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Elise G. Jancura

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# AUTOMATION AND THE BANKING INDUSTRY

*The author examines the effect of automation on the banking industry—with particularly interesting cases of successful and unsuccessful conversions to automated systems.*

Elise G. Jancura, CPA  
Cleveland, Ohio

## **The Economy, Employment, and Automation**

The years 1954 to 1962 saw an increase in the dollar value of the automated equipment industry of four billion dollars—a growth from three billion to seven billion dollars. The number of computers increased from only 244 installed in 1955 to 5400 in 1960 and 23,000 in 1965.<sup>1</sup> Unfortunately, this great surge in computer and automated equipment sales coincided with a relatively poor level of performance in the economy and a relatively high rate (5%) of unemployment. Because of the labor-saving nature of much of this equipment, this great boom in the sale of computers was labeled as the cause of the high level of unemployment and was also the basis for gloomy predictions of continual and growing unemployment. One union economist predicted, for example, that automation would destroy over 40,000 jobs per week.<sup>2</sup>

With such a convenient scapegoat at hand, many overlooked the basic cause of lower employment—an inadequate level of private demand. It is estimated that economic growth exceeded productivity increases and labor force growth in only six of the twelve years between 1954 and 1966 and, accordingly, during the other six years unemployment rose.<sup>3</sup> It wasn't until demand began to grow in the early 1960s that the employment picture improved, although the growth rate (4.9% of gross national product since 1961) was still short of the 5.2% needed to reduce unemployment to 4% by the fourth quarter of 1964.<sup>4</sup> The U. S. Bureau of the Census reported unemployment rates of 5.5% in 1960, 5.7% in 1963, 5.2% in 1964, and 3.8% in 1966 and 1967. By 1969 unemployment had dropped to only 3% with over 54,000 computers installed.<sup>5</sup>

Eventually, of course, the importance of de-

mand was recognized. The projection of an annual rate of 2.65% increase in the standard of living leads to an estimate of an approximately \$858 billion gross national product in 1975, assuming a continued increase in productivity of 2.45% per year. The production of such an output would require the employment of about 88.7 million workers out of an anticipated work force of 91.4 million, leaving an unemployment rate of only 3%. This represents a net gain of 18 million jobs. There will be a need for 4.5 million more professional and technical workers by 1975 (an increase of 54%) and an annual increase of 1.3% in manufacturing.<sup>6</sup>

Automation was no longer feared but became recognized as the way to maintain the necessary growth rate so essential to high levels of gross national product, standard of living, and rate of employment. As a matter of fact, the pendulum swung in the opposite direction and by 1966, with computer installations projected at 200,000 by 1975 and 375,000 by 1980,<sup>7</sup> great shortages of personnel were predicted. The following statement by Mr. David B. Hertz, a director of the management consulting firm, McKinsey and Co., was fairly typical:

In terms of immediate practical effects, neither the technical trends nor the challenge they pose to top management are the overriding issue of tomorrow—and the day after tomorrow. The overriding issue is people—specifically, skilled computer personnel. These, not the hardware, are the limiting resource. Already the supply is far short of the demand and the gap is widening inexorably. For the foreseeable future there is literally no possibility that we shall have enough trained people to go around.<sup>8</sup>

ELISE G. JANCURA, CPA, is Assistant Dean of the James J. Nance College of Business Administration of The Cleveland State University and an Associate Professor of Accounting and Computer and Information Science at that institution.

A most capable and effective speaker on the subject of computers, Miss Jancura was formerly an Advisory Systems Engineer with International Business Machines Corporation.

Miss Jancura is a member of AICPA, Ohio Society of CPAs, AWSCPA, ASWA, Association for Computing Machinery, and American Economic Association.



Despite the optimism of Mr. Hertz's statement, the last year and a half has produced a marked increase in unemployment. Figures released at the end of 1970 show an unemployment rate close to 6%. This time there is a better recognition of the forces which affect the levels of employment and unemployment and less fear of the impact of automated techniques.

