

A DECISION FRAMEWORK FOR
CONSUMER-ORIENTED ELECTRONIC FUNDS TRANSFER SYSTEMS

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ABSTRACT

The American payment system whereby exchanges of value are transacted between participants is currently undergoing change. The large volume of paper-based transactions continues to increase as does the cost of processing these transactions. Recent advances in the computer and communications fields offer an alternative to this paper-based system. This alternative has been dubbed Electronic Funds Transfer System (EFTS) and it takes various forms. In the first part of the thesis the current payment system is examined. Then the various forms of consumer-oriented EFTS are presented. These are:

- 1) On-line branch banking
- 2) Pre-authorized debit and/or credit systems
- 3) Automated Teller Machines
- 4) Point-of-Sale equipment

Various factors that would help a particular bank to determine which EFTS options, if any, are likely to mesh with their particular market.

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CHAPTER 1: INTRODUCTION

Statement of Problem

The banking industry is at a crossroad. Top management is being forced to make long-run strategic decisions concerning their investment in EFTS. These decisions are being made in a haphazard way; there have been some notable successes and failures. A savings and loan institution in Nebraska has succeeded in establishing a Point-of-Sale (POS) system whereby the cash registers in a local supermarket chain are linked to the institution's computer. Consumers are thus able to deposit or withdraw money from an interest-bearing account while they pay for their groceries. On the other hand, the Bank of America recently announced that their experience with Automatic Teller Machines (ATM) had been an unprofitable one, and they have consequently curtailed further activity in this area.

Mostly, however, there has been a lot of activity as banks scramble for position in EFTS development. A recent study by the Payment Systems Research Program (PSRP) surveyed the 500 largest commercial banks, the 200 largest savings and loan institutions, the 100 largest savings banks, and 175 large credit unions in an attempt to get an overall picture of EFTS development. Of those responding, 95% of all bank marketers predicted they would offer a debit card by 1980. About 95% of all financial institutions stated they would become involved with a POS system within the next five years.¹ It must be noted that joining the

EFTS race usually requires large capital outlays. This fact, coupled with the long-term nature of the decision underscores the importance of making the right decision.

We propose to examine the methodology which should be adopted by banks considering consumer-oriented EFTS. We will first survey the EFTS alternatives and then develop a set of selection criteria for different types of banks.

Work Done Previously

Most of the work done previously in EFTS can be roughly categorized as either dealing with technical issues or providing a survey view of EFTS. The survey-type studies present and describe all or some of the various forms of EFTS. Studies addressing technical issues generally assume that the basic decision as to which type of EFTS should be implemented has already been made.

The archetypical study of the survey type is the one done by Arthur D. Little, Inc. for the National Science Foundation in 1975. This study, entitled "The Consequences of Electronic Funds Transfer," introduces most of the relevant EFTS issues. The report begins by analyzing the concept of a payment system and how the payment system currently operates. They then present various alternative payment systems that could develop as a result of advances in computer and communications technology.

An example of a technical, specialized study is the one carried out by the Bank Administration Institute entitled "An Electronic

Network for Interbank Payment Communications." This study looks at the banking structure and the check collection system and culls several factors that determine the design of an interbank network. The network structure that is adopted is a message switching system and this system is then superimposed on the current banking structure.

Particulars of Our Effort

It is our contention that the current research on EFTS has not fully addressed the issue of transition. While it may be true that a payment system superior to the one currently in operation is feasible from a technological viewpoint, it is just as true that the world will not stand still while the system is built. In other words, the "less-check, less-cash" system will evolve from the current system. We address the issue of how a particular bank in a particular market should approach the strategic decision of how to allocate its EFTS efforts. We do this by suggesting a prescriptive methodology which will attempt to match a bank's individual characteristics to the various EFTS alternatives open to it. These alternatives we have classified as:

- 1) On-line branch banking. In this system, account balances are kept on-line and they may be accessed via a terminal at the branch.
- 2) Automated Teller Machines (ATM). These machines primarily dispense cash but also accept deposits and can make transfers between accounts. They are unmanned and serve to extend

banking hours. In some jurisdictions they are allowed to be located at some distance from the branch.

- 3) Pre-authorized debit/credit systems. In a pre-authorized debit system, the customer instructs the bank to make payments to specified third parties by directly debiting the account. In pre-authorized credit systems, certain recurring payments such as payroll or Social Security payments are deposited directly into the customer's account.
- 4) Point-of-Sale (POS) system. This system entails having a terminal at the merchant location which is directly connected to the branch. A customer making a purchase at the merchant location has his account debited and the merchant's account credited at the time of purchase.

In reaching a decision as to which type of EFT system or systems a particular bank should adopt, we think the following factors are relevant:

- 1) Type of bank
- 2) Check processing volumes and transaction profile
- 3) Number and concentration of branches
- 4) Technolgoical constraints
- 5) Competitive pressures
- 6) Legal and regulatory issues.

These factors and their relevance to the EFTS decision will be fully discussed in Chapter 4.

Thesis Structure

We have divided the study into five chapters:

Chapter 1: Introduction

Chapter 2: Current Banking Environment -- a discussion of how
the payment system currently operates

Chapter 3: Consumer-oriented EFTS -- a discussion of the
various alternatives presented above

Chapter 4: Factors Affecting the EFTS Strategy Decision --
analysis of the factors that aid in determining
EFTS development for a particular bank

Chapter 5: Conclusions.

CHAPTER 2: THE PRESENT PAYMENTS SYSTEM

Since electronic funds transfer systems had been heralded as eventually being able to bring about a checkless/cashless society (the currently used terminology tends to be less check/less cash) and checks and cash are the cornerstone of the present payments system, it is important that we have an understanding of the present system. This chapter will describe the present payments system. It will basically investigate three different aspects of the present payments system: first, the role of the depository institution in the payment system; second, the forms of value exchange that are used in the present payments system; and third, the forces within the present payments system that are working either for or against the inclusion of EFTS as a form of value exchange in the payments system of the future.

Role of the Depository Institution

In any discussion of the present payments system, it is important to look at the function that must be performed by the depository institutions in order for the payments system to work smoothly and efficiently. The functions that have traditionally been performed by depository institutions are the intermediation of financial resources, the serving as depositories of wealth, the creation of money and the operation of payments systems.

Intermediation of financial resources is the process of establishing a market place for those who are net savers and those who seek to borrow money. This is accomplished by taking deposits from the savers in return for interest or services rendered. The proceeds in excess of required reserves are then loaned to those who wish to borrow in return for the payment of interest to the depository institution. The deposits used may come from deposits by individuals, corporate certificates of deposits, or the issuing of commercial paper or bonds.

The depository function of these institutions is the provision of a means by which wealth in the form of money, credit, and valuables can be stored safely. There are two basic types of monetary depositories: time depositories and demand depositories. Time depositories are those that accept deposits that, once made, need not be returned or made accessible to the depositor without penalty until some minimum time has passed. Demand depositories are those in which wealth may be stored for a short period of time and may be entered, accessed, or transferred at any time.

The capability of depository institutions to "create" money is characteristic of most banking systems and in the United States is limited by the fractile reserve requirements imposed on most banks by either the Federal Reserve System or state banking authorities. The phenomenon of banks 'creating money' is the result of the banks being able to lend the same money out several times by the following process: first, a sum of money is deposited in a bank; second, the bank lends out that money after

satisfying the fractile reserve requirement (currently 15% of demand deposits of commercial banks regulated by the Federal Reserve Bank); third, the borrower deposits the proceeds of the loan with a bank that, after meeting reserve requirements, can lend out the money again; and fourth, this depositing, lending, redepositing process continues until the entire sum is required to meet needed reserves.

There are currently two payments systems that are operated by the depository institutions. The first is the check payments system and the second is the bank card payment system. Both are discussed in detail later in this chapter. For now, it will suffice to say that both are methods by which the name and reputation of the bank allow one of its depositors to transact an exchange of value in which he gives the third party a single piece of paper stating the amount of value exchanged. On the basis of this paper, the bank will pay the third party and collect from the depositor by either debiting his demand deposit account or billing the depositor.

