A STUDY OF EFFECTS OF MECHANICAL DEVICES IN ACCOUNTING ON AUDITING

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CHAPTER I

THE PROBLEM

Mechanical devices such as rubber stamps, typewriters, adding machines, calculators, and posting machines have been used for many years. Today, higher degrees of mechanication in the form of punched-card and electronic equipment are being used to process accounting data. With mechanization, accounting has become automated to the point of elimination of human effort. Generally accepted accounting principles are not altered by machine methods, nor do they reduce the necessity for the external audits conducted by professional accountants. However, accountants do agree that mechanical devices have affected the independent auditor's work because mechanically produced records are easier to read and increased information is available for account and cost analysis.

PURPOSES OF THE AUDIT

During the past fifty years, a gradual change has been made in the primary purposes of the audit. Originally, audits were conducted to detect fraud. In more recent years, audits have been directed toward reporting on the financial statements issued by management to stockholders and creditors. In conducting an audit, the auditor is interested in:

(1) safeguards against fraud, (2) prevention of errors, and (3) testing effectiveness of procedures to prevent fraud and errors by checking certain types of transactions.[1]

Discovery of errors and irregularities is still an objective, but not the primary objective of an audit. This change may be attributed to more formal business organizations and operating units large enough to employ staffs which permit internal control. The purpose of an examination is a matter determined by agreement between the client and auditor.

AUDIT IMPLICATIONS

In order to arrive at an informed opinion with respect to the company's operations and financial position, the auditor goes through the basic auditing procedures whether "pen and ink" or electronic equipment is used for preparing accounting records. Audit procedures must be adapted to mechanically produced records; however, the fundamental purposes of auditing remain the same. The new procedure problems created by mechanization do not alter the responsibilities or principles by which the auditor is governed.[2]

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[1]Joseph Pelej, "Electronics and the Accountant," Progress Through Sharing, (New York: The Institute of Internal Auditors, 1954), p. 20.

[2]J. Sanford Smith, Punch Card Accounting and the Professional Accountant, (London: British Tabulating Company, Limited, n. d.), p. 20.

Principles governing the auditor and the responsibilities he accepts are not altered by a change from manual to mechanical methods. The auditor must examine accounts, report whether the balance sheet is in accordance with the company's books, and whether the balance sheet indicates accurately the position according to the figures and explanations given. To evaluate data properly, the auditor must study the entire accounting system to establish that all transactions are recorded after proper authorization.

Much of the work performed by the auditor does not change by increased mechanization.[3] Many of the auditor's techniques in a manual system are of equal importance in an electronic installation. The auditor is required to determine the existence of major assets, such as cash, accounts receivables, inventories, and investments, by physical inspection or independent confirmation from external sources. The adequacy of reserves, provision for taxes, and total liabilities should be verified.

In mechanized accounting systems, deviations from the normal occur less frequently than in manual methods.[4] Usually, test checks of transactions in a mechanized system would be considered more dependable than in manual methods. It is

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[3]A. B. Toan Jr., "Auditing Electronically Produced Records," Presented at the National Conference of Electric and Gas Utility Accountants, New York, April 16, 1956.

[4]Smith, op. cit., p. 25.

reasonable to expect that all items in a batch have been processed in a mechanized system; whereas, in a manual system each item is handled separately. Adjustments recorded in mechanized systems are more complicated and require observation. Every adjustment should be scrutinized and approved.

The effectiveness of test checking records produced by cards is occasionally uncertain; however, when complete, the records are as easily test checked as those compiled by other methods.[5] The flexibility of mechanized equipment permits preparation of information for the auditor in forms which enable a more satisfactory test check.

Supporting data and schedules produced mechanically should be verified in a manner similar to those prepared manually; however, the number of test checks may be reduced because of the methods used. The auditor should be satisfied that all records are available for review, but the number of transactions selected for test checks depends upon the circumstances.

The scope and extent of audits should be influenced by mechanical record keeping, since they are more reliable than manually produced records. It is necessary that the original records and ultimate results are correct; the

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[5]Norman V. Bellenoit, "Special Problems in Auditing Records Kept on Accounting Machines," The New York Certified Public Accountant, 17:605-9, September, 1947.

intermediate stages are not a matter of auditing principle but mechanical detail. Mechanization is a change in methods and not in objective or principle.[6]

In manual methods reliance is placed upon the ability and intelligence of the individual and any record is susceptible to individual and unrelated errors. Human factors are utilized to a minimum in mechanized accounting and the results obtained are correspondingly reliable. The machine has no morals, no good or bad days, and no problems of training or supervision. Once a successful program is selected, the machines will perform accurately, detect errors and differences, and make numerous types of decisions.

Computing and recording mechanically are very efficient; yet, there is no foolproof equipment available.[7] Errors can occur from mechanical failure, but the greatest number of errors result from incorrect recording of information.[8] Machine errors should be detected before the document leaves the machine department if the system of internal control is valid. The possibilities of irregularities and errors created by machine operators should not be overlooked by the auditor.

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[6]V. S. Hockley, "Machines and Auditors," Accountancy, 65:132, April, 1954.

[7]Bellenoit, loc. cit.

[8]Smith, loc. cit.

Machine accuracy is the responsibility of the manufacturer, but the auditor should not rely solely upon the manufacturer.[9] Machines when operating properly can attain a level of accuracy which surpasses any human achievement. The most common method of checking machine accuracy is the use of test decks. The auditor must observe the machine when processing test decks and compare the results with predetermined answers in order to validate machine accuracy. Actual transactions should be checked against independently calculated solutions to establish correct results.

The auditor should be able to determine the validity of internal checks, but he need only to inquire if the built-in machine checks are functioning properly. Built-in checks include double circuits and double arithmetic, whereby two independent machine functions perform fundamentally the same processes and check each other.

STATEMENT OF THE PROBLEM

The purpose of this study is to analyze the effects of mechanical devices on the work of the professional accountant. Mechanical devices include common manually operated office machines, as well as accounting machines, punched-card and electronic equipment. In this study, the emphasis is directed

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[9]A. B. Toan Jr., "Auditing, Control and Electronics," The Journal of Accountancy, 99:42, May, 1955.

toward the work of the auditor whose procedures are designed to test the adequacy of internal control or to establish the integrity of specific items appearing on the financial statements.

The data presented in the study are to indicate the effects of mechanization on the scope of the audit determined by internal control, audit trails, timing of the audit, and assistance in conversion. Also presented are the data concerning the knowledge of mechanization required for conducting an audit, advantages and disadvantages of mechanization, and the use of machines by the auditor in conducting an audit.

DEFINITION OF TERMS USED

Accounting. Accounting is the recording and reporting of transactions, maintaining of transaction records, testing the operating effectiveness of controls and accuracy of the records, periodic reviewing of transactions and making known to others the information revealed in and implications derived from such summaries.[10] This work can be separated into the following phases: (1) internal control and systems design, (2) bookkeeping, (3) internal auditing, (4) external auditing, and (5) reporting.

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[10]Eric L. Kohler, A Dictionary for Accountants, (second edition; Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1957), p. 10.

Mechanical devices. For the purpose of this study, mechanical devices will be interpreted in the broad sense and includes manually operated machines as well as the more complex punched-card equipment, electronic computers, and other electronic machinery.

Auditing. Auditing is a critical review performed by an auditor to establish validity of documents supporting transactions and to determine the adequacy of controls underlying the records of the business. An audit may be either internal or external. The internal audit is carried out by a company employee as a staff function and is an important element of internal controls. The external audit is conducted by a person contracted by the business.[11]

Auditor. An auditor is a person who examines books of account and records kept by others. An internal auditor is a regular employee of the company; however, an external auditor works in a professional capacity.[12] For the purpose of this study, the auditor will be used interchangeably with auditor and professional accountant.

Professional accountant. The professional accountant is the external auditor who certifies the accuracy of the internal accounting work carried out by the accounting department of a particular concern. The professional accountant is

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[11] Ibid., pp. 10, 204, 263.