There can be no denying that the great increase in technological innovation during the past two decades have wrought, and will continue to do so, great changes in the kinds of work available. It is estimated that the average period of time between technical discovery and commercial implementation has been reduced to fourteen years as compared to the thirty-seven years prevalent prior to World War I. Whole new job categories—such as programmer and computer operator—have developed since the mid 1950s, while others—for example, elevator operator—are disappearing. While there is some disagreement as to the educational and skill requirement changes involved, there is no disagreement among the various writers about the vast amount of relocation and adjustment involved. To the individuals involved, the matter of relocating the supply of labor for the economy as a whole can represent a painful and upsetting change in the highly subjective areas of familiar routines and job satisfaction and status. What is simply a ripple to the economy as a whole can represent quite a movement to an individual industry and an earthshattering experience to an individual.

### **The Banking Industry**

Automation has had an especially sharp impact on banking, insurance, air transportation, and communications. With its great spurt in computer usage, the banking industry provides a very interesting area for study. The use of computers by banks of various sizes over a twenty-year period is illustrated in the following table:<sup>9</sup>

	SIZE OF DEPOSITS (In Millions)				
	Over \$500	\$100 to \$500	\$50 to \$99	\$10 to \$49	Under \$10
1955-60	27.8%	7.8%	1.0%	.0%	.0%
1960-65	92.2	85.6	52.6	11.6	1.3
1965-70	100.0	98.8	84.6	59.0	19.3
1970-75	100.0	100.0	90.5	67.8	37.9

It is expected that the number of computers actually installed in banks by 1975 will be 6,000.<sup>10</sup> But this figure is misleading, for there are many smaller banks which are cooperating in joint computer installations such as Bankers

Data Processing, Inc., which is a joint effort installed in August 1965 to provide for the data processing needs of ten banks which own it. Other smaller banks are able to purchase services from larger banks such as that provided by the First Wisconsin National Bank to 95% of Wisconsin's banks.

There are two reasons for the great increase in computer usage in the banking industry. The first of these is to make operations efficient enough so that the banks can render the service demanded of them. In demand deposits alone, a 128.8% increase in gross national product coupled with only a 38.5% increase in demand deposits would increase transaction volume 74%.<sup>11</sup> The second big use is in the provision of new and expanded services—rental collections, payroll preparation for clients, retail credit servicing, and data processing services to smaller correspondent banks. It has been estimated that a bank could generate 10 to 15% in net earnings from automated customer services. The serious profit squeeze that banks have experienced in the last two years when the very tight money situation has seriously impacted banking's earnings from the more traditional credit activities make these additional sources of income attractive and necessary.<sup>12</sup>

The upward trend in the use of computers actually has not had the effect of reducing the total number of employees—rather it has added additional job categories while the higher volume of transactions handled by banks has raised total employment. The number of employees is expected to increase in the banking industry at an annual rate of 3.3% per year until 1975, producing an increase in number of employees of 336,000 from 1964 to 1975.<sup>13</sup> These projections of increased employment do not overcome the anxiety of individual employees fearing a loss of their jobs or a loss of status and/or prestige as their jobs are changed. Certain jobs will be eliminated—these are primarily those concerned with manual tasks such as check sorting and posting operations (key driven bookkeeping machines posting to statements are included in this category). At the same time there is a growing need for operators of the magnetic ink encoding machines, computer operators, programmers, systems analysts, procedural manual writers, and salesmen for the new customer services. While some of these operations require higher training levels, others, such as the encoding operation, are comparable in the skills required for the previous jobs.

Despite the fact that the goal of automation is to release man from the execution of repetitive, unthinking tasks so that he may turn his attention to more creative work, such re-

lease can only come through innovation—and innovation is often upsetting to the older, more settled employees. This is especially distressing if the new system either replaces procedures developed by the old employees or raises the fear of loss of position.