Value Exchange under the Present Payments System

The American payments system is dominated by the use of cash and checks as mediums of value exchange. These two media account for almost 98% of the number of annual transactions in the present payments system. Most of the remaining transactions are performed using a credit or bank card. When credit cards are used, there is more than one transaction for an exchange of value. These three forms of payment (cash, check, and

credit or bank card) account for well over 99% of the annual number of transactions within the payments system and will each be discussed in detail. The remaining fraction of one percent comprises transactions carried out by means of bank drafts, letters of credit, travellers' checks, the Bank Wire, and the Fed Wire. While these forms of value exchange account for only a small number of the transactions, they tend to be larger in size dollarwise than the other forms and therefore account for a disproportionate share of the dollar value of all transactions. However, since the benefits of EFTS accrue from reducing the number of transactions rather than the value, these forms will not be discussed further.

As of July 31, 1976 approximately \$88.95 billion in cash was in circulation consisting of \$9.28 billion in coins and \$79.67 billion in currency (see Table 2-1). This figure excludes amounts held by the U.S. Treasury and by Federal Reserve Banks.¹ U.S. currency in circulation has increased at an annual rate of 7.6% since 1965 and on a per capita basis, the annual rate has been 6.6% since 1965. This growth has occurred in spite of the parallel increase in the use of checks and a large increase in the use of credit cards. This amount of currency represents only 29% of the total (narrowly defined) money supply of 304.8 billion.²

While cash represents only a small percentage of the money supply it is used in 87% of all transactions in the payment systems and 98% of all transactions of \$10 or less. Very little cash is held by nonfinancial firms: intercorporate payments are virtually never made in cash and

Table 2-1
 Currency Bills in Circulation -- July 31, 1976

<u>Denomination</u>	<u>Number of Bills</u>		<u>Value of Bills</u>		<u>%Growth in Value</u>
	<u>(thousands)</u>	<u>(%)</u>	<u>(\$ millions)</u>	<u>(%)</u>	<u>1971-1976</u>
1	2,687,405	40.7	2,687.4	3.4	13.9
2	313,210	4.7	616.4	.8	356.6
5	725,731	11.0	3,628.6	4.6	13.9
10	1,020,746	15.5	10,207.5	12.8	9.4
20	1,431,440	21.7	28,628.8	35.9	43.3
50	170,242	2.6	8,512.1	10.7	61.5
100	250,116	3.8	25,011.6	31.4	89.3
500	346.8	-	173.4	.2	-15.0
1000	201.3	-	201.3	.3	-15.1
5000	0.38	-	1.9	-	- 5.0
10000	0.37	-	3.7	-	- 7.5
TOTAL	6,599,438.9		79,672.7		

Source: Monthly Statement on United States Currency and Coin

retailers try to minimize the amount of cash kept in their cash registers. Approximately 25% of the currency in circulation is held by firms of any type. The remaining 75% is held by individuals and tend to be the main form of payment.

The household sector's high demand for currency is based on four broad factors. First, currency is used for small purchases, such as vending machines, lunch, small retail purchases. For these small purchases, the service charge and inconvenience of writing a check make cash the preferred means of payment. For transactions such as vending machines it is the only possible form of payment. A second factor for using cash occurs when a check or credit card is not acceptable to the seller. This might result from a number of reasons such as a person's being from out of town so that both the individual and his bank are unknown. The third factor is the anonymity of the cash transaction. This makes cash particularly suited for private transactions or illegal transactions where a check could provide evidence for the police or tax collector. The final factor is that many people find the use of checking account to be expensive and/or inconvenient. 25% of American households have no checking account.³

Although they are fairly invisible to the everyday user of cash, there are fairly large costs involved in the cash transactions portion of the present payment system. The first cost in the currency area is the approximately \$50 million that it costs the United States Government each year to produce new bills and coins. Other costs associated with

cash transactions include: the distribution, cleaning, and destruction costs of cash; the cost of protection systems such as safes, vaults, armored cars, and security services; insurance costs; handling costs by cash register operator, teller, money packages, and others; the private costs of cash theft such as the value of the stolen money, injuries suffered and the inconvenience caused by the theft; the business costs of cash theft including the value of stolen money, the loss of income due to business disruption and payments made to avoid theft; losses due to counterfeiting; and the police force and penal system costs that are attributable to cash theft and counterfeiting. It is important to note that most of these costs are not linear with usage of cash since they are more location-oriented than amount-oriented. Therefore, if EFTS was to halve the number of cash transactions, one would expect that the percentage decrease in cash transactions cost would be significantly less than 50%, probably in the range of 10 to 25%.

In their recent study on EFTS, Arthur D. Little, Inc. (ADL) note that while 11% of all transactions in the current payments system are handled by checks, checks account for 96% of the dollar value of all cash, check, and credit card transactions. ADL further estimates that there were 28 billion checks processed in 1974 and project check volume in 1980 to reach 45 billion checks. Recent estimates of the costs of check processing range from \$.16 - \$.21 per check. Since the labor content of check processing is relatively high, it is probably safe to assume that these costs will continue to increase.

Since EFTS are aimed at replacing many of the functions currently performed by the check processing system, we think it is important to have a clear idea of how the check system works. Figure 2-1 is a diagram showing the different steps involved in the processing of checks. These steps will be explained below.

Checks enter the bank's input stream from two different sources: 'clearing' items and 'over-the counter' items. Clearing items are checks drawn on the processing bank that have been received by different banks. The processing of clearing items will be discussed later. Over-the-counter items are those that are received by the bank's branches. They are subdivided into 'paid checks' and deposited items. Paid checks are those that were exchanged for cash at the branch. Deposited items include a deposit slip together with cash and/or checks(s). These items are encoded so that they may be read by a magnetic ink character reader (MICR). Each check will already have a bank number and an account number on it and the clerk will key in the amount of the check. In the case of deposit slips, the account number may have to be added as well. Additional information may be coded on the deposit slips. While bank systems vary on this point, the main purpose of the additional information is to place a 'hold' on uncollected items. That is to say, if a customer deposits checks in his account, the bank may prevent the money from being used until it is sure that the checks will be collected. If the deposited checks are drawn on another bank, this 'hold' may last for several days. Once the checks are MICR encoded, they are prepared for

input to the reader/sorter. An optional step at this point is the micro-filming of the checks although many banks perform this step later on in the process.

At this point it is best to explain the processing of clearing items which has been taking place. Clearing items are those items that have been collected at other banks and are delivered to the payor's bank. There is very little processing associated with incoming clearing items since these are already MICR encoded. The only handling that takes place consists of verifying that the dollar amount of the checks agrees with the delivering bank's total. This process is made easier since the checks are tied in bundles and only the bundles are added. Many banks choose to microfilm the checks at this point. After this, the clearing items are sent to the reader/sorter where they join the over-the-counter items for further processing.

At the reader/sorter station items are input in runs of 5,000-10,000 items. The functions of the reader/sorter at this point are to capture all the information on a magnetic tape usually known as the all-item file (AIF) and to physically segregate the checks by bank. A printer then outputs a listing of all the checks that were received for each bank for this run. These listings are called 'cash letters' and these are then attached to the physical bundle of checks that is to be sent to each of the different banks. There is also a reconciliation process, manual or automated, since the reader sorter rejects 2% - 3% of all the items input. The reader/sorter runs continue until all items have been read in.

The bundles of checks drawn on other banks are bagged so that they may be distributed among the different banks. This outgoing clearing becomes part of the incoming clearing for each of the different banks. The checks drawn on the processing bank ('on-us items') are sorted off-line by account number so that they may be filed and sent to the customers with their monthly statement.

From the AIF a subsidiary tape is extracted that contains all of the processing bank's transactions. This tape is sorted by account number and is then sequentially processed with the account master file. The most important reports emanating from this processing are the trial balance, which lists the balance for each account and the Not Sufficient Funds (NSF) report, which lists all checks whose accounts do not have enough funds to cover them. These reports are distributed throughout the branches. After deciding which checks are not going to be honored, it is necessary to pick the checks from the files so that they may be returned to the payee.

It is significant to note at this point that while the check processing system is long and complex, it has been institutionalized. Thus, there will be a natural resistance to change unless it can be shown that there is a clearly superior alternative.