[12] Ibid., p. 45.

a certified public accountant who has met certain education and resident requirements and is registered to practice public accounting.[13]

Audit techniques. The methods available to the auditor for obtaining competent evidence are audit techniques. These techniques are tools used by the auditor and are classified into primary and secondary groups. Primary techniques provide more reliable information or evidence and include physical inspections, written confirmations and vouchering. Secondary techniques may be oral inquiries, account analysis, comparisons, clerical verifications, and scanning.[14]

Audit procedures. Audit procedures are the applications of audit techniques to a particular audit determined by the circumstances of the situation.[15]

Audit trail. The audit trail is the provision for following an auditable record that shows the details of movement in an account and provides means of moving back from the entry to the original document supporting the entry.[16]

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[13] Ibid., p. 389.

[14] J. K. Lasser's Tax Institute (ed.) J. K. Lasser's Standard Handbook for Accountants, (New York: McGraw-Hill Book Company, Inc., 1956), p. 2.140.

[15] Ibid.

[16] Joseph Pelej, "How will Business Electronics Affect the Auditor's Work?" The Journal of Accountancy, 98:41, July, 1954.

Internal control. Internal control is the division of duties among the employees in a business in such a manner that no one individual has complete control over a business transaction and that the work of each employee is checked by at least another employee. The purpose of internal control is to protect the company against fraud and to increase accuracy in recording transactions.[17]

Programming. Programming is the planning of a schedule of machine operations in the order in which they are to occur. These programs are for the punched-card and electronic data processing systems. These programs are designed to use control panels with wires to carry the impulses to direct the machine actions.

Test deck. The accuracy of punched-card or electronic equipment may be checked by using punched-cards containing theoretical transactions. Some of the transactions may be deliberately designed to violate the machine processing controls. The results are compared with predetermined solutions to establish the accuracy of machine operations.

PROCEDURES

The data for this study were derived from an extensive review of current literature concerning audits of mechanized

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[17]Kohler, op. cit., p. 45.

systems and replies to questionnaires sent to professional accountants. The steps in the procedures were:

1. An extensive review of literature about auditing mechanized accounting systems was made. The data were collected from periodicals, house organs and books.
2. Certified public accountants practicing in Kansas were selected from the Register of Persons and Firms Entitled to Practice as Certified Public Accountants.[18] A number of certified public accountants were partners of employees of public accounting firms; where this situation existed, only one questionnaire was sent to the firm manager to eliminate duplicated information.
3. A preliminary questionnaire was prepared and revised according to recommendations made by the faculty.
4. A test check was made by submitting the questionnaire to six certified public accountants to establish the validity of the instrument and availability of the data.
5. The questionnaire, revised according to the results of the test check, was submitted to the certified

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[18]State of Kansas Board of Accountancy, Register of Persons and Firms Entitled to Practice as Certified Public Accountants (Topeka: State of Kansas, 1958), pp. 23-43.

public accountants selected. Due to inadequate responses, two additional follow-up letters[19] and additional copies of the questionnaire[20] were sent.

6. The information derived from the review of literature and an analysis of the questionnaire was summarized and interpreted. Conclusions and recommendations were formed from the data collected.

In Chapter II of this study, a review of literature concerning the effects of mechanical devices on the auditor's work is discussed. The data gathered from the questionnaires are analyzed and interpreted in Chapter III. The final chapter is a summary of the findings and conclusions and recommendations based on the results of this study.

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[19] Appendix, pp. 69-70.

[20] Appendix, pp. 71-74.

CHAPTER II

BACKGROUND FOR THIS STUDY AS REVEALED IN CURRENT LITERATURE

Since the problem studied concerns a relatively new phase in auditing, no significant research was found concerning this study. Therefore, a review of related research which frequently appears in a thesis could not be developed. An attempt is made to present general background information pertinent to an analytical consideration of the effect of mechanization on auditing.

To appropriately prepare the reader of this study, factors concerning the auditor's work are presented in the discussion of: internal control, knowledge of mechanization, assistance in conversion, audit trails, timing of the audit, mechanization advantages and disadvantages, and mechanized auditing.

INTERNAL CONTROL

As a result of an audit engagement, the auditor issues reports disclosing the adequacy and fairness of the statements, whether or not the accounting principles are applied in a manner which fairly indicates the position and results of the operation, and the scope of the audit. This report

is supported by the auditor's review of the internal control and accounting procedures made in accordance with generally accepted standards.

As an analyst and interpreter of financial data, the auditor cannot neglect a client's mechanized accounting installation, but should be interested in the quality of tools used and the impact the tools have on the established controls.[1] The auditor is obliged to test the accounting records to satisfy himself that the internal control system is functioning properly and is adequate for the circumstances of the concern.

According to Hockley, it is logical for the auditor of a mechanized system to begin an audit in a pattern similar to the following: (1) examine the system of internal control or obtain a written statement about the system from management, (2) test the functions of the system to determine the extent of control in force, (3) examine the system to determine the records produced by machine, and (4) test the operation of the mechanized system to establish that the sources of original entry are properly covered by the mechanical process.[2] If the procedures are followed, the auditor will acquire the facts on which to continue the audit.

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[1]Joseph Pelej, "How Will Business Electronics Affect the Auditor's Work?" The Journal of Accountancy, 98:36, July, 1954.

[2]V. S. Hockley, "Machines and Auditors," Accountancy, 65:130, April, 1954.

Proper evaluation of internal control is a requisite to the issuance of an unqualified certificate by an auditor. In examination of internal control, it is important to review the organization of the accounting machine department, and to determine how it fits into the company organization. The best internal control is obtained when the machine department operates in a staff capacity and performs services for departments where the checks and verifications are established.[3]

For internal control to function properly, there should be a distinct separation of the three operations: (1) authorization of transactions, (2) recording of transactions, and (3) maintaining custodianship of assets.[4] A properly planned mechanical installation will improve internal control by separating data recording from data processing. Data processing may be centralized to insure maximum machine utilization without loss of internal control.

The segregation of operations may be determined from an analysis of flow charts or diagrams. A study of the flow of work, processes, and methods of controls through an accounting department should be made in detail at the time of the first

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[3]Norman V. Bellenoit, "Special Problems in Auditing Records Kept on Accounting Machines, "The New York Certified Public Accountant, 17: 605-9, September, 1947.

[4]Daniel M. Shonting and Leo E. Stone, "Audit Techniques for Electronic Systems," The Journal of Accountancy, 106:56, October, 1958.

audit engagement and reviewed during succeeding engagements as a part of the procedures checking of internal control.[5] From such a study, the auditor can determine if safeguards are adequate, or if results obtained are constant from year to year for comparison purposes.

The operation of controls may be observed by tracing actual transactions from the point of authorization to recording and comparing the movement with the flow chart. Points to be considered when a comparison is made include the following: (1) when was the information originally obtained, (2) who from, (3) who prepared it and how, (4) were actual conditions reflected, (5) what was done with it and who was it done by, (6) was the source of data valid and preserved intact, (7) what was the extent of approval and verification, and (8) can the data be produced if it is necessary to prove accuracy.[6]

Correction of errors and deviations from normal procedures should be properly authorized, preferably in writing. Defalcations have been made by manipulation of records maintained under mechanized methods; however, they were attributed to failure to provide an effective system of internal control and lack of fundamental safeguards necessary for procedures whether manual or mechanized.[7]

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[5] Bellenoit, loc. cit.

[6] E. S. Harris, "Public Accountant and Punched Card Accounting," L. R. B. & M. Journal, 37:14, July-September, 1956.

[7] Ibid., p. 19.

If the internal controls function properly, transactions subject to the controls must be recorded correctly.[8] If the entries are properly controlled from the point of origin to the final destination, they must be correct. Therefore, the bookkeeping records, vouchers, and supporting papers must be tested by the auditor to establish the effectiveness of internal control. The reliability of internal control and the manner in which it is carried out is of utmost importance to the auditor.

