

NEWS RELEASE



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BANKING AND AUTOMATION

An Address By

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BANKING AND AUTOMATION

Some 150 years ago a half-witted lad by the name of Ned Ludd immortalized himself by destroying stocking frames. Those frames offered a new and efficient way of making stockings, and at the same time symbolized the dark forces responsible for the distress then prevailing in much of England. The inevitable march of the industrial revolution had overturned the handcraft economy, depriving frustrated Englishmen of their means of livelihood. The new machine methods were demons whose destruction seemed to offer the only hope for deliverance.

Today we are in the middle of another revolution no less significant in its implications for our production processes. Yet how different our attitude toward it! Assuredly it is bringing problems, but we have renounced a Luddite solution. Instead, the computer revolution is generally heralded as the source of more leisure and material goods in ever increasing variety and abundance, and welcomed as our savior from a threatening avalanche of paper. As its electronic methods are now adapted to commercial transactions, banks find themselves in the forefront of creative applications with complex consequences.

Growth in banking in the last few years has placed a heavy burden upon banking methods and equipment. Until the installation of the first electronic equipment about a decade ago, machines used in banks bore a definite family resemblance to those of pre-World War I vintage -- and some still do. Despite large additions to their staffs, banks were barely able to keep up with the

mounting volume of paper. Meanwhile, there was no abatement of pressures arising from their strategic role in supporting a viable and growing economy.

Banks have continued to strengthen their position as the principal dispensers of credit. Total bank loans have almost doubled in the last seven years. Time deposits at commercial banks have doubled in the last five years. The less rapid increase in demand deposits, which comprise our principal means for settling accounts, has been compensated substantially by their more intensive use. In a recent month, debits to demand accounts totaled almost \$5 trillion. The number of checks written has doubled in the last 12 years; the 15 billion written in 1964, taped end to end, would reach four times to the moon and back. Developments within the banking industry itself have accentuated the pressures, as banking has extended the scope of its services and gone into activities which require even more processing of paper.

These pressures and their intrinsic record-keeping demands have caused many banks to turn to electronic computers. About half of all banks with deposits over \$25 million are using, or plan to use, such automated equipment. Nearly all of the largest banks have such installations. A few of the smaller banks also have their own computers, but most small banks involved in using such equipment do so through their correspondents or through commercial or cooperative data processing centers.

The need to deal with the flood of checks which threatened to engulf banks was doubtless the single factor most responsible for the impetus to bank automation. The conjunction of two elements -- the electronic computer

and magnetic ink character recognition (MICR) -- provided the necessary technical tools. Banks were not long in discovering, however, that computer equipment had other applications. Indeed, the high cost of the glamorous new computers made it incumbent upon banks to discover and develop other uses. Operations which are recurring in nature have naturally been the first ones to be automated. Making up payrolls, accounting for instalment and mortgage loans, and maintaining records of deposit accounts are common applications.

For all its phenomenal feats, and not withstanding its accuracy and rapidity, an electronic computer can do only what it has been instructed or programmed to do. This must be done in precise detail and neatly sequenced steps. All it can do is count and compare, but that's enough, for solution of the most complicated mathematical problems can be reduced to the grammar school essentials of addition and subtraction.

The drastic changes in record-keeping brought by the computer have compelled bank management to re-think and revise their internal operating procedures. It should be emphasized, however, that the basic principles underlying a sound system of audits and controls are the same, whether the accounting system uses hand posted records, punched cards, or magnetic tapes. Instead of turning their work over to the machine, and in effect abdicating their responsibility, auditors need to participate in planning for automation from the very start. The built-in safeguards of computer systems and their amenability to arithmetic checks and programmed controls predispose them to audit techniques.

By freeing audit procedures from much laborious and repetitive manual effort, computer systems permit an auditor to do a more thorough job. Many different categories of data, with totals, sub-totals, and cross classifications are easily obtained. The ready duplication of records facilitates their use and comparison. Monitoring of input, a key step in the successful performance of a computer system, can be readily accomplished through proper instruction by the programmer. Though the speed of computers ordinarily reduces the need to resort to sampling, random sampling techniques may be used conveniently. The ability of the computer to assemble lists of special transactions during normal processing permits greater use of auditing by exception, a concept that commends itself increasingly to auditors and examiners alike.

But these opportunities for more effective internal controls over banking transactions come at a price, because the systems are vulnerable to accident and possible manipulation. Great care in programming is required in order to preserve enough of the record to permit its reconstruction. The ability to change or erase records without leaving a trace of evidence poses a constant threat. The fact that processing of records is often done off the premises further complicates the maintenance of control over them. Only as management itself becomes knowledgeable about computer procedures, and less prone to surrender its responsibility to the technicians, can it confidently make optimum use of them.

Valuable as it is in processing and maintaining records, the computer will never approach its full potential until it becomes an integral part of

the decision-making process. Many observers have pointed out that the handling of large-scale, routine, record-keeping functions utilizes an important but relatively minor part of a computer's capacity. Its strongest characteristic -- its speed and logic -- remains to be fully exploited. In an industry which has historically placed a heavy premium upon personal judgment, and emphasized the uniqueness of each situation, the reluctance to listen to the counsel of a monster which can do nothing more than count and compare characters or numbers is perhaps understandable.