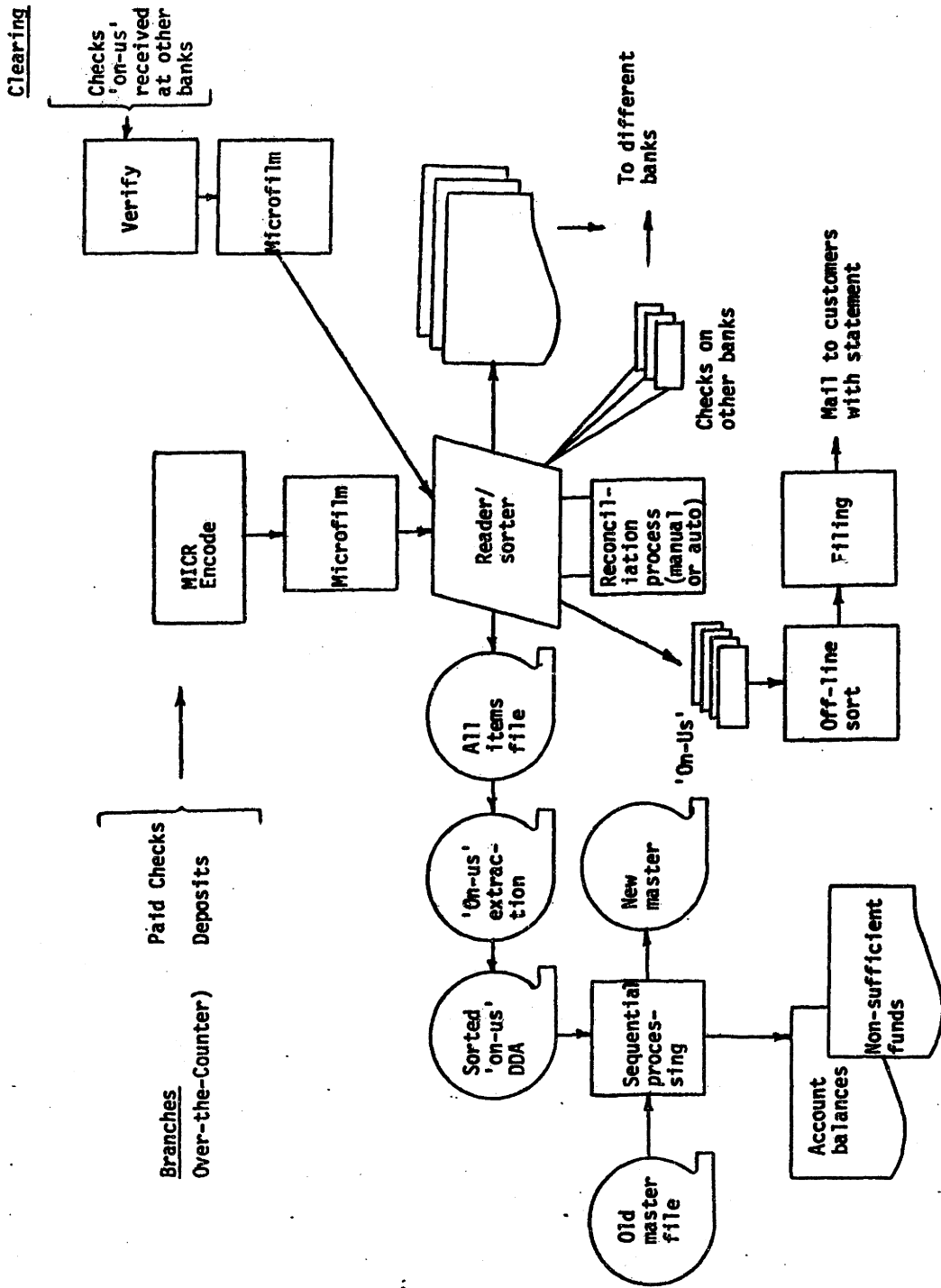


Figure 2-1

The past twenty years have seen a dramatic increase in the number of transactions performed with credit cards. The credit card system has expanded to the point where there are thousands of different cards outstanding. Credit cards account for approximately 5 billion transactions annually.

Data about the use of credit cards is normally gathered in terms of card type: bank credit, travel and entertainment, oil companies, retailers, rent-a-car, air travel, and others. However, in the National Science Foundation's report prepared by Arthur D. Little, Inc., they use a classification that is better suited to a discussion of EFT. This breakdown is into bank cards, national independent cards, national private cards, and local private cards.

There are two major national bank cards: the BankAmericard and the Master Charge card. Each is issued by a local bank under franchise from the national bank card organization. In each system, key banks or regional associations handle most of the sales slip clearing operations. Both systems currently have credit verification networks in operation.

The issuing banks justify their participation on the basis of profit; the profits arise from merchant fees and interest on unpaid cardholder balances. However, some banks have taken up to five years to attain a profitable position and others never have.

Bank cards are of particular significance in a discussion of EFTS because in their operation exists the relationship between the provider and the general payments system. Both national bank card organizations

have already become involved in EFTS by issuing so-called debit cards that decrease the cardholder's balance at the time of the transaction.

The national independent cards are important because they compete directly and broadly with the national bank cards. Their drawback is that they are issued by parties that are less directly connected with the operations of the present payments system. The major national independent national credit cards are Diners' Club, American Express, and Carte Blanche, all of which originated before the major bank cards. The issuing organizations view their credit card operations as a profitable business with their profit coming from the same two sources as the bank cards; merchant discounts and interest on unpaid balances.

The national private credit cards cover a large number of card issuers including the oil companies, car rental organizations, airlines, and major retail chains. These cards are different from the first two categories in two important aspects. First, they are, in most cases, of value only at the issuers' locations rather than a variety of locations. Secondly, the original objective of these cards was not profit but position in a competitive market. Few of these cards are profitable for the issuer but are seen as a service that it is necessary to offer.

Local private credit cards are employed primarily by large retail establishments such as department stores and discount houses. The prime motivation of these cards has been market competition and the simplification of the billing and receipting process. Profit has had a secondary position behind the card's use as a marketing

Regardless of the type of card, their use is on rise. As of 1973 over 50% of all American households actively used at least one credit or bank card. Use of credit cards increases with income and the level of education of the head of the household.

Most credit cards offer two types of credit: convenience credit and installment credit. Convenience credit allows the cardholder to pay for purchases with his credit card and if he pays the entire balance on his card at the next billing date, he pays no interest or service charge. This basically equals an interest-free loan for up to 45 days. Installment credit is when there is a carried over balance on which the cardholder pays interest. Convenience credit is the major factor contributing to the low profitability of most credit cards. It is also a portion of credit card usage that could be entirely replaced by EFT.

There are many reasons for an individual to use a credit card. First, they are convenient to use. Second, there is less fear of robbery than with cash. Third, the intelligent cardholder has more opportunities to exploit float. Fourth, there is a certain prestige in being a cardholder. Finally, the use of a credit card gives the user more accurate and convenient records of purchases.

The use of credit cards brings high per item costs to the present payment system. It is estimated that every credit card transaction costs fifty-five cents to process. The components of this cost include: the merchant accounting, processing and billing costs per transaction; the cost of sale authorization; and the cost of fraud and credit loss. It

is estimated that the total cost to the payment system of credit card transactions is \$2.76 billion per year.⁴

There are the major components of the present payment system. Together they represent an estimated annual cost of almost fourteen billion dollars. This cost has been steadily growing as the number of transactions in the payments system has increased. It is hoped that EFT will be able to stop this growing cost.

Forces within the Payment System That Affect EFT

The present payments system has evolved over a period of time as the result of the dissatisfactions with prior systems and of changes in the cultural and technological environment. EFT is seen as a major change in the technological environment. However, no one has yet been able to develop a priori economic justification for the inclusion of EFTS as part of the payments system. This section will take a quick look at the dissatisfactions with the current system and see if EFT will solve these problems.

Individuals as a group seem to be well satisfied with the present payments system. The two largest concerns of individuals are the risks of using cash and the small inconveniences of using checks such as the time it takes to write a check and the inability to use personal checks away from home. However, it appears doubtful that the push for EFT will come from individuals.

Since the commercial banks are the primary operators of the present payments system, their problems with the system are of high importance. The major satisfaction of the commercial banks with the present payments system is that it works reliably, is well understood, and well accepted. Their concern is the rapidly rising cost of operating the system, particularly in the check area. The banks see no end to the increase in check volume and fear a deterioration in the system's ability to handle the load. There are forces here that may make EFT a vital part of the payments system.