The scope of the audit is determined by the soundness of the system. The auditor's initial concern, to establish the fairness of the data in financial statements, commences with reviewing the internal control exercised by the company. It is in the important realm of internal control that mechanized methods appear to provide the greatest assistance to the professional accountant. Well designed, installed, and supervised controls may reduce the extent of detail checking of transactions by the auditor. When controls are not well designed or installed, the certified public accountant may need to continue tests to satisfy himself that the company's financial statements and operating results are fairly presented. Sound internal control principles apply not only to the general accounting departments but also to the accounting machine department.

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[8]Hockley, op. cit., p. 129.

The three areas which the internal controls should check are: (1) determining that the original data are authentic and accurate, (2) ascertaining that these data and only these data are recorded, and (3) determining that the forms or records and evidence supporting it will satisfy those who must attest to the integrity and accuracy of the records.[9] Accuracy of the original data may be verified by examining the time cards, screening requisitions, or matching vendor's invoices against purchase orders and receiving reports. In order to establish independent control over approved documents so that they, and only they, will be entered on the records, a check may be supplied. A simple control may be provided by an adding machine tape totaled for a group of invoices to be processed or totals of hours for a payroll. Check totals should be determined by someone not under the control of the machine center. To ascertain the effectiveness of controls exercised while the transactions were being processed, a post-examination of the results may be made by selecting transactions at random or items that appear unusual or incorrect.

Employees who have access to mechanized accounting records may have more duties to perform, and the division of work and responsibilities may expand. Internal control need not be weakened, since the less important duties will probably

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[9]A. B. Toan Jr., "Auditing, Control, and Electronics," The Journal of Accountancy, 99:41-42, May, 1955.

disappear first.[10] Controls enforced by fewer people with greater knowledge and appreciation of the transactions may be substituted for the division of duties. Additional controls may be obtained from machine programs and protection is gained by using the machine during the audit.

KNOWLEDGE OF MECHANIZATION

The rapid development and progress of accounting machines have created special circumstances for the auditor which causes an uncertain feeling when working with mechanically produced records.[11] Accounting machines have been developed to perform certain functions legibly, quickly, easily, and accurately. Final results of mechanical or manual methods are practically the same, except one is printed and the other written. Because of the complexity of automated equipment, impressions are based on a lack of understanding causing accountants to conclude that mechanization creates many problems.

Auditors tend to evade accepting new mechanized systems due to lack of understanding and knowledge about the equipment.[12] Frequently, the auditor is confronted with

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[10] Ibid., pp. 44-45.

[11] Bellenoit, op. cit., p. 604.

[12] Basil Regione, "Electronics--How Does it Affect Our Auditing Program?" Promoting Professional Progress. (New York: Institute of Internal Auditors, 1956), p. 17.

a new system at the time the audit is to be conducted. If the auditor could prestudy or become familiar with the systems during the installation, many of the situations which seem to be problems would not exist.

Most accounting firms believe more effective audits can be conducted if at least some knowledge of mechanized systems and methods work is acquired. New developments create new conditions. If the professional accountant is able to understand the basic fundamentals and operating principles, possibilities of later encountering difficult situations is eliminated.

It is not necessary for all accountants to go back to school to become electrical engineers; however, the auditor should acquaint himself with the main types of machines in use and their operating principles.[13] Facilities for learning about machines are offered by schools conducted by machine manufacturers. Other means of keeping informed about machines are: join a professional group such as National Machine Accountants Association, subscribe to professional magazines, visit showrooms for demonstrations, talk with equipment salesmen, get on mailing lists of equipment manufacturers and study their literature, and attend business shows.

The professional accountant must have some understanding of methods by which punched-cards are created before

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[13]Pelej, op. cit., p. 43.

they can be properly audited.[14] Tabulating machines used for recording accounting transactions on punched-cards are more flexible and faster than previous equipment. To perform adequate audits, certified public accountants must become experts in auditing and familiar with punched-card techniques and procedures necessary to determine the correctness of original entries and proper machine wiring.

Two views frequently expressed about the impact of electronic data processing on auditing are: (1) there will be no audit changes for professional accountants since audits can be conducted around the machines, and (2) drastic effects on auditing will result in elaborate training of machines by many professional accountants.[15] Since both views tend to be exaggerated, a more reasonable approach is that some audit techniques and procedures will need to change and a basic understanding of electronic data processing is necessary for effective auditing.

Without additional training, the auditor should be able to evaluate some internal control checks between departments as basic authorization functions and asset custodianship

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[14]Alexander S. Bell, "Auditing Records Maintained on Tabulating Machines," Illinois Certified Public Accountant, 17:45-59, September, 1954.

[15]C. R. Jauchem, "Impact of Electronic Data Processing on Auditing," N. A. A. Bulletin, 39:53, May, 1958.

or to ascertain authenticity of source documents if filed properly.[16] Some training would aid the auditor if he is to determine whether proper segregation of duties exists, or how data may be altered and instructions changed for collusion. If certain documents are discontinued as a result of automation, extra training would help the auditor make provision for a competent audit trail. The auditor will definitely need training to decide what accuracy or error detection devices are properly utilized, or if reconstruction of data in event of fire or mutilation is provided, or when maintenance policies are reviewed. Additional training will be necessary when journals, ledgers, and other internal records are replaced by invisible coded tapes or memory devices within machines.

The apprasial of controls built-in machines by manufacturers should be made by a technician.[17] Only an inquiry, whether any normal checks usually built-in the machines have been deleted through special techniques needs to be made by the auditor; otherwise, it can be assumed machines are accurate.

At the present, it is not considered essential for the auditor to be able to read or verify the accuracy of the

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[16]Robert G. Wright, "Electronics--A Challenge to Auditors," The Illinois Certified Public Accountant, 19:13 Spring, 1957.

[17]Price Waterhouse and Company, The Auditor Encounters Electronic Data Processing, ([New York]: International Business Machines Corporation, [1958]), p. 19.

program; only how the program is constructed and the types of checks which can be incorporated are primary factors.[18] Other checks can be devised and the accuracy of the program can be proved without having to check the programs in detail.

The development of programs is likely to become more complex and specialized. It would be unrealistic to expect an auditor carrying on a normal professional practice to master and keep up to date in programming methods. In order to advise clients about electronic installations, firms operating a management accounting department may wish to have a staff trained in programming. In some phases of electronic data processing, unless the auditor has made the necessary studies, the assistance of a specialist should be obtained.

ASSISTANCE IN CONVERSION

The relationship between the client and auditor determines the extent of participation by the auditor in plans for a new mechanical installation. Past experience discloses that clients usually do not inform their clients about proposed improvements in their accounting methods.[19] Formerly, the auditor had been able to adjust his audit procedures to the accounting systems in operation at the

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[18] J. W. Margetts, "The Auditor and the Computer," The Accountant, 139:278, September 6, 1958.

[19] Ibid., pp. 276-78.

time of the audit. Most accountants agree that up to the present, mechanization of bookkeeping had not greatly affected the independent auditor's work.[20] Some of the larger accounting firms help their clients install new equipment. Assistance is usually given by a staff member who specializes in various types of accounting machines rather than auditing.

The auditor desires to participate in mechanical installations to acquire knowledge aiding in subsequent audits; not to establish a detailed program for installing the equipment.[21] Cooperation in a mechanical installation permits the auditor to provide for fundamental audit requirements, to make certain that reliable internal and external controls are established, and to resolve that account balances and storage requirements are supplied.

When electronic data processing equipment is employed, it is not expedient for the auditor to wait until accounting information has been produced before deciding upon an audit program.[22] The professional accountant should be in contact with his client during the entire planning period and occasionally review the progress of the installation plan. It

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[20]Paul E. Hamman, "Audit of Machine Records," The Journal of Accountancy, 101:56, March, 1956.