I feel, however, that in many instances this reluctance has been based on a confusion. The fact, for example, that each loan or investment situation is unique does not preclude the possibility that a common yardstick is being used or could be used to measure each situation. In such instances the decision-making process can be programmed into a computer and it can incorporate a far more complicated system of measures than might have been utilized by off-computer decisions.

It is interesting to note that in a private survey of a large corporation, each echelon was asked to point out opportunities for automation. It was no accident, of course, that, almost without exception, each echelon found numerous possibilities for automation by subordinate echelons -- including those involving decision-making -- and little or no possibilities for its use in its own or higher levels of management. This will undoubtedly continue to be the response until, at each level of management, the largely unfounded fear of being displaced by automation is supplanted by the knowledge that automation can greatly improve those decisions that management will

always have to make.

Yet there are hints of a new attitude in the types of reports now being requested by management. The earlier devotion to turning out reams of statistics is being superseded by a concept of the computer as a storehouse of constantly available -- and changing -- information ready to be tapped as needed. Its availability to answer queries as to the current status of customers' accounts is inherent in the processing of transactions as they occur, intimated in such technical terms as "on line" and "instant retrieval." Some banks have set up departments charged with undertaking long-term programs of cost reduction and profit improvement. Computers make feasible to a degree never before attained the processing of all data bearing upon a given situation with a view to discovering the variables most responsible for a given condition. This information should greatly improve the ability of management to make prudent decisions.

There are numerous areas in which pin-pointed research should improve the operations of individual banks. Among those identified by various students of the matter are: the saturation or the potential of given markets; the locating of branches; allocation of overhead; forecast of loan demand; evaluation of loan applications; management of security portfolios; determination of liquidity needs; the relative economies of leasing or buying equipment or building; the scheduling of tellers; the routing of messengers; and simulation of the impact from introducing new ideas or procedures. These are merely examples -- if leading ones -- of areas which computers can illuminate more brightly than before, and provide management with hard-nosed reasons for doing or not doing specific things.

Implementation of new automated procedures is certain to change the internal organization, even the physical appearance of banks. As data processing moves from a satellite to a center position, growing in importance and prestige, shuffles will undoubtedly occur in traditional departmental lines. The trend toward centralized accounting, particularly of branch systems, obviously will be accelerated. Banking should become more of an around-the-clock operation, bringing an increase in shift work; for electronic equipment is too expensive to lay idle two-thirds of the time. Computers may well bring reductions in employment of persons engaged in routine clerical activity, and it will be necessary to follow sound policy in alleviating the attendant hardship as it occurs; but the general result should be an upgrading of work and emancipation from dull routines. Space requirements should be reduced as computers banish bulky files and batteries of bookkeeping machines. More than likely any released space will be needed to improve customer facilities as banks expand into new areas of service to their customers.

The impact of these developments upon bank supervision, as upon the banking industry, promises to be substantial. But this is no time to be timid or unimaginative. To cope with the great changes in banking already wrought or promised by the computer revolution will require new supervisory techniques.

In view of the variety of computer systems, and the demands which this places upon supervisory agencies attempting to become familiar with their individual idiosyncracies, the question is sometimes raised: Why shouldn't

there be more standardization? Tempting as standardization would be in the interest of simplifying a complex situation, it would be neither an easy nor a correct answer. The pressures to adopt one system rather than another would make a standardizing decision difficult. But more than that, the rapid improvements occurring in computer hardware and its capabilities would be stifled if development were frozen at a premature stage.

The hands-off policy with reference to standardizing computer systems is but an extension of the general supervisory policy toward bank records. The Federal Deposit Insurance Act contains no specific requirements concerning bank records and systems. The different record-keeping systems which have developed, under the expert scrutiny of bankers, accountants, and supervisory authorities, have been accepted as viable models. The Corporation's supervisory concern has been primarily in the direction of assuring the integrity of each system within its chosen framework. Accordingly, the Federal Deposit Insurance Corporation examinations have been concerned with the audit aspects of automated systems; that is, with the nature and control of input, processing, and output.

Among the techniques used by Federal Deposit Insurance Corporation examiners is a standard form questionnaire designed to develop information about automated systems. This questionnaire seeks affirmative answers to such questions as: Are ample controls exercised over input, output, and processing? Are records adequate to permit reconstruction of the entire account or ledger? Are adequate audit trails established at key phases of operations? Are there back-up facilities in case of a breakdown in the system? Are there adequate

protective measures to assure the physical safety of vital records? Is the system too expensive for the bank's present or foreseeable needs? Is it being used to full advantage? Does management place such excessive reliance upon the system that it neglects its duty to see that the bank is operated in a sound manner? The answers to such questions, supplemented by discussions with key automated data processing, or ADP, personnel, plus trained observation, permit a reasonably informed appraisal of the system.