Business on the whole is satisfied with the current payments system but can recognize that noticeable reductions in cost are available through EFT. One of the major cost reductions to business would be the decrease in bad checks received by businesses. They would be willing to accept EFT if they could be shown that it would not drastically alter the customer/merchant relationship or that it would not make the credit card infeasible as a marketing tool.

These are the major forces affecting the inclusion of EFT as part of the payment system. The prime factor comes down to the fact of how the individual consumer will react to the introduction of EFTS. The consumer, if given credit for being intelligent, will be looking to receive the most service at the least cost both in money terms and in the form of personal inconvenience. Therefore, we will next look at the types of EFT services that a bank can offer to its customers.

FOOTNOTES

- ¹ United States Department of the Treasury, Monthly Statement of United States Currency and Coin, July 31, 1976.
- ² Federal Reserve Bulletin, September 1976, p. A12.
- ³ Flannery, Mark J. and Dwight M. Jaffe: The Economics of an Electronic Monetary Transfer System, pp. 36, 38.
- ⁴ Arthur D. Little, Inc.: The Consequences of Electronic Funds Transfer, National Science Foundation, June 1975, p. 58.

CHAPTER 3: CONSUMER-ORIENTED EFTS

This chapter will examine in detail the various alternatives from which a financial institution may choose the electronic funds transfer system (EFTS) services to offer to its consumers.

While EFTS is the general term used to describe any computerized system that affects an exchange of value or financial information between two or more parties, there are six readily identifiable subsets of EFTS that are currently in use. The six identifiable subsets are:

- 1) Automated Clearing House (ACH)
- 2) Fed Wire and Bank Wire System
- 3) On-Line Branch Banking Systems
- 4) Automated Teller Machines (ATM)
- 5) Pre-authorized Debit and Credit Systems
- 6) Point-of-Sale Systems (POS).

The first two subsets, the Automated Clearing Houses and the Fed Wire and the Bank Wire System, are methods used by the banks to accelerate and improve the accuracy of interbank funds transfers and are transparent to the consumer. Therefore, they will not be examined in this thesis.

The four consumer-oriented subsets will each be examined in depth. The examination will consist of a basic definition of the alternative, the benefits it will give to both the bank and the consumer, the disadvantages from both viewpoints and the citation of currently operating

systems of that form.

On-Line Branch Banking Systems

An on-line branch banking system is basically a computerized system that allows real-time access to the customer's account balances from all the branches of a bank. The data entry point is a terminal located at a normal teller station and manned by a live teller. The customer has no direct contact with the terminal. As the teller processes the customer's transaction, all required changes to the account balance and any necessary validation of the presence of sufficient funds are carried out by the computer. Some on-line branch banking systems have only the customer's demand deposit account (checking account) on-line; others have ordinary time deposit accounts (savings accounts) on-line as well as the demand deposit account; a very few include special time deposit accounts such as Christmas Club accounts. The systems with multiple accounts on-line usually allow a single transaction to transfer funds from a customer's account from one type to another of the customer's accounts. The ease of transfer of funds from one account to another leads to a blurring of the distinctions between account types and has led to a phenomenon that is called one-account banking. One-account banking would combine a customer's checking and savings accounts into a single account that would draw interest on some figure below the minimum monthly account balance. Another advance that can be part of the on-line branch banking system is the digitalization of account signatures so that the signatures

on paid items could be checked at any branch. This would remove much of the risk from the payment of third-party items drawn on the account of one of a bank's customers and paid to the payee at a teller station.

The major benefit of an on-line branch banking system for the financial institution is in the increased operational facility it provides. The teller is able to handle more transactions because the automated system makes the required account validations quicker than a manual system. Also, with all transactions processed on a real-time basis, the time that the tellers require to complete the closing out of their window at the end of the day is greatly reduced. Another benefit would be the elimination of the possibility of having a non-sufficient funds paid them. The major benefit for the consumer is the reduction in the time required to perform your banking transactions.

The major disadvantage of an on-line branch banking system is that it does little to achieve one of the major goals of EFTS, that of paper truncation. Also, with the high equipment requirements of multiple terminals per branch, the required communication equipment and the need for dedicated central processor time, the continuing cost of the system is very high and there are substantial original setup costs involved in programming the system and converting the customer accounts to the new system. A disadvantage for the consumer is that since the system involves a teller-operated terminal, the system is only available during hours when the branch is normally open.

On-line branch banking systems have been in use for many years by

savings and loan associations since they were only allowed to have time deposit accounts until recent legislation started to give the ability to offer demand deposit accounts. An on-line branch banking system is much easier to design and implement if only one account is involved. Many of the large commercial banks that operate a retail banking business in a highly competitive market are following this alternative in their EFTS efforts. The reason for this preference is that an on-line branch banking system has internal efficiency benefits that are attainable without having to deal with the external competitive forces. An example of this approach is Bankers Trust Company of New York whose Retail Banking Business System is built around an on-line branch banking system. Bankers Trust's system is scheduled to be fully operational in early 1978.

Currently operational is the Cape Cod Bank & Trust Company's teller inquiry terminal system. The system has thirteen branches on-line and seventy-two teller terminals installed. The system was designed by the bank and Datatrol, Inc. and is run on a NCR Centry 201 computer. After eighteen months of operations, James H. Rice, the bank's president, said, "... the system has shown it to be not only cost justifiable, but an installation that will satisfy many of the future communication and operational needs of the bank."¹

Automated Teller Machines

An automated teller machine (ATM) is a device capable of processing a variety of routine financial transactions between a depository insti-

tution and its customers without any human activity other than that of the customer. The functions of an ATM might include accepting deposits, providing withdrawals, transferring funds between accounts and accepting instructions to pay third parties. The concept of ATMs is viable in either an on-line environment where there is real-time account balance adjustment or in a remote mode where there is a tape internal to the ATM that is updated daily or weekly and limits the withdrawals that can be debited on any given account. While an ATM in an on-line mode allows the bank more control over a customer's withdrawals and allows the customer access to his entire balance, there is the additional cost of maintaining a communication link to the bank's computer; on the other hand, an off-line ATM, while avoiding any communication costs, has the disadvantages that the customer is limited as to the amount he can withdraw between updates and the bank faces the risk of a customer withdrawing the maximum allowed from several different ATMs and overdrawing his account. ATMs can be located either on or off bank premises. Placement at off-premises locations or in special on-premises lobbies allow the customer to have access to his account during nonbanking hours. ATMs are also called Remote Service Units (RSU) and Customer/Bank Communication Terminals (CBCT). One of the problems facing the widespread usage of ATMs is the legal question of whether or not an off-premises ATM constitutes a branch. The answer to this question is of particular importance in states that have a unit-banking rule which prohibits more than one branch. The legal decisions on this matter have not been consistent to this point in time.

Some states have decided that an off-premises ATM constitutes a branch while other states have found that since an ATM cannot provide all the services of a manned branch, it is not a branch. The final decision in this matter will decide the role that ATMs play in the future of EFTS.

At this point in time ATMs are the most widely used form of consumer-oriented EFTS with over five thousand terminals in operation and new ATMs being installed at a rate of over 100 per month. At present the installed ATMs process an average of 1,796 transactions a month.²

The financial advantages of ATMs to the financial institution are very great. The major benefit is the reduced need for large investments in new branch bank buildings. Other benefits are the lowered teller and officer costs. The disadvantages to the bank are that consumers have shown a preference for a human teller, the loss of personal contact with the customer may lead to a decrease in the sale of special services, the possible adverse customer reaction to machines that might be out of service or out of cash and the fact that the cost to install an ATM runs between twenty thousand and fifty thousand dollars. The reason for this high cost is that, in addition to the cost of the mechanical and electronic portions of the ATM, there is a need to build an ATM so that it will be a secure depository for the money it contains. A branch that is fully ATMs does not enable the bank to offer a full line of services. The current legal problems with ATMs is another disadvantage. The major benefit to the consumer is the availability of 24-hour-a-day, seven-day-a-week banking services. The disadvantages to the customer

are the loss of the social interaction with the teller (this is a very valid concern with respect to certain customer groups such as the elderly) and the fear that they may be robbed if they withdraw cash from an ATM in an isolated location.