[21]Norman J. Lenhart and Philip L. Defliese, Montgomery's Auditing, (eighth edition; New York: The Ronald Press Company, 1957), p. 561.

[22]Margetts, loc. cit.

is desirable for the auditor to assist in the early stages of conversion to electronic equipment in order to recommend the adoption of controls before the procedures are so definitely established that it would be a long and costly operation to make changes. The latest point at which the auditor should review an installation is when the basic features are determined and the computer is being tested.[23] To make recommendations before procedures are definitely established, it is desirable that the auditor check the progress of an installation at least twice.[24] The first check should be made when all details of the proposed installation have been recognized and programming instructions are being planned. At this point, the auditor can advise if additional controls are necessary for audit purposes. The second review should be conducted when programming is completed. Frequently, during the process of installation, programming variations are made; by examination the auditor can determine the effect on internal control and make further recommendations if necessary.

To check the internal control, the auditor should be present when the electronic data equipment operates simutaneously with the existing methods. Detailed comparisons of parallel records result in isolating and eliminating any

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[23]Pelej, op. cit., p. 42.

[24]Margetts, loc. cit.

errors which occur. During this same period, errors, both machine and data errors, should be created to insure the operation of program checks.

The contribution auditors can make in checking the computer is not to be overlooked. With knowledge of the clients activities, the auditor is in a position to know the type of problems the computer will encounter and can test the machine accordingly. The auditor must be aware of the various types of controls that can be built into a data processing system and see that the client is making full use of the available checks.

During the electronic installation, the auditor should assure himself that adequate records and information are available for conducting a satisfactory audit. Physical problems connected with the changeover to be considered by the auditor includes the storage space for records.

AUDIT TRAILS

Like the auditor of the past, the auditor of the present and future needs a suitable record which shows details of movement in the accounts and provides means of moving back from the entry to the original document supporting the entry. In any mechanical installation functioning properly, it should be possible to trace back from the end product, report ledger, or voucher, to source documents without reverting to punched-

cards or magnetic tapes. Procedure manuals and charts should be prepared and revised to reflect what actual procedures are in effect so it would be possible for new internal or external auditors to back track in the records.

Most records of today are visible and understood by the auditor; however, the main exception is certain punched-card procedures where the record is retained in punched-card files and information is produced only as needed. It seems logical for this trend to increase under electronic data processing methods which use punched-cards as well as punched tape, magnetic tape, magnetic drums, or magnetic discs.

The improvement in internal control more than offsets the audit trail problems created by machine development.[25] Three categories of information required for adequate audit trails are: (1) balances, (2) transaction analyses, and (3) underlying documents. Balances include the details that make up the control balance at a given date. Transaction information required by the accountant includes an analysis of totals for the period, whether directly affected in the accounts or not. The underlying documents of an audit trail includes the supporting documents for the balance and transaction details.

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[25]Price Waterhouse and Company, In-Line Electronic Accounting, Internal Control and Audit Trail, (New York: International Business Machines Corporation, 1958), p. 7.

Another problem is the elimination of detail records which shows items composing a total of an account. Some accountants believe this problem will not be serious because machine speeds permit a greater amount of information to be printed than is necessary. If information is not printed by the machines immediately, it will be retained until it is no longer necessary. It is believed that the controller or operator of the computing center will have sufficient information to trace the account details.

Perhaps audit trails is a misnomer since the reference infers that the auditor is the only one concerned about the type of records and information available. Frequently management makes more use of the audit trails during normal business operations than the auditor does during the examination. The joint interest of the auditor and management in an audit trail suggests that the requirements of both should be considered in installing an accounting system. To utilize a mechanical system to the greatest extent, provision for both the needs of the auditor and management should depend on other operations of the system.

TIMING OF THE AUDIT

It has been acknowledged that audits of electronic data processing records will have to be performed either at the time of processing original data or at a time closer to

the recording of transactions.[26] Alteration of the audit timing in the direction of auditing transactions close to the time of original recording avoids additional work required to reconstruct account details at a later date. Other motives for the professional accountant to audit records at an earlier date are the desire to make magnetic tape available for reuse sooner and to use audit trail references which can be kept readily available for a short period of time.

Advanced planning is required for audits in order to avoid overloading the machine department with special requests for information and report runs. If the auditor could have all the general ledger account analyses prepared by machine, it might be desirable to plan the entire audit a year in advance. Much audit time can be saved if short cuts and streamlined techniques are used; however, the auditor must have enough knowledge of the machines to recognize an area of potential savings.

MECHANIZATION ADVANTAGES AND DISADVANTAGES

Mechanized systems have advantages over manual methods; yet, mechanization is not always appropriate. If few entries of a uniform nature are posted, mechanization is not desirable. The success of accounting machines depends on the number of similar transactions recorded.

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[26]Carl C. Tietjen, "Changes in Public Accounting," The Canadian Chartered Accountant, 73:321, July, 1958.

Mechanical systems properly applied offer more accurate records.[27] Automatic addition, subtraction, and account balance computations are made as entries are posted to individual accounts. Control totals accumulated, while posting, provides mechanical proof of accuracy by indicating errors promptly. Transactions recorded simultaneously to several records contribute to the elimination of errors. Daily balancing reduces the monthly peak periods permitting statements to be sent to debtors immediately after the first of the month. Characters and figures produced by machine are usually neater and more legible, reducing mistakes.

The speed of machine accounting permits processing and summarizing of statistical data not previously utilized. More reports are made available since the cost is not prohibitive and machine methods are faster than manual procedures. Increased speed does not imply the elimination of employees. Machines perform tedious and routine computations and written functions; whereas, people perform work requiring judgment, tact, and prudence. The auditor is also relieved of burdensome computations and can spend his time studying and interpreting the data without having to do much writing.

A very important hindrance to machine accounting is that nearly all original documents are not prepared mechanically.

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[27]Kermit Pennington, "The Application and Use of Machines and Electronics in Accounting," L. R. B. & M. Journal 36:9, April-June, 1955.

The majority of underlying documents originate in longhand and must be transferred to a form which can be comprehended by machines. The new form frequently is difficult for the auditor to read unless the records are translated into words and figures. Another drawback to mechanical devices is the mass of paper which must be examined to study the transactions of a single account over a period of time. The lack of primary book records must be supported by an efficient filing system. Frequently, the original documents are wanted for a number of purposes, and a complex cross reference system must be established.

Machine accuracy cannot be guaranteed. If the operator injects wrong figures into the machine, the results will be incorrect. Although totals are accumulated automatically, problems may arise if machine registers are not cleared before using; incorrect totals are produced. Register clearances should be printed before each series of postings; however, complete independent checking must be provided to help alleviate errors. If error correction is attempted by machine operators, difficulties may occur. There should be a routine providing for error correction, and the responsibility for correction should be vested in someone with authority.

Manual methods are more economical than machines if scattered posting of a few digits is required or if the machines are used for purposes for which they were not designed. Although peak periods tend to be eliminated or at

least reduced by mechanization, they can be reduced to a degree in manual methods by planning and distributing the work.

MECHANIZED AUDITING

The skill of trained men is the primary requisite of professional work.[28] Mechanization is frequently regarded as unimportant, but much of the work assigned to a junior auditor could be accomplished by machine. Complete mechanization of auditing would be contrary to audit principles; nevertheless, mechanical devices would increase production and efficiency.

In auditing, extensive use of recorders or dictating machines is being made.[29] Information can be recorded faster by machine than by a stenographer. Recorders may be used in or out of the office, during any hour, or when typists are busy. The recorder's use need not be limited to correspondence, but may be used for checking items. Ledger posting checks which required two people may be reduced to a single person calling items over the recorder and proving by playing back the record. A time saving of at least 20 per cent results when a recorder is used to check items. The novelty of any mechanical equipment may temporarily reduce production

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[28]Frederick A. J. Couldery, "Mechanized Auditing," The Accountant, 133:61, July 16, 1955.

[29]Ibid.

but advantages surpass any reductions. Although entertainment may be derived from a recorder, it is not capable of arguing as a fellow worker could.

