-company basis.

In countries where EFT systems are appearing, it would seem that the challenge to data processing management will be less. Standard payment systems, plus standard formats and codes, will be used. It should be easier to interface any internally designed systems to the EFT systems because of these standards. Of course, there will be the usual but non-trivial problems of adapting the organization's procedures to the new standards.

U.S. multi-national companies will be required to operate in both environments, surely. This means that multi-national data processing executives will have to become familiar with corporate EFT sooner than will domestic data processing executives.

In any case—true corporate EFT or not—work on improved funds management systems would seem to be in the future of most data processing departments.

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In the early 1970s, IBM began to market a group of programming aids called IPTs—Improved Programming Technologies. These technologies included top-down development, structured programming, chief programmer teams, HIPO, development support library and structured walk-throughs. In addition, IBM offers a COBOL interactive debugging facility on TSO. Next month, we will report on some user experiences with these techniques and see how they have been adapted and modified to fit different needs. Most of them are independent of the brand of computer used, of course.

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