An example of the use of ATMs in the Boston area is the Coolidge Bank's Cool Cash Machines. The innovative services that can be provided using ATMs is exemplified by the placement of an off-premises ATM in the Oakwood Apartments by Virginia National Bank. Oakwood Apartments is a three-thousand resident complex in Arlington, Virginia. The terminal allows the bank's customers to make deposits to or withdraw funds from individual or multiple accounts, move funds between accounts, pay bills and loan and obtain current account balances. These services are available twenty-four hours a day without the residents going any further than the complex clubhouse.³

Pre-authorized Debit and Credit Systems

Pre-authorized debit and credit systems are an EFTS service that allows the financial institution to make previously specified deposits to withdrawals from a customer's accounts without the customer being directly involved. The easiest form of this service is when the debit or credit is a fixed amount paid on a regular basis. An example is the direct deposit of payroll. The bank just performs the funds transfer in the set amount on the set date making the necessary adjustments in both accounts involved. There is no need for either party to get involved

the payee's pre-assigned code number, the amount of the transaction and any other information required to complete the transfer of funds. The computer completes the transaction when it has all the needed data.

There are three major benefits for the financial institution that offers pre-authorized debit and credit services. The first is a reduction in the operating expenses in the check processing and transit areas. This reduction is caused by paper truncation. The second benefit is the elimination of float from the transaction. The third benefit is the competitive advantage of offering a new and innovative service. The major disadvantage is the high development and promotional expense involved as well as the need to modify the existing paper processing system to handle a truncated paper flow. The benefits to the consumer are many: the convenience of paying bills from home; the convenience of having your paycheck deposited without having to go to the bank; the saving of check writing and mailing costs; and the security of knowing that checks cannot be stolen or misplaced. The elimination of float on these transactions is a two-edged sword for the consumer. He gains on credit transactions but loses on debit transactions. A primary disadvantage for the consumer is the loss of the cancelled checks as a proof of payment.

An example of an ATP system is the 'Pay-by-Phone' service offered by Telephone Computing Services, Inc. The service is currently in use by the Washington Mutual Savings Bank, the largest savings bank in the State of Washington (25,000 customers currently using the systems and 1,500 merchants, utilities, and national credit agencies assigned codes)

and by the Farmers and Mechanics Savings Bank in Minneapolis (14,000 active users). A consortium of forty Massachusetts savings and loan associations are committed to having a 'Pay-by-Phone' system operational by the first quarter of 1977.⁴

Point-of-Sale Systems

A Point-of-Sale system that is a true EFTS entails the placement of a communication and data capture terminal at the location where goods or services are paid for and the connection of the terminal to the financial institution's computer; this terminal is operated by the employees of the merchant on whose premises it is located, and when the sales transaction has been completed, enough information has been captured by the terminal and communicated to the computer so that the computer may effect a transfer of funds from the customer's account to the account of the merchant. The term POS has also been used to identify two other types of vendor located terminal systems that will not be considered by this paper as they are not really electronic funds transfer systems. The first is a system that exists in order to capture accounting records for the merchant, records such as sales, inventories, and accounts receivable. The system is not connected to a financial institution at all. The POS terminal system used by the McDonald's hamburger chain is an example of this type of POS system. The second type of non-EFTS POS system in operation is one that is connected to a financial institution but merely provides credit card authorization or checking account balance verifica-

tion. An example of this type of POS system is the credit card authorization/check verification that Citibank has in operation in New York City and surrounding areas.

The major benefits of a POS system to a financial institution is that it allows them to service their depositors at convenient locations at what is a low per location investment compared to an ATM. Also there is a large degree of paper truncation that results from a POS system. For the financial institution, there exist three prime drawbacks to a POS system. First, it decreases the amount of personal contact that the bank has with its customers. Second, in a POS system where one terminal at a merchant location can communicate with a number of banks, one bank cannot be distinguished from another leading to a loss of identification of a customer with one bank. Finally, the retail clerk operating the terminal, while not employed by the financial institution, acts as the bank's de facto representative to the customer. The benefits of a POS system to the consumer are that it allows him to save time by combining shopping and banking and that it reduces costs by eliminating the writing of checks and the mailing of bills. The major disadvantage of a POS system to the consumer is the loss of the two or three days of float that he would have been able to take advantage of if he was paying by check. The customer also loses the cancelled check as a proof of payment.

One of the first EFTS-oriented point-of-sale systems was the one tested by the Hempstead Bank of Long Island, New York starting in November 1971 with 32 merchant locations and 1200 system users. After

fourteen months of operation this test system was taken out of operation so that an extensive evaluation could be performed. This test system had been run in a very limited market involving customers at only one of the bank's branches. Hempstead Bank was granted a patent on its "System of Transferral of Funds" in December 1974 and in early 1975 went back on-line with an expanded system. The current system involves six branches, 43 merchants and 4500 customers. Probably the most famous EFTS POS system is the system installed in the Hinky-Dinky Supermarket chain by the First Federal Savings and Loan Association on Lincoln, Nebraska. The System went into operation in early 1974 and was closed down less than two months later by court injunction sought by several banks and savings institutions. After going back into operation in late summer of 1974, the legality of the service First Federal was offering was unanimously upheld by the Nebraska Supreme Court. Since that decision, First Federal has expanded its system so that it now offers a fairly state-wide service used by several banks.

Summary

These four alternatives are not intended to be a comprehensive cataloging of the available forms of EFTS. However, they do represent the forms that are most frequently being considered today. Working with these four consumer-oriented EFTS alternatives, we will now try to develop a methodology for the financial institution to choose which alternative to use as its entry into EFTS.

FOOTNOTES

- 1 "Terminals Keep Tellers Up-to-Date," Computerworld, July 26, 1976, p. 5/4.
- 2 Liebttag, Kathryn: "100 New Cash Machines, ATMs a Month;" American Banker, July 14, 1976, p. 1.
- 3 Wiseman, Toni: "Bank Hits Home for Apartment Dwellers with Automated Teller Unit in Lobby;" Computerworld, August 30, 1976, p. 25.
- 4 Hammond, Robert P.: "No Answer in Seattle, but EFT Service Stays on Line and Connects Other Markets;" Bank Systems & Equipment, June 1976, p. 77.

CHAPTER 4: FACTORS IN THE EFTS STRATEGY DECISION

Introduction

Our purpose in this chapter is to develop a methodology to aid the top management of a bank in the development of a good EFTS strategy. This strategy will have a time horizon of at least five years and is of course necessarily tied in with the larger overall strategy of the bank.

In Chapter 3 we divided consumer-oriented EFTS into four categories:

- 1) On-line accounts accessible at the branch level
- 2) Pre-authorized debit and credit systems
- 3) Automated Teller Machines (ATM)
- 4) Point-of-Sale (POS) equipment

It is our contention that the costs of getting into EFTS through any of these four categories can be readily obtained for a particular bank.¹ (It must be noted at this point that these costs will vary across banks and environments.) Rather, it is our goal to present a framework whereby a bank may determine what payoffs are associated with investing in a particular type of EFTS in a particular market. In a sense, the EFT decision is a capital investment decision where the different alternatives must be ranked and also compared with the alternative of doing nothing. This is not to imply that the four alternatives are mutually exclusive. It is conceivable that a bank might decide to implement all four of the EFTS mentioned in Chapter 3 or any combination of these.

Our approach is to examine six factors that we consider to be the most important in determining the EFT decision:

- 1) Type of bank
- 2) Check processing volumes and transaction profile
- 3) Number and concentration of branches
- 4) Technological constraints
- 5) Competitive forces
- 6) Regulatory and legal issues

In the remainder of this chapter we will discuss each of these factors and its importance in helping a bank formulate an EFTS strategy.

Type of Bank

The first factor under consideration concerns what type of bank the decision-maker is. The distinction between wholesale and retail banking is useful here although it is necessary to define these terms more precisely. The wholesale/retail distinction refers to the size distribution of both loans and deposits.