Photo copiers eliminate the necessity of the auditor copying extracts of deeds, leases, and agreements in longhand and reduce the opportunity for additional errors to occur. Copies may be produced in a few seconds time at a very low cost.

The use of metered machines for postage is becoming widespread. The machines are very convenient and considerable time is saved when statements are sent to debtors or creditors for verification. Automatic feeds, letter folders, envelope stuffers, and envelope sealers may be used to save additional time. Although these machines are not always portable, consideration should be given for use in the home office.

If a large number of coins must be counted, audit time and costs may be reduced by using a counting machine. A variety of machine models are available. Some will sort and count mixed coins; others are suitable for only one denomination at a time.

Although the adding machine can operate rapidly and accurately, it is surprising how many accountants do not have a machine in the office. Production can be expected to increase five times the manual output when an adding machine is utilized.[30]

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[30] Ibid., p. 63.

The increased production gained from using an adding machine is sufficient to warrant the purchase of a machine.

Many adding machines can perform other calculations such as those necessary for extensions, per cent rates, and dividend payments. Listing-adding machines can be used for such work as listing ledger balances. This may appear to be a simple operation; yet, few people can do more than one task at a time. A listing-adding machine can list and accumulate the balances at the same time.

Frequently, professional accountants use the client's equipment during audit engagements. In many engagements, they do not; but it is to the advantage of both the auditor and client to cooperate in using equipment during audits. A machine operator or supervisor of the client's staff should assist the auditor when special equipment is used. Occasionally, it is not possible to use the client's machinery during the ordinary working hours because current accounting would be delayed. The use of the client's equipment at night would be preferable to proceeding by manual methods.

Verification work should be scheduled as far as possible in advance at selected dates throughout the year to avoid peak periods and gain maximum production for the client and minimum audit time for the professional accountant. In order to strengthen the audit, surprise examinations can be made throughout the year.

The auditor must have some knowledge of basic fundamentals of machine accounting to recognize an opportunity to utilize the client's machines for streamlining his own work and reducing audit time. Since ideas for special audit reports and runs are initiated by the auditor, the concept that information is available through accounting machines must be developed by him. Ideas should be first discussed with the chief accountant and then referred to the machine accounting supervisor who would be able to determine if the information is already available or if it could be prepared, what additional work would be required, or if machine time was available.

Tabulating machines can be used for preparing account details in general ledger account analyses. In account examinations, all debits and credits can be listed or only specific items in excess of a designated minimum are listed and all items are accumulated to balance the account. Machine account analyses reduce the manual writing required by the auditor.

From the auditor's viewpoint, one of the best uses of tabulating machines is the reconciliation of bank accounts.[31] Copies of the reconciliation, complete with outstanding check details, facilitates cash verification; nevertheless, the auditor will have to check the reconciliation. Cash receipts

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[31]Gordon L. Hamrick, "Punched Cards as an Aid to the Auditor," Journal of Machine Accounting Systems and Management, 5:3, September, 1954.

and disbursements or other selected data may be reported by machine for special tests.

The extent of the audit of accounts receivable and payable varies. In most audits, there is a need for an aged trial balance of accounts receivable to determine the collectibility of accounts and the adequacy of the bad debt allowance. The aged trial balance may be prepared on the machines. A trial balance of the accounts payable can be easily verified and much of the clerical work eliminated. In many companies, machine-prepared statements can be sent by the auditor direct to the debtors or creditors for verification.

A major part of the professional accountant's time, during audits of industrial or commercial concerns, is spent in the verification of quantities and pricing of inventories.[32] Considerable variation is noted in the type of inventory records kept by machine. Some companies maintain perpetual records; whereas, others summarize physical counts and extend the unit prices.

In most companies employing accounting machines, extensive statistical information often is utilized by the auditor. If properly used, the information can assist the auditor in other phases of the audit. A review of sales products indicates slow-moving items in the inventory. Adequacy

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[32] Ibid., p. 5.

of sales tax may be determined from the sales by location analysis. To establish the accuracy of commission payments and accruals, an analysis of sales by employees may be used. Much of the clerical work can be eliminated when expenses are maintained by accounting machines. After reviewing operating expenses and other reports for unusual expenses and variation, accounts to be selected for analysis are chosen by the auditor. Account analyses and schedules can frequently be prepared on the machines. Auditors can be assisted by the preparation of payroll schedules on the accounting machines. The schedules generally are composed of a listing of employees in selected departments, number of hours worked, rate of gross pay, overtime, deductions and net pay. These are only a few of the potential areas which the auditor could utilize the mechanical tabulating equipment in a client's office.

It is suitable for the auditor to consider the extent to which electronic data processing equipment can be used to perform routine audit calculations. In the past, auditors have used punched-card installation during audits; however, the degree of use may not have been at the maximum. A few opportunities for the auditor to use the electronic machines would include the following: (1) to interpret machine sensible data stored on magnetic tape without a printed report to support it, (2) to foot balances and select items for further study, (3) to confirm account requests prepared by reference

to the name, address, and account balances stored mechanically, (4) to indicate variation of inventory details reported by comparing the inventory count with the recorded balance, and (5) to test the instruction program and system of operation by processing.[33]

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[33]Price Waterhouse, op. cit., p. 9.

CHAPTER III

THE QUESTIONNAIRE AND RESULTS

The information for this chapter was provided by questionnaires submitted to 132 certified public accountants selected from the Register of Persons and Firms Entitled to Practice as Certified Public Accountants. Only one accountant from each firm was selected. To obtain representative data from firms not replying, the initial letter of transmittal and questionnaires were followed by two letters and supplemented with additional copies of the questionnaire. A total of 85 responses were recieved; however, only 57 professional accountants' replies to the questionnaire were usable. The remaining 28 accountants either did not wish to participate in the study or were not practicing public accounting.

THE FIRMS

The responses from the fifty-seven accountants were tabulated. Forty-six of the firms participating in the study were general practitioners, and their clients did not specialize in a particular field of endeavor. Eleven certified public accounting firms specialized in one or more areas of auditing. Governmental accounting listed by five firms was

the area of most frequent specialization. The frequency and other areas listed were: three, retail accounts; two, wholesale accounts; two, oil accounts; two, service accounts; and one each, real estate, religious, and public utilities.

Clients of twelve public accounting firms had only manual accounting methods, two firms' clients used only accounting machines, twenty-eight used both manual and accounting machines, and thirteen firms' clients used a combination of manual, accounting machine and punched-card methods. Clients of one firm had manual, accounting machine, punched-card and electronic equipment.

Information in Table I indicates manual methods were most prevalent and the electronic machines were uncommon. Twenty-nine or 52 per cent of the public accounting firms reported between 90 and 100 per cent of their clients maintained manual records. Only six or 10 per cent of the firms indicated that 50 per cent of the clients records were produced on accounting machines. Two of these firms' clients used accounting machines exclusively. The largest number of clients using punched-card equipment was 20 per cent, reported by one firm. The balance of punched-card installations were 10 per cent or less. The firm reporting electronic equipment in use by clients reported two clients using this equipment. Although the major part of the clients use manual methods, the trend to mechanization appears to be increasing because

TABLE I

PERCENTAGE OF CLIENTS USING MANUAL, ACCOUNTING MACHINES, PUNCHED-CARD OR ELECTRONIC EQUIPMENT AS REPORTED BY PUBLIC ACCOUNTING FIRMS

Number of Firms	Per Cent of Clients Using Manual Methods	Per Cent of Clients Using Accounting Machines	Per Cent of Clients Using Punched-Card and Electronic Equipment
12	100		
2		100	
1	98	2	
5	95	5	
2	95	4	1
7	90	10	
1	90	9	1
1	90	7	3
1	89	7	4
1	88	10	2
1	85	15	
2	80	20	
1	80	15	5
1	78	20	2
3	75	25	
1	73	18	9*
1	70	30	
4	60	40	
1	60	39	1
1	60	30	10
3	50	50	
1	42	50	8
1	40	40	20
1	10	90	
1	10	80	10

*This figure includes 1 per cent electronic equipment.

a number of the firms noted that clients were studying the feasibility of mechanical systems for future installation.