### ***Woes of Conversion***

A survey was conducted among seven medium sized banks in the Southwest which instituted electronic data processing.<sup>14</sup> All seven experienced personnel difficulties and fairly strong resistance to the automation process. This resistance took many forms. In some cases there was outright sullenness and increased griping. Other reactions included a running commentary on why the new system was undesirable and inefficient. Still other reactions were deliberately sloppy work, indifference, increased absenteeism and tardiness, more grievances, and strongly suspected restriction of output. This reaction occurred in first line management as well as in the clerical and accounting areas, indicating that the fear of loss of prestige and status was as important to supervisors as fear of loss of jobs seemed to be to the clerical employees.

There is a surprising difference of attitude among the people with less than two years of service and those with two or more years. The newer people, who had no vested interests and felt no particular fear of re-entering the job market which they had fairly recently left, seemed to accept the changes much more readily and calmly. Their attitude seemed to be one of little concern over the current job, with a high degree of confidence in their ability to obtain a new job.

The problems of employee resistance generated three major approaches. One was an attempt to educate employees to the new system and its effects. Unfortunately, since this action was not part of the early work, its effectiveness was limited. Some of the most troublesome persons were eliminated through the process of attrition—approximately one in ten employees left this way. The most frequently used tool in this situation was the ultimatum—this, of course, contributed somewhat to the general problems of employee dissatisfaction and resistance.

In trying to develop an approach to the most effective program of computer implementation and employee relocation, it should be remembered that the problem is primarily a human one. At the same time, it should not be forgotten that the primary objective of personnel policy is to get jobs done effectively, economically, and with as little friction as possible.

Whatever one's views on the motivation of

personnel policies, it does appear that smooth transition to automated operations requires some attention to several important principles. First, personnel should be kept fully informed. In many cases, fear of the unknown is cause for greater alarm than the worst news. Second, there should be honesty regarding the areas where work will be reduced and plans should be established as early as possible for the relocation and/or retraining of the people affected. Third, to the extent that it is possible, employees should be allowed to participate in the planning. Many times "old timers" will have invaluable information which is not formally documented tucked away in their memory. As a bare minimum, employee suggestions should be courteously received and at least acknowledged. Fourth, management should make known the bank's goals and policies early in the program and specifically should indicate its plans regarding changes affecting the employees. At the least, this would assure employees that they are being considered.

The fifth principle is that management should plan ahead. The conversion period invariably brings an extra work burden; overwork is a common condition during the period of changeover. Advance planning regarding adequate facilities and help during this period can help ease the pain of the installation itself. Sixth, sufficient time should be allowed for the changes to take hold and to become familiar to the people involved before expecting high performance levels. Seventh, top management should involve itself, at least to the extent that it endorses and enforces personnel policies and promises.

### ***A Success Story***

Contrasted with the fairly difficult adjustment period experienced by the seven banks mentioned above is the success story of a bank in the Cleveland area. The relatively trouble-free growth of this bank's data processing system from a punched card system, handling essentially just its own internal records and trust fund accounting, to a large multi-computer installation handling all demand deposit and check-clearing operations and providing outside customer services such as credit card accounting, trust accounting, payroll services, and tenant accounting, is a tribute to the solid planning and honest approach to the question of change to a necessary new system. By establishing a deliberate, well-paced plan and scrupulously upholding the promise that no employee need fear for his job as a result of the changes, Cleveland Trust was able to obtain cooperative acceptance of the new techniques even if some of the older employees were nostalgic for the older ways.