Wholesale/Retail

A wholesale bank will have a small number of large loan and deposit accounts; a retail bank will have a large number of smaller loan and deposit accounts. Retail banks will also tend to be more labor intensive in the sense that a larger number of employees is required to maintain the same level of loans and deposits. (An example of a wholesale bank is the Morgan Guaranty Trust which had \$1,387,188 of loans and \$2,032,796

of deposits per employee in 1975 while Bank of America, generally regarded as a retail bank, had \$529,217 of loans and \$868,516 of deposits per employee.) Of course, these are extreme points along the wholesale/retail continuum. The more important point is that a bank must determine where it lies along this continuum (and where it wants to lie) vis-à-vis its competition. This question may be attacked by searching the local industry data. A wholesale bank does not have a crucial EFT decision to make since the type of EFTS we are talking about is unlikely to affect the bulk of its business. On the other hand, a retail bank cannot afford to ignore the EFTS decision because it may find its customers being lured away by other banks offering more diverse and/or convenient services.² In addition to this, the increasing costs of check processing will continue to be a profit drain for many banks. An EFT system can help to curb these costs by providing the consumer with an alternate payment mechanism that is more convenient, and in some cases, less costly.

Personality

An aspect of the question of which type of bank is making the EFTS decision relates to the "personality" of the bank. How aggressive has it been in the past and how aggressive does it want to be in the future in the introduction of new banking services? One indicator of this aspect, although by no means the only one, would be the presence or absence of a credit card and/or a debit card. In particular, the card history can be a rich source of data to aid in determining how quick the bank's customers have been in adopting new services in the past and could

also aid in estimating the level of transactions that could be expected from a particular market if, say, a POS system were implemented. This could be accomplished by examining the number of transactions at particular merchant locations and determining if the volume is high enough to support EFT equipment.

Size

The size of the bank is also an important determinant. The investment required might be too large for a small bank to absorb and this might indicate that small banks ought to join with a larger bank and participate in that bank's EFT developments. Alternatively, consortiums of small banks could develop to share the costs of EFT development.³ It is interesting to note at this point, however, that the more innovative EFTS developed to date have been those developed by small banks.⁴ This phenomenon is due to the fact that several small banks have been willing to take risks and sacrifice short-run profits in their commitment to EFTS while their larger counterparts have waited to see in which way EFTS develops before committing themselves.

In summary, the first step to be taken is to determine which type of bank the decision-maker is. This entails a self-examination designed to force the bank to decide where it wants to be a few years hence. A reasonable outcome of this process might well be a determination to become more of a wholesale bank in order to avoid most of the thorny EFT issue if a bank is convinced that retail banking is destined to become less profitable as a result of EFTS.⁵ Another bank might decide that the EFT decision is crucial to its survival and will begin to take action.

Check Processing Volumes and Profile of Transactions Volumes

The second factor that must be analyzed concerns the volume of checks that are currently being processed by the bank. Check volume for the U.S. banking system as a whole has been growing at a rate of 7% per year for the last twenty years. The introduction of credit cards, which many bankers hoped would reduce check volume, has apparently not stemmed this growth, although it could well be that check volume would have grown faster in the absence of credit cards.⁶ The first step for the individual bank to take involves looking at the volume and the cost per check figures and extrapolating the trend for the next five years. Next, projected equipment and manpower requirements must be laid out. This will aid in determining how crucial it is for the bank to reduce paper flow since an EFT system could help in cutting these costs and thus increase profits. If the trend shows that the volume of checks and the cost of processing each check is slated to grow, then it is imperative for the bank to look into ways of reducing paper flow.

Profile of Transactions

The next step to be taken is to determine how the various forms of EFT will impinge on the volume of checks. In order to do this, it is necessary to develop a framework that enables the bank to determine who are its customers and which form of EFT is best suited for these customers. This involves subdividing the bank's customers into several groups and analyzing the number of transactions accounted for by the different groups. Table 1 shows a matrix developed by Arthur D. Little, Inc. in order to

determine the impact of EFT on the payment system. The figures are estimates for the banking system as a whole and will of course vary across banks. On the vertical axis, writers of checks are subdivided into individuals, business, and government. The horizontal axis refers to the receivers of checks and is similarly subdivided into these three groups. The matrix attempts to match writers and receivers of checks by ascertaining the number of checks that flow between the various groups. For example, it may be seen from Table 1 that, for the nation as a whole, 46% of all checks are written by individuals to businesses. The relevance of this matrix to our analysis hinges on the fact that concentration of volumes on several cells of the matrix may point to a particular type of EFTS. For this reason, we believe it important for a bank to analyze its customer's use patterns and derive this matrix.

Table 1
Overall Use Patterns of Checks

		<u>Receivers</u>			Totals
		Individuals	Business	Government	
<u>Writers</u>	Individuals	3%	46%	1%	50%
	Business	26%	16%	1%	43%
	Government	<u>5%</u>	<u>1%</u>	<u>1%</u>	<u>7%</u>
	Totals	34%	63%	3%	100%

Source: The Consequences of Electronic Funds Transfer, Arthur D. Little, Inc.

Individual-to-Individual

A significant amount of volume in the Individual-to-Individual cell would indicate that a pre-authorized debit/credit system or a POS system would be difficult to introduce among the bank's present customers since most of the volume could not be impacted with either of these systems. Since these transactions are accounted for by checks made out to cash and to other individuals, on-line branch banking and/or ATMs could impact on this volume. With on-line branch banking, the process of cashing a check, particularly an out-of-branch check, might be speeded up. An ATM might accomplish a volume reduction by dispensing cash during non-banking hours. The determination of check cashing volume is a relatively simple task since, as mentioned in Chapter 2, these checks are usually separated from other checks for later processing.

Individual-to-Business

A high number of transactions in the Individual-to-Business cell would indicate a potential market for a pre-authorization system or a POS system since these two systems would facilitate exchanges of value between these two groups by eliminating most of the paper involved in a transaction. The transfer of funds could be initiated by the customer's instructions in a pre-authorization system or it could be activated by a plastic card in a POS system. Table 2 was also developed by Arthur D. Little, Inc., and it breaks down the individual uses of checks into several payee categories. A more meaningful exercise for a particular bank would be to break down the use pattern to the level of individual businesses in the

bank's market. This could aid in determining the volumes related with both a pre-authorization system and a POS system. For both these systems profitability hinges on sufficient volume. For example, a bank might discover that 15% of its total check volume is accounted for by payments to the local utilities, a few department stores and the credit card companies. A pre-authorization system that allows the customer to make these payments by telephone could prove successful if customers were induced to switch over from writing checks.

The viability of a POS system could be determined by combining the check data with debit/credit card data in order to ascertain who the large retail merchants are. As mentioned earlier, this data could aid in determining which locations have enough volume to support the costs of a POS system. A bank might also survey the number of retail transactions, including cash and credit card transactions, in a given market in order to determine the feasibility of a POS system.⁷ Arthur D. Little, Inc. produced this type of analysis for the country as a whole which is shown in Table 3. This table attempts to break down transactions by size for the different payment media. Both unit volume and dollar volume are shown. The important things to look at in an individual analysis would be a high number of transactions in the greater-than \$1 range and a concentration of retail establishments that account for a large number of these. Transactions of less than \$1 are not judged to be important since the cost of the payment mechanism relative to the size of the transaction is too high. The issue of retail establishments is important in order to

determine the location of terminals.

Table 2
Individual Use Pattern of Checks

<u>Payee Category</u>	<u>Percentage</u>
Food Stores	9
Retail Shops	15
Retail Gasoline	4
Other Businesses	16
Utilities	9
Insurance	4
Medical	4
Commercial Banks and Cash	11
Other Financial Institutions	5
Non-Profit Institutions	5
Government	5
Individuals and Unidentifiables	<u>13</u>
	100

Table 3
 Current System Transactions and Transaction Values
 (Annual Basis--Mid-1970's)

	Total Transactions (billions)		Size of Transaction						Total Transactions		
	#	%	less than \$1	\$1 - \$10	more than \$10	Quantity (billions)	%	Quantity (billions)	%	\$ (billions)	%
Cash	216	87%	162	43	11	196	75%	20%	5%	196	3%
Checks	28	11%	-	3	25	7000	-	10%	90%	7000	96%
Credit Cards	5	2%	-	2	3	55	-	40%	60%	55	1%
Total	249	100%	162	48	39	7251	x	x	x	7251	x

Individual-to-Government, Business-to-Individual, Government-to-Individual

High volumes in three other cells of the matrix, the Individual-to-Government, the Business-to-Individual, and the Government-to-Individual clearly point to some types of pre-authorization system that will facilitate these transfers. In a pre-authorized debit system, there is a large number of customer payments to a small number of firms. In a pre-authorized credit system there is a small number of firms making payments to a large number of people. The crucial point here is that there must be a concentration of either payors or payees in order for the system to be cost-justified. For example, if a pre-authorized debit system were implemented in a situation where there is a large number of firms receiving payments, the cost per transaction would be higher than in the case where there is a small number of firms.