AUDIT PROCEDURES

The consensus of the auditors' opinions is that there have been no real changes in the audit procedures for auditing mechanized records. The only change has been in the mechanics of how the audit procedures are performed. The auditor must still determine that the accounts and statements are correct and that all transactions have been recorded in accordance with generally accepted accounting principles. More attention is directed toward the originating documents and data to insure proper preparation for processing.

Thirty-two firms indicated they had no pre-determined procedure plans. Seven of the firms had plans which were altered to meet the circumstances. The conclusion reached is that each audit, conducted in accordance with the accepted principles, is different and must be considered in relation to records kept, internal control, and ability of personnel.

The reliance upon test checks is not materially altered by machine accounting. The primary factor for determining the extent of tests is internal control and not the machinery used.

The type of equipment used is of little importance when the extent of test checks is determined. The machines have a number of proofs or checks assuring that debits and credits

are equal but nothing to assure that proper recording was made. The machine accuracy depends upon the machine operator. If the operator is good, fewer tests will be required than if the operator has a tendency to make errors.

Machines frequently facilitate test checking, and increased speed permits additional printed records. The reliance of the test checks may be only to the extent that the test is representative of the records under audit. Unusual and irregular entries should be checked in detail.

The auditors' experiences have proved that machines have a very high degree of reliability; in addition, check points are built in the machines or systems. Thirty-one firms reported machine accuracy was checked in some manner during every audit; however, seven did not have specific audit procedures checking machine accuracy. The firms who did not check machine accuracy during the audits rendered the following explanations. As a specific operation, machine accuracy was not checked; but during the audit, footings were checked which is an indirect check on the machines. Proper internal control should enable immediate detection of a machine not functioning properly. Machine malfunctions would be disclosed in regular audit procedures. Test checks of the company throughout the year establish machine accuracy; therefore, checking machines is normally not considered a major audit problem.

Test decks, a provision for checking the machine, were used by eleven of the sixteen firms. The use of test decks cannot be adapted to all types of organizations such as brokerage houses. Test decks were reported to prove accuracy of the machine only at the time of the check; hence, the time checked was very limited. Test decks are usually used during the installation period to prove the accuracy when there are no other records to check; however, during machine operations accuracy may be checked by using original transaction cards.

INTERNAL CONTROL

The existence of mechanical or electronic equipment does not eliminate or reduce the need for internal control; it only changes its detail characteristics. Eighteen firms reported that internal control was equally important in any method of record keeping used. Internal control was considered more important in manual methods than in records produced by accounting machines by eighteen firms. Twelve firms considered internal control more important in manual rather than punched-card methods, and eleven firms considered internal control more important in manual methods than in electronic equipment. Only two firms indicated that internal control was more important in all of the mechanized methods.

No principles differ in manual or mechanized accounting; yet, mechanized machines usually provide for better control

the extent of internal control and interim work accomplished during the period. Continuous audits may be made at any time, but advanced planning may be required if the auditor is to be present for certain phases such as taking a physical inventory.

Sixteen firms stated that audits of records produced by accounting machines should be conducted close to the end of the fiscal year. Twenty-three reported that it was not necessary to audit the records close to the end of the period. Opinions were equally divided among the firms as to the time audits of punched-card and electronically produced records should occur. Eight firms reported audits of punched-card records should be conducted as close to the end of the year as possible; eight firms indicated that audits could be conducted at any time. Three firms indicated electronically produced records should be audited as close to the end of the fiscal period as possible; however, three firms did not believe this was necessary.

Normally, the audit is conducted near the end of the fiscal period; but a change may be the result of the amount of preliminary work done or prevailing circumstances. The type of equipment appears to have no effect on the timing of the audit other than the fact that greater mechanization tends to facilitate a more rapid closing. The time selected for the audit should be convenient for both the auditor and client and

planned accordingly. If the auditor is to use the client's equipment, the time of the audit may be influenced.

As was previously indicated, basic auditing principles and procedures are not changed by the methods of recording accounting transactions whether manually or mechanically produced. The records and reports remain relatively unchanged; variation occurs in interim processing. Certain practices must be followed, and the most significant fact is that the proper procedures and controls are developed and followed. The method of record keeping is of secondary importance if it is adequate.

The opinions of forty-four firms replying were equally divided to the inquiry if time was saved when comparing an audit of records produced manually to records produced by accounting machines. Twenty-two indicated time was saved, and a like number reported no time saving. The amount of time saved varied from two firms reporting 50 per cent to three firms saving 10 per cent. Other reports noted a saving of 30 per cent by one firm, 25 per cent by six, 20 per cent by two, and 15 per cent by four.

Eight firms indicated time could be saved when punched-card records were compared with those produced manually; however, eleven reported that no time was saved by the punched-card records. The time savings reported varied from 33 per cent reported by one to 10 per cent by two. Other time

savings noted were 25 per cent by one, 20 per cent by one, and 15 per cent by two.

Three firms reported that time could be saved when comparing electronically produced records to manually produced records. Five did not believe time was saved. One firm reported a time saving of 25 per cent.

The same auditing steps must be taken regardless of the type of recording methods used; normally, this would not reduce the amount of time by the auditor significantly. Some time savings can be made in furnishing data for the audit because of easier and faster means of analysis. It is also possible to obtain, in certain cases, analyses with equipment that would not be feasible with manual methods or accounting machines. In a few situations, equipment can be used to make test selections and listings that would otherwise have to be done manually.

Other factors to be considered are the quality of the work performed by company accountants under any system. Audit time is more related to its extent of testing and verification required than to the particular processing used. Proper installation of machine processes will tend to improve internal control and will usually demand a systematic flow of work which will reduce the extent of listings required.

Eight firms listed internal control or some phase as a contribution to reduced audit time. The controls listed

included the division of duties among employees, built-in machine totals, and greater efficiency since more proofs are required before work is considered complete. The simultaneous posting of records which are proved by machine eliminates considerable adding, test checking, and tracing of transactions. Eight firms reported machines contribute to a greater degree of accuracy resulting in more rapid audits. Five firms reported faster auditing because machines could be used for detail analyses, listings, and testing programs. Legibility was listed by five firms and neatness by four firms as factors contributing to quicker audits. Other causes listed for faster audits were better audit trails and uniform records.

Records and mechanization must be adapted to clients' operation to produce timely information. Regardless of the type of methods used, if records are current, books closed properly, promptly and accurately and statements and statistical information are available immediately, then the auditor can proceed with speed. When accounting systems do not function properly or break down, audits become very time consuming.

In conducting the audits, twenty firms indicated that the client's punched-card or electronic equipment was used. One firm used an Exact-O-Matic punched-card system to aid in auditing a manual system. To facilitate auditing, accountants are using machines. Machines and the frequency of their use

are as follows: adding machines, forty-nine; typewriters, forty-eight; calculators, forty-seven; photo copiers of various types, forty-six; multilith, twenty-three; and recorders, nine. The photo copiers included twenty-one Thermofax, two Brunning, one Recordak, and one Ozalid.

TRAINING AND SPECIALIZATION

Fourteen firms required their auditors to obtain special training in accounting machines, five required training in punched-card systems, and three required training in electronic systems. Thirty-one did not require training in accounting machines; sixteen did not require training in punched-card systems, and three did not require training in electronic systems. Three firms indicated training was required in all systems, and ten firms did not require additional training in any mechanized systems.

The manufacturer of mechanical systems assisted eight of the firms in training auditors. The training may be conducted in schools or through literature, exhibits, and conferences. Two firms conducted schools for additional training which was supplemented by on-the-job training. Some actual experience with mechanized systems is desirable but not a requirement.