Examination of banks with automated systems has been facilitated by the continuing contact we encourage with "our" banks; that is, insured banks not members of the Federal Reserve System. These banks have been encouraged to let our examiners know ahead of time of any intended move to ADP. When we learn of such a situation, one of our examiners meets with the management and ADP group. Together they mutually resolve foreseeable problems, particularly those relating to examination requirements.

These surveys, carried out independently of examinations, are not confined to new systems. We now plan, whenever feasible, to use the pre-examination survey technique, particularly in the case of the larger banks or of banks using commercial facilities to process data. Well in advance of the actual examination date, examiners will visit the bank or processing facility in order to become familiar with the system and map out the forthcoming examination. Control-point information can be established in advance, and the groundwork laid for obtaining data which will be required by the examination.

Once examiners are able to establish the reliability of automated records maintained by the bank, they will be able to spend more time on other

significant dimensions of a bank's performance. The fact that we are approaching this point is implicit in the substantial reduction in usual examining time that has occurred on some of our larger jobs.

Examination, of course, is only one of several supervisory tools. Through the insuring of banks, approval of branches, the requirement of regular reports and other actions the Corporation also seeks to assure the soundness of banks and the banking system. The factors bearing upon these actions and the information available from regular call reports are amenable to more intensive analysis than has been possible up to now. Plans for acquiring a computer system for use in the Corporation's Washington Office are going forward, and projects are being readied for the equipment.

Many of the types of research mentioned above as significant for individual banks have similar significance for the Corporation, but with this difference: The Corporation deals with data for all banks, or specific groups of banks, or with statistical aggregates which can be grouped in multiple ways. This type of processing readily permits the identification of items which deviate from pre-established norms; these can be printed out in separate reports for closer scrutiny. With potentials of this type at hand, we can look forward to a day when the computer will eliminate much of the routine field work done on examinations and enable justifiable implementation of the technique of supervision by exception.

In the supervisory agencies as in the banks, the proliferation of electronic computer systems has required the training of personnel able to deal effectively with them. Examination of the automated bank demands sets of skills not commonly found in nor readily extracted from examiners trained

in an earlier tradition. Accordingly, the Corporation has developed, in cooperation with the Federal Reserve System, regional training seminars to orient examiners toward the new techniques. It is also hoped that some standardization of supervisory approaches to automation may develop from this joint training.

Generalizations regarding our vast and diverse banking system are always hazardous and this no doubt is true in assessing the effects of automation. On the one hand there are the giant banks, with hundreds of branches, which have gone far in applying electronics. Then there are the small banks, in relatively isolated communities, with little more than a typewriter and a bookkeeping machine.

What kinds of banks do, in fact, mechanize their operations? The findings made about this matter some five years ago by one of the Federal Reserve Banks are probably still germane. Banks that emphasize retail banking with its branches, consumer credit, and special checking accounts were found to be more mechanized than those that don't. Lending banks were more mechanized than investing banks, reflecting the greater clerical work involved in investigating borrowers and servicing loans than in clipping coupons. Banks with a relatively high proportion of checking accounts were more automated than those with a high percentage of savings accounts. Mechanized banks have more employees and more branches. They have generally experienced the most rapid growth, and typically have more aggressive management.

On one significant point this particular Federal Reserve study sounded a disquieting note: it showed no correlation between mechanization and

profits, the factor ordinarily regarded as the prime motivating force in business activity. The higher earnings of mechanized banks were offset by higher expenses. Before too much significance is read into this, it should be noted that this finding occurred at an early stage of automation, which is usually expensive in itself, and before its long-run economies had had time to develop. Moreover, since profits are a distillation of everything a bank does, possible savings from mechanization may be drowned in expenses elsewhere. Nor can other motives to mechanization be ignored, such as saving space, better accounting control, greater accuracy, and better service to customers.

The most dynamic phase of a bank's operation today is the expansion of its service activities, and it is no accident that this has paralleled its application of electronic methods. In terms of today's banking operations, the increased overhead represented by computer systems puts a premium on volume, in order to reduce average unit costs. Since it is often difficult to obtain greater volume through regular services, there is a strong incentive to introduce new services; in other words, to innovate. This is precisely what many of the automated banks have done in providing new services to business. Prominent among these are the preparation of payrolls and handling of check reconciliation for customers. Other applications are constantly being devised, limited for the most part only by computer capacity and human ingenuity.

Most of these applications and others in prospective stages are reflections of acceleration in the evolution of commercial banking from the concept of

cash depositories and loan outlets to the futuristic institution of financial services. The computer, the tool which saved the industry from the paper flood, is now busily engaged in far-out studies which will lead to reversal and perhaps eventually to the virtual elimination of paper work in banking. Already we have had demonstrations of direct bill payment by telephone, and numerous related experiments are under way, many directed to the objective of greatly expanded services of all kinds, at electronic speeds, without the use of paper except as an after-the-fact summary of transactions.

The future is almost upon us -- perhaps too soon in terms of our social and educational dispositions to accept some of its concepts. Our technical accomplishments since World War II appear to have outstripped the capacity of many of us to keep up with them. It behooves us to accelerate the development of our own understanding of the computer revolution, lest the tomorrow of our institutions be left largely in the hands of the academicians and technicians without our having had a significant voice in its arrival.