Other

The other four cells of the matrix were to be non-applicable to consumer-oriented EFTS. Table 4 summarizes in tabular form the importance of volume concentrations in each of the various cells of the matrix presented in Table 3.

TABLE 4

Receivers

		Individuals	Business	Government
<u>Writers</u>	Individuals	1) On-line branch banking 2) ATM depending on cash analysis	1) Pre-authorized debit system 2) POS	1) Pre-authorized debit system
	Business	1) Pre-authorized credit system (e.g., direct deposit of payroll)		
	Government	1) Pre-authorized credit (e.g., direct deposit of payroll, social security, welfare)		

Number and Concentrations of Branches

This factor is likely to impact on the viability of an on-line branch banking system and on ATMs. The greater the concentration of branches the greater the likelihood that out-of-branch checks need to be cashed. This becomes a problem if the bank has a large number of accounts. In this situation each branch will usually not have access to the balances and the signature cards of all the bank's accounts. Thus, checks from other branches cannot be cashed without assuming risk or calling the central office in order to obtain the balance. In some banks, this function takes up over 50% of the platform officer's time. The time of the person at the other end of the line who is doing the checking could also be saved. In the case of ATMs, their installation could be justified on the basis of the number of transactions that may now be performed by the machine.

The crucial point to examine in the area of branches is the level of activity. If there is a long transaction time at the branch, both systems can improve this; the on-line branch banking system by improving teller productivity and ATMs by allowing the customer to perform some banking functions without requiring a teller and during non-banking hours. Another question that must be answered in the case of ATMs is whether they are legally regarded as branches. In jurisdictions where they are not, an ATM could be located off-premises and thereby serve a greater number of people.

Technological Constraints

Another factor that a bank must examine while developing an EFT strategy is the technological constraints that it faces. The technological constraints to EFT exist in three primary areas: the computer industry's state-of-the-art, the bank's location, and the bank's own state-of-the-art. The existence of constraints in these areas affect the bank's choice both as to what form of EFT services to offer and as to whether or not any move can or should be made into EFT.

Industry's State-of-the-Art

The technological constraints in the area of the computer industry's state-of-the-art are those of forcing the bank to know what its needs are and what they will be and taking only that degree of technology. Techniques such as digital signature verification,⁸ voice recognition devices,⁹ and intelligent teller terminals are all part of the computer industry's array of potential EFT offerings. As in any decision of this type, reliability and sophistication must be balanced. The second problem that the banker should be aware of is that the computer industry's state-of-the-art has been improving continually since the 1950s and with this improvement comes new technology that allows both old services to be offered at a lower cost and totally new services as well. This trend is readily visible in developments such as the minicomputer and the use of microprocessors in many everyday devices such as stoves and sewing machines. The opportunity cost of not adopting new technologies must be weighed against the expectation that less costly and more versatile

hardware/software may be available in the near future.

In summary, the technological constraints in this area come down to two issues: first, the bank must find out what EFT services it wants to offer and what computer technology is required for these services; secondly, will there be better technology in the short-run future so that development should be delayed until the new technology can be evaluated.

Bank's Location

Technological constraints imposed by a bank's location tend to be concentrated in the communications realm. All four forms of consumer-oriented EFT involve the communication of information from a data entry device to the main computer. If the communication link is unreliable or very expensive per transaction, the feasibility of EFT is drastically reduced. In the case of an on-line branch banking the branches have to be connected to the central computer. The concentration of branches is an important factor here since a high geographical dispersion could mean high communication costs. Both ATMs and POS systems can be run using automatic dial-up devices on regular phone lines since there is no constant usage of the device. The problems of quality of phone lines and the reliability of service become important in these two types of EFT systems. An ATM may be run in stand-alone mode if communications were a problem. In automated telephone payment systems the communications link is originated by the consumer and is open to the same problems as the ATM and POS systems. If telephone payment systems were implemented using

human operators, the communication problem is not too serious. If, however, the system were to be fully automated, then Touch-Tone phone service must be available. The use of a Touch-Tone phone lowers the cost of the transaction to the bank since the customer can communicate directly with the computer without requiring a teller-operator.

Bank's State of-the-Art

The major technological constraint to EFT development is the state-of-the-art of the bank's data processing capabilities. The degree of data processing expertise exhibited by banks runs the gamut from banks that do little or no internal computing to banks that make use of highly advanced computer techniques. Even for a bank that is advanced in its use of the computer, the introduction of an EFT system on any large scale will require major changes in its information systems. For a bank that is currently not making efficient use of the computer, embarking on an ambitious EFT project such as a POS system would be a very risky venture. Instead, such banks might make their entry into EFTS via preauthorization systems or stand-alone ATMs.

There are three information system techniques that we consider to be good indicators of a bank's data processing state-of-the-art. The first is the use of on-line systems for accessing information. An on-line system requires different responses and expertise from the computer group than a batch system. The second technique is the assignment of a master account number to each customer and the identification of different types of accounts and loans by means of a sub-account number code (e.g., xxxx01

is a demand account, xxxxxx21 is a time account, and xxxxxx is a customer's master account). This is basically one-account banking as discussed in Chapter 3.¹⁰ The third technique is the existence of a customer information file that contains all relevant information on a customer and is in a computer readable form. All banks maintain this sort of information on their customers but only in a very few cases is there a unified file and in even fewer cases yet is this file computerized. The further along the road that a bank is in the use of these techniques, the smoother the transition to EFTS.

Competitive Forces

Retail banking has always been a low profit margin business and under various changing conditions has yielded even lower profits in recent years. The competitive nature of the retail banking business has made banks offer services that are not as profitable as the bank would like but which they must offer to remain competitive in their marketplace. An example of this may be seen in the trend towards so-called 'free-checking'; from the bank's viewpoint, checking is anything but free. This increased competitiveness magnifies the importance of operating efficiency. Without the revenue from service charges on demand deposit accounts, the bank with the most efficient "back office operation" is the one that has the lowest cost of funds.

One competitive factor a bank should evaluate is its market share. [Within the bank's market area, how many of the total number of possible account holders have their accounts with your bank?] The answer to this question is of particular importance when a bank is considering a POS system. The system will not be cost justifiable unless the volume of usage is high.¹¹ Of course, the volume of transactions may override the market share issue (e.g., 10% of the New York City market is much larger than 80% of the Smalltown, U.S.A. market). Nevertheless, market share is important if enough merchants are to be induced to join the system.

Retail banking is a highly service-oriented business. Therefore, an important competitive factor for a bank entering the EFT service arena to consider is what their competitors are offering to the public in the form of EFT services. Certain EFT services are more highly visible to the consumer than others. If a bank makes its entry into EFT through an on-line branch banking system where the major benefits are to the bank and one of its competitors is offering a series of ATMs that give its customer access to their accounts around the clock and a second competitor has an automated telephone payment system that allows its customers to pay bills by phone from their home or office, the first bank is bound to lose customers to the other two banks since the other two are offering services that are more easily perceived by the consumer as giving him a tangible advantage. Even if the consumer does not terminate his banking relationship with his current bank but instead opens a second account at a new bank in order to make use of their EFT services, the primary bank still

loses the use of the funds that are deposited in the second account. POS systems are the most visible of the EFT alternatives discussed in Chapter 3. A bank offering such a system will need to develop marketing clout if it is to be successful.

Since market share and the actions of competitors have such a strong effect on which EFT alternative a bank should offer, there are significant forces at work in the marketplace to form consortiums to provide EFT services. In this way, smaller banks and those who were late to enter the EFTS arena can compete with larger banks and EFTS pioneers. Examples of consortiums of this type are the joining of forty banks in Massachusetts to offer a pay-by-phone system and the attempts of Hempstead Bank on Long Island to put together a consortium of banks so that it can offer its POS system county-wide.