One firm indicated that the audits were conducted by individuals who were specialists in all systems. Auditors of

nine firms did not specialize in any of the machines. Of thirty-nine firms, sixteen firms had auditors who were specialists in accounting machines, and twenty-three did not have accounting machine specialists. The auditors conducting audits for eight firms were specialists in punched-card systems, and three firms had specialists in electronic systems. An equal number of firms did not have specialists in either punched-card or electronic systems.

ASSISTANCE IN CONVERSION

Fifty-four of the accountants replied to the inquiry concerning the assistance given to clients in mechanical installations. Thirty-eight firms offered assistance in installation of accounting machines, fourteen offered assistance in punched-card installations, and six offered assistance in electronic equipment. Only six firms offered assistance in all types of machines. Fourteen firms did not assist the client in the installation of any mechanical equipment. Thirty-one firms did not offer aid in punched-card equipment, and thirty-seven did not assist in electronic installations.

Eleven firms assisted clients in varying degrees ranging from the complete planning and checking of installations, checking controls, checking for adequate audit trails, and planning of mechanical systems. Twenty firms assisted in planning of mechanical systems and complete planning and checking

of installations. Thirty firms checked the adequacy of audit trails and controls during the installation. Other services rendered by firms were approving forms, checking system adaptation to business operations, and advising the client which type of machine is appropriate for the requirements to be met. One firm aided in training operators and assisting supervisors to become more efficient and to understand the mechanized system. Two firms reported having service departments which assist clients in all phases of accounting. The extent of the assistance given to clients depends entirely upon needs which varies with each installation.

ADVANTAGES AND DISADVANTAGES

One firm indicated no advantages in auditing mechanized systems; however, other firms listed a number of factors which they considered to be advantageous. The factor listed by sixteen of the firms was neater and more legible machine records. Six firms attributed better records to standarized procedures and uniform information and records, which provides for an orderly pattern for flow of work and contributes to efficiency and usually results in balanced books.

Accessible information was noted by five accountants as being in more detail and better percentage comparisons can be made. Four accountants indicated an improvement in accuracy of machine records, and four firms listed speed as

an advantageous factor which permits an audit to begin at an earlier date. Other favorable factors to be considered are the stronger internal controls, current record keeping, and the reduction of detail work by the auditor. Generally, a mechanized system is better planned resulting in a better designed flow of data and stronger internal control. Under mechanical systems, information is usually more accessible; and if internal control is adequate, less audit time must be spent in reviewing detail transactions.

There appears to be no real disadvantage in auditing mechanized systems if it has been properly designed and installed. Inadequate design and installation will make the auditing of any system difficult. The largest segment of disadvantages listed by the firms was not the fault of hardware but of the operating personnel. Six accountants suggested the lack of qualified trained machine operators as a disadvantage. An inefficient operator can upset a mechanized system more easily than in a manual system. Sometimes machine errors may go unnoticed for a period of time because inexperienced persons tend to believe that the printed page is error free. Frequently, when a system is first installed the operator receives instructions; but after a change in employees, there is less instruction which results in failure to produce good work. The selling company is no longer interested in instruction but is seeking a new sale elsewhere.

Another condition aggravated by the personnel and listed by ten of the firms was the tendency for taking short cuts. These short cuts may occur in omitting balance forward figures or vital information, abbreviating references and descriptions, and offering insufficient explanations or descriptions pertaining to entries.

To alleviate part of the personnel problem, one firm suggested a more frequent use of written procedures manuals to follow in preparation of records and for use in checking consistency of machine applications.

Other factors considered as disadvantages of a mechanical system were the improperly designed systems with inadequate audit trails, and checking out machine errors were more difficult. Frequently, more time is required to trace transactions and analyses; but this is dependent upon the individual system. Corrections are more difficult to make than in a manual system which could be the result of inflexibility and machine limitations. A greater volume of physical records are frequently produced in order to arrive at desired data, thus requiring additional time to review.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The primary purpose of an audit at the present time is to report upon the financial statements issued by management. The secondary objectives of an audit are to discover errors and irregularities. This change is the result of formal business organizations and operating units large enough to employ staffs to permit internal control.

Mechanical devices have been in use for many years; however, in recent years the more complex punched-card and electronic systems have been installed. Mechanization, until recently, had not affected the work of the auditor. Generally accepted accounting principles are not altered by machine methods, nor is the necessity for external audits reduced. Audit procedures must be adapted to mechanically produced records, but the responsibilities and principles by which the auditor is governed remain the same.

Many techniques used by the auditor during the audit of manually produced records are equally effective in records produced mechanically. Accounts must be examined to determine if they represent accurately and fairly the position of the company. The verification of assets and liabilities must be made. The method of record keeping does not alter this phase of auditing.

The scope of the audit should be influenced by mechanical record keeping, since it is more reliable than records produced manually. Mechanization is a change of methods, not a change of objective or principles.

Test checking in mechanized methods, like in manual methods, is an effective audit procedure but should be considered more dependable. The number of test checks selected depends entirely upon the circumstances. In manual methods, the individual is relied upon for accuracy and efficiency; however, in mechanized systems, the human element is minimized. No machines are foolproof; yet, the machine performances are more accurate than individuals.

The evaluation of the internal control system is an inherent phase of auditing. The system should be examined to determine the position the machine department maintains in relation to the company as a whole. An internal control system properly planned separates data processing from data recording. Flow charts may be used to determine if the internal controls are functioning properly. Well designed, installed, and supervised internal controls may reduce the extent of test checking required by the auditor. Internal controls should establish that entries are accurate and properly supported.

The division of duties need not be weakened as a result of mechanization. Although employees may have more duties to perform, the knowledge of the system may be substituted for the division of duties.

The final results of mechanical and manual methods are almost the same except one is written and the other is printed. The original records and ultimate results must be correct; however, the intermediate stages are not a matter of audit principle but of mechanical detail. Some knowledge of mechanized systems and methods is helpful in conducting effective audits. Manufacturers of the mechanical devices conduct schools as a means of assisting the professional accountant to learn about the machines and systems. Other aids which can be used are the demonstrations and conferences with salesmen, literature, and the membership in a professional organization. The responsibilities of the audit engagement determine the amount of knowledge the auditor should have about the system. The auditor should not be expected to verify all built-in machine controls.

The auditor is usually not informed about the plans of a client to improve accounting methods; however, the accountant has been able to adjust his audit procedures to new systems. With the advent of electronic equipment, it appears that the auditor will be more apt to participate in the installation of new equipment. By assisting in the installation, the professional accountant may acquire knowledge about the system which will aid in following audits and assure himself that proper controls and adequate audit trails are established.

Most records, at the present, are in visible form; however, the trend is toward retaining information in punched-

cards and magnetic tapes, a result of the use of electronic equipment. The auditor must have an audit trail composed of account balances, transaction analyses, and supporting documents to conduct an adequate audit. The problem of an audit trail is shared with the professional accountant by management; therefore, many believe this problem will never be a serious one. The information required for an audit is used more frequently by management than by the auditor.

The time the audit commences has not been materially altered. Electronic equipment may cause audits to be conducted at a time close to the recording of the transaction. If the auditor plans to use the client's equipment, then advance planning is necessary.

Mechanization of accounting methods presents some advantages and disadvantages. The machines can perform with speed and accuracy, surpassing human production, which tends to eliminate many of the peak work periods and produces a neater and more legible record. The statistical data now available permits the auditor to spend his time studying and interpreting the data and eliminates much of the manual work.

A hindrance to mechanized accounting is that original documents are prepared in longhand and must be transferred to a form which machines can comprehend but is frequently difficult for the auditor to read. The mass of papers produced by mechanized methods often require more time for examination than is needed for manual methods.

Machine accuracy cannot be automatically assumed, and transactions must be checked by the internal control system. Machine operators must be properly trained in order to make the machines produce at the highest efficiency. Mechanical systems are only as good as the machine operators.