The bank's development of an automated information handling system has essentially taken place in two phases. The first phase (largely in operation by 1967) was primarily concerned with the conversion of manual and punched card operations to computerized operations. The second phase, still under development, is one which involves a program of re-evaluation and improvement of the computerized techniques as well as a continuing increase in the number of activities included in the bank's automated information system.<sup>15</sup>

The greatest change in the first phase came in the handling of demand deposits. Here there were two innovations—the first was the decision to centralize the proving and bookkeeping functions.<sup>16</sup> This, of course, affected the branch offices by eliminating these activities in the branches. Secondly, the methods of accomplishing these two operations were changed. The proving operation was made a part of the encoding procedure by which the amounts of checks and deposits are recorded in magnetic ink on the documents (the account number has already been preprinted in magnetic ink before sending the blank checks and deposit slips to the account holders). These encoding machines, which are key driven, have tallying and block sorting capability so that, once proved, checks can be routed to the proper banks for payment. Here the change has not been one of numbers of employees, but rather simply a shift from one type of manual key-driven operation to another.

The next step in the processing of demand deposits is the sorting of deposit tickets and checks drawn on Cleveland Trust into account number sequence. This is done automatically by means of the magnetically recorded account numbers; then the posting of these items is done by the computer. This operation had a large impact on many employees, for the sorting and posting was previously handled manually by file clerks and bookkeepers. After posting, the checks are sent back to the branches where the checks are "paid." This means that signatures are manually verified and the decision is made whether to cancel and deduct the check or not. Ultimately, as new facilities are built at the central location, it is anticipated that this operation will be centralized. Statements are printed monthly on a rotating basis by the computer.

Typically, each branch office sends in its checks and deposits for encoding and posting and then handles its own "paying" and customer relations. The operation for the downtown office is essentially the same as those throughout the company and thus is a good illustration. Prior to automation this office had 59 employees, of which 20 were bookkeepers

and 10 were file clerks. The rest were service personnel providing research activity, customer services such as duplicate statements and stop-payment service, and internal banking analyses. After automation, this office was reduced to 45 people. Replacing the 30 bookkeepers and file clerks are 16 "paying clerks." Significantly, there was no reduction in the service personnel.

As it is the bank's announced policy that no one be laid off as a result of such innovations, the reduction in work force was carried out through transfers and the normal attrition. It is estimated that, in this job area, the normal turnover in personnel is 20% per year.<sup>17</sup> The increased workload of parallel operation and checkout occupied the work force until attrition reduced the work force and the normal work load took shape. This procedure worked well, for the bank proceeded to automate its branches on a deliberate pre-planned schedule which allowed for adjustment of the hiring policy in a branch prior to the change. Six months prior to the changeover, the branch ceased to hire permanent employees for the operations to be affected. Thus as time goes by, the operation can accommodate the change comfortably and logically.<sup>18</sup>

The estimated competence level of the paying clerks is slightly lower than that of the previous bookkeepers. The job is much more routine and carries a lower classification. Furthermore, the results are not quite as good as far as the quality of work, for there is not a break-in period as previously offered by the position of file clerk, which eventually led to a bookkeeper's job. Generally speaking, the attitudes expressed by the members of the department were cooperative and indicated acceptance of the new system, although not necessarily preference for it.

Overall, some 400 bookkeeper and proof clerk positions were eliminated in the 78 branches. However, there was not one employee laid off. A policy of internal advancement has meant that candidates for the data processing department have been selected from within the bank organization and training has been provided by the bank. The programming and systems staff was increased to 40 members by 1967, and there were an additional 50 jobs in the input preparation and balancing departments. The machine room operators averaged about 15 per shift. Furthermore, growth in the following three years produced a "computer department" staff of about 205 individuals.<sup>19</sup>

The growth of the data processing department opened new avenues for advancement—from operations to programming to systems analyst to supervisor to computer systems

officer. A computer systems officer is considered to be on the same level with an assistant treasurer, while a senior systems analyst is on a par with a department manager. People from the data processing department have also received promotions to management in other areas when their research into the operations of these areas has made them particularly knowledgeable in those areas.