Regulatory and Legal Issues

The final factor that we will consider in detail will be the question of what regulatory and legal issues impinge on a bank's development of an EFT strategy. All major forms of depository institutions are regulated by either state or federal agencies. Also all depository institutions act as the agent of the depositor in the processing of financial obligations and owe their depositors a fiduciary duty to exercise due care in protecting the customer's deposits. So in any entry into EFTS, the bank must be careful to fulfill its legal responsibilities to its depositors while acting within the regulations that it must obey.

Branch Issue

One of the major legal questions facing EFT is the problem of whether or not an ATM or a POS terminal is to be considered a branch. If it is a branch, then the bank must follow the applicable branching statutes in the placement of these EFT devices. This is of particular importance in states that have a unit banking law. A case in point is the United States Supreme Court's decision that Continental Illinois' CBCTs constitute branches and are thereby illegal under the Illinois unit banking law.¹² This point is crucial for a bank with few branches wishing to enter a new marketplace. ATMs may provide a low-cost way of getting a toehold in such a market without the added costs of bricks-and-mortar and personnel.

Patent

A second legal point is the existence of a patent covering a system of transferral of funds which is held by Hempstead Bank. The patent describes a fairly general point-of-sale system. Although the patent has not been tested in court yet, it is a factor that should be considered before setting up a POS system.

Privacy

Not enough can be written on the issue of privacy in the EFTS area. The fact that payment information will be centrally located and easier to access than under the present check system is an important consideration. In addition, it will be easier to determine which businesses a particular

individual deals with and to construct a "fiscal profile" of that individual. Is this information the property of the bank or the customer? What are the legal requirements on the amount of physical security that the bank must supply for this information? Should outside businesses or the local, state, or federal government be allowed access to these records? These questions will have to be answered by the courts.

Some of the answers to the legal and regulatory problems confronting the growth of EFTS may be decided by the Congress after it receives the report of the National Commission on Electronic Funds Transfer in the Fall of 1977. This Federal Commission is charged with making policy recommendations as to the future of EFT.

Summary

We believe that any bank facing the EFT decision could adapt our framework when formulating its EFT strategy. We have attempted to summarize this framework in Table 5. On the vertical axis are the four EFT alternatives discussed throughout this chapter. On the horizontal axis are the six factors discussed above. The table attempts to show the degree of importance of each factor when it is associated with a particular EFT alternative.

TABLE 5

Type of Bank	Volume and Profile of Transactions	Number and Concentration of Branches	Technological Constraints	Competitive Pressures	Legal and Regulatory Issues
1) Retail bank	1) Might impact Ind trans- actions 2) Could reduce traffic in branches	1) Importance in estimating hardware and communication costs 2) This factor could aid in determining desirability of OBB	1) Communications availability 2) Bank's experience with on-line	Of little importance	1) Error correction
1) Retail bank	1) See Table 4 2) Concentration of payors and/or payees important	Of little importance	1) Very little except in case of a Touch-tone activated telephone banking system	Of little importance	1) Error correction

On-Line Branch Banking

Pre-Authorized Debit and Credit System

(continued)

TABLE 5
(continued)

Type of Bank	Volume and Profile of Transactions	Number and Concentration Branches	Technological Constraints	Competitive Pressures	Legal and Regulatory Issues
<p>1) Retail bank</p> <p>2) Size of bank could lead to consortiums</p> <p>3) Customer acceptance of innovation</p>	<p>1) See Table 4</p> <p>2) Analyze cash transactions to determine volume & amounts susceptible</p> <p>3) Size of card base</p> <p>4) Economic justification</p>	<p>1) Extension of banking hours</p> <p>2) If considered branch, limited by number of branches</p>	<p>1) If on-line ATM:</p> <p>a) communications state-of-the-art in DP</p> <p>2) If off-line, of little importance</p>	<p>1) May provide low-cost entry into a new market</p> <p>2) Being other than first could imply public has been somewhat educated</p>	<p>1) Considered branch?</p> <p>2) Rules on consortiums (if any)</p> <p>3) Error correction</p>
<p>1) Retail bank</p> <p>2) Size of bank could lead to consortiums</p> <p>3) Customer acceptance of innovations</p>	<p>1) Analysis of market to determine level of transactions and market share</p> <p>2) Use of credit/debit card data base</p>	<p>1) Could the system to on-line branches</p>	<p>1) Communications availability</p> <p>2) Bank's DP state-of-the-art extremely important</p>	<p>1) Increased visibility</p> <p>2) May get significant % of new accounts (both individuals & merchants)</p>	<p>1) Patent issue</p> <p>2) Considered branch?</p> <p>3) Confidentiality of information</p> <p>4) Rules on consortiums</p>

Automatic Teller Machines (ATM)

Point-Of-Sale (POS) Equipment

FOOTNOTES

- ¹ See for example: Giese, Paul E.: "How to Figure the Cost of Getting into EFT," Banking, November 1975, pp. 102-133 and Bennett, Rex O.: "Economic Justification -- A Look at ATMs," Banker's Magazine, Spring 1976, p. 47.
- ² See "ABA Head Calls EFT Inescapable Reality for Banks," Computerworld, July 12, 1976, p. 10.
- ³ Fisher, John F. and Paul S. Nadler: "One Bank's Experience," Banker's Magazine, Spring 1976, p. 42.
- ⁴ See Smith, James E. and Robert R. Dince: "Consider the Banking Customer," Banker's Magazine, Spring 1976, p. 61.
- ⁵ See "Retail Banking Loses its Great Allure," Business Week, June 28, 1976, p. 45.
- ⁶ See The Consequences of Electronic Funds Transfer prepared for the National Science Foundation by Arthur D. Little, Inc. under Contract NSF-C844, June 1975, p. 258.
- ⁷ This factor was cited by John Kingston of the Hempstead Bank as one of the most important in determining the viability of a POS system and it is the heart of a computer model used by them to predict profitability for prospective licensees of their POS system.
- ⁸ See Jones, Stacy U.: "Signature Verification by Computer," The New York Times, October 1, 1976.
- ⁹ See Yasaki, Edward K: "Voice Recognition Comes of Age," Datamation, August 1976, p. 65.
- ¹⁰ See Mason, John M. and Kenneth L. Kramer: "One-Account Banking," Banker's Magazine, Spring 1976, p. 53.
- ¹¹ According to John Kingston of the Hempstead Bank, a good rule of thumb seems to be that a fifty percent market share in a particular market is required in order for a POS system to break even.

- 12 See Wiseman, Toni: "High Court Ruling Stymies EFT Operations of Banks," Computerworld, October 18, 1976, p. 2.

CHAPTER 5: CONCLUSIONS

It is our feeling that the consumer-oriented electronic funds transfer system decision is unavoidable for any depository institution that intends to operate a retail banking business into the 1980s. There are two reasons for this. First, retail banking is a very competitive, service-based business and you must remain competitive in terms of the services you are offering to the consumer. Second, retail banking, due to its competitiveness, has traditionally had a very low operating margin and with the rapid growth in the usage of checks and the staggering costs of processing those checks, EFT will be necessary in order to remain profitable as a retail banker.

Since there is a need to go to EFT, we feel that the discussions the EFT alternatives and decision factors earlier in the thesis will be of use to a bank in focusing their decision.

The EFT decision process should start with a meeting of the banks' top management in order to decide if the bank has a future in retail banking. If a decision is made to remain in the retail banking, then a task force should be formed to study the factors that effect the decision as to which form or forms of EFTS should be installed.

Of the factors, there are two that are of greater importance to the workings of the EFT task force. The first is the question of the bank's check processing volume and transaction profile. The analysis of this factor gives the strongest indication as to which of the alternatives

offers the bank the greatest degree of paper reduction.

The most important factor, one which is important regardless of which alternative is chosen, is the bank's degree of EDP expertise. All four alternatives require the use of on-line account balances. The development of the needed EDP expertise is not something that can be accomplished overnight.

Overall, the EFT decision is not an easy one to make but one that is necessary to make. The development and implementation of an EFT strategy is both time-consuming and expensive but ultimately will allow the bank to compete profitably in the retail banking world of the 1980s and later.

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