As the computer operation has matured, it too has been faced with the need for change and readjustment. There is an increasing emphasis on cost justification and treatment of computer facilities as an economic resource. Techniques are sought to make it possible to handle greatly increased volumes and to do it more efficiently. This involves even more careful planning and cost analysis and a willingness to accept and implement change in the form of new techniques and equipment. Thus the availability of faster computers means that three S/360's can be replaced by two S/370's; less expensive yet faster tape drives reduce the number of these devices required previously. Changes such as these will ultimately reduce the need for machine room staff from 45 to about 30. Overall the reduction in the total data processing staff over the next year is expected to affect about 20 of the current staff of 205.

Again, the bank's policy is to make transi-

tions as painlessly as possible. Changes are planned in advance; thus the reduction can be accomplished with the policy of "no layoffs" by phasing conversion plans so that the rate of job elimination matches the rate of normal attrition. This means that employees who leave the department are not replaced. "Normal" attrition includes those employees who retire from the business world, who leave to accept positions with other firms, and who transfer to other departments of the bank either through promotion or lateral movement.

The transition to automated techniques and the continued developments in this area have proceeded logically and with minimum dislocation at Cleveland Trust. This has been due largely to a carefully developed plan which tried to anticipate areas of difficulty and provide solutions ahead of time. At the same time, the whole project has been placed on a realistic base which recognizes that the object is not to reduce the payroll and eliminate other costs so much as it is to provide an adequate operating base to handle the increasing processing load without undue expense. Not only has the bank been able to handle larger numbers of accounts with increasing volumes of transactions, but it has moved into such additional service areas as payroll processing for clients, accounting services for correspondent banks, tenant accounting, and credit card services.

#### FOOTNOTES

<sup>1</sup>Elias M. Awad, *Automated Data Processing* 2nd Edition, (Prentice-Hall, Inc., 1970), p. 36.

<sup>2</sup>"Machines Won't Take Over After All," *Business Week*, October 8, 1966, p. 93.

<sup>3</sup>National Commission on Technology, Automation, and Economic Progress, *Technology and the American Economy* (U. S. Government Printing Office, 1966), p. 13.

<sup>4</sup>Charles E. Silberman, *The Myths of Automation* (Harper and Row, Inc., 1966), p. 43.

<sup>5</sup>Awad, op. cit., p. 36.

<sup>6</sup>Bureau of Labor Statistics, *America's Industrial and Occupational Manpower Requirements, 1964-1975* (U. S. Department of Labor, 1966), p. 9.

<sup>7</sup>Awad, op. cit., p. 36.

<sup>8</sup>"The Problem Is People," *Banking*, April 1966, p. 111.

<sup>9</sup>"The New Challenges in Bank Automation," *Burroughs Clearing House*, July 1966, p. 31.

<sup>10</sup>Constantine Konstans, "Automation and Commercial Banking: A Perspective for CPAs," *The Ohio CPA*, Spring 1967, p. 58.

<sup>11</sup>American Bankers Association, *The Commercial Banking Industry* (Prentice-Hall, Inc., 1962), p. 9.

<sup>12</sup>David C. Casey, "Bank Management: Problems and Possibilities," *Business Horizons*, June 1970, p. 45-52.

<sup>13</sup>*America's Industrial and Occupational Manpower Requirements, 1964-1975*, p. 16.

<sup>14</sup>Donald H. Sanders, "Personnel Problems in Automation Changeover," *Banking*, September 1965, p. 91-93.

<sup>15</sup>Interview with Jerry McElhatton, Vice President, Cleveland Trust Company, February 12, 1971.

<sup>16</sup>Interview with R. L. Pelleriti, Assistant Vice President, Cleveland Trust Company, May 15, 1967.

<sup>17</sup>Interview with K. C. Sainberry, Assistant Treasurer, Cleveland Trust Company, May 15, 1967.

<sup>18</sup>Interview with J. Ross Rothermel, Vice President, Cleveland Trust Company, May 18, 1967.

<sup>19</sup>McElhatton.