Computational and other clerical skills are primary requisites of an auditor. Through mechanization, clerical detail is reduced bring about increased production. Recorders may be used for checking various records, and the need for two people may be reduced to one. Photo copiers eliminate the copying of deeds, leases, and agreements by producing in a few seconds the desired material without error. Metered machines such as the postage machines are in widespread use to save time in mailing verifications of accounts. These machines may be supplemented with auxiliary equipment, saving more time. The adding machine can operate rapidly and accurately, and production can be expected to increase approximately five times.

During the audit engagement, the auditor should use the client's punched-card or electronic equipment. This practice allows the auditor to check the machine accuracy and produce information in a shorter period of time. Test decks may be used to check the machines which have been in operation; however, transactions selected at random from actual operations may be equally effective.

CONCLUSIONS AND RECOMMENDATIONS

The conclusions and recommendations are based on an extensive library-type research and data derived from the analysis of questionnaires returned by fifty-seven certified public accountants. It is reasonable to assume that similar firms exist in the state of Kansas. However, no claim is made that the findings and conclusions presented are applicable to any circumstances other than those immediately indicated. It is assumed that, in general terms, the results of this study constitute valid evidence of auditing practices in relation to mechanized accounting systems.

On the basis of the findings in this study, the author concludes that:

1. Mechanical methods are only a change in tools, not in objectives or principles of accounting and auditing. The objectives of either manual or mechanized record audits are to arrive at an opinion as to the fairness of the statements and to prevent error and detect fraud. The intermediate stages of record keeping are mechanical, and it is sufficient if the original records and final results are correct. If an adequate system of internal checks is in operation, the auditor may be reasonably sure the end product is satisfactory.

Assets and liabilities must be verified in mechanized systems as in manual methods.

2. The auditor should become familiar with the mechanical devices that are utilized for processing accounting data. He should be expected to relate proper audit procedures to mechanized accounting systems; however, he need not be an expert in machine operations. Frequently, auditors are not given the opportunity to assist the client in an installation or to study the equipment in use prior to an audit engagement; therefore, knowledge about the equipment is an asset to the auditor. The auditor should be required to understand the basic fundamentals and operating principles of all mechanical equipment that might be used by present or future clients. Additional training will enable the auditor to determine the adequacy of internal control, provision for audit trails and evaluation of machine controls.

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APPENDIX

1110 Market Street
Emporia, Kansas
February 27, 1959

Dear Sir:

"A Study of Effects of Mechanical Devices in Auditing" is the subject of my thesis for a Master of Science Degree at Kansas State Teachers College of Emporia.

In order to determine these effects, a questionnaire is being submitted to individuals or firms selected from the Register of Persons and Firms Entitled to Practice as Certified Public Accountants, published by the Board of Accountancy. Only one questionnaire is being sent to each firm. It is expected that the data gathered in this study will indicate the trends and changes in the work of the auditor due to mechanical devices. Manually operated machines, as well as punch-card equipment and electronic installations, are included in the mechanical devices under study.

Two copies of the questionnaire are enclosed, one to be retained for your files and the other to be returned. A self-addressed envelope is enclosed for your convenience in making a prompt return of the questionnaire.

Very truly yours,

Joan Wacek

Joan Wacek

1110 Market Street
Emporia, Kansas
April 15, 1959

Dear Sir:

To obtain information for "A Study of Effects of Mechanical Devices in Accounting on Auditing," my thesis subject, a questionnaire was sent to you recently.

It is expected that the data gathered in this study will indicate the trends and changes in the work of the auditor due to mechanical devices; therefore, the information you are able to provide about your firm is important to make this study complete. Would you please complete the questionnaire so that I may include your information in my study?

Another set of the forms and a postage-free, self-addressed envelope is enclosed for your convenience in making a prompt reply. Would you please return the questionnaire by April 25, 1959?

Very truly yours,

Joan Wacek

Encl. 2

1110 Market Street
Emporia, Kansas
May 4, 1959

Dear Sir:

If your work schedule permits, there is still time to return the information requested for the study of effects of mechanical devices used in accounting on the auditor's work. I realize this study was started at an inopportune time, during the tax period which is a very busy season for accountants.

Since you were selected from the Certified Public Accountants entitled to practice in Kansas, I would like to include the information you can provide about auditing accounting records produced by mechanical devices. This study can be complete and representative of the professional accountants of Kansas only by obtaining the information from every member including you.

Will you please complete and return the questionnaire by May 15, 1959? Another set of forms and a postage free, self-addressed envelope is enclosed for your convenience.

Very truly yours,

Joan Wacek

Encl. 2

A STUDY OF EFFECTS OF MECHANICAL DEVICES ON AUDITING

Please complete this form and return to: Joan Wacek, 1110 Market Street, Emporia, Kansas. A self-addressed, postage-free envelope is enclosed for your convenience. ALL REPLIES WILL BE GIVEN CONFIDENTIAL TREATMENT.

Name_____ Firm_____

Title_____ City and State_____

DIRECTIONS: Please complete the following questions. Some of the questions may be answered by making a check in the appropriate space. However, space is provided for any comments you wish to add. In this study, "accounting machines" refers to National Cash Register's Class 31, Burroughs Sensimatic, and other similar models.

1. Does your firm audit specialized accounts? Yes_____ No_____
   If "yes," do you specialize in any of the following:

Retail accounts	Yes_____	No_____
Wholesale accounts	Yes_____	No_____
Manufacturing accounts	Yes_____	No_____
Governmental accounts	Yes_____	No_____
Service accounts	Yes_____	No_____
Banking and Finance accounts	Yes_____	No_____
Other accounts	Yes_____	No_____

   If "other," please list.

2. What per cent of client's records audited by your firm use the following:

"Pen and ink" method of record keeping	_____%
Accounting machines	_____%
Punched-card equipment	_____%
Electronic equipment	_____%

3. Does your firm assist clients in the installation of the following:

Accounting machines	Yes_____	No_____
Punched-card equipment	Yes_____	No_____
Electronic equipment	Yes_____	No_____

4. If your firm assists clients in the installation of accounting machines, punched-card equipment, or electronic machines, check the procedures in which your firm participates.

Complete planning and checking of installations	_____
Planning of mechanical systems	_____
Checking controls during the installation	_____
Checking for adequate "audit trails"	_____
Other. Please list.	

5. In auditing accounting records produced by accounting machines, can a significant amount of time be saved in comparing the audit time required for manually produced records? Yes____ No____ If "yes," what per cent of time is saved? _____%

6. In auditing accounting records produced by punched-card equipment, can a significant amount of time be saved in comparing the audit time required for manually produced records? Yes____ No____ If "yes," what per cent of time is saved? _____%

7. In auditing records produced by electronic equipment, can a significant amount of time be saved by comparing the audit time required for manually produced records? Yes____ No____ If "yes," what per cent of time is saved? _____%

8. If audits of mechanized accounting records can be made faster, what are the reasons?

9. Must the audits commence at a time close to the end of the fiscal period for the following:

Accounting machines	Yes____	No____
Punched-card equipment	Yes____	No____
Electronic equipment	Yes____	No____

If "no," when do the audits commence?

10. Are the audits conducted by individuals who are specialists in the following:

Accounting machine systems	Yes____	No____
Punched-card systems	Yes____	No____
Electronic systems	Yes____	No____

11. Does your firm require auditors of mechanized systems to obtain special training in any of the following:

Accounting machine systems	Yes____	No____
Punched-card systems	Yes____	No____
Electronic systems	Yes____	No____

If "yes," what type of training do the individuals receive?

12. What should the auditor know about accounting machines, punched-card equipment, or electronic machines in order to make an effective audit?

13. Are adequate "audit trails" established at the time of machine installations?
Yes_____ No_____ If "no," when are the "audit trails" established?

14. Is the machine accuracy checked during every audit? Yes_____ No_____
If "no," how frequently are the machines checked?

15. Are test decks used in checking punched-card and electronic machines?
Yes_____ No_____ What other methods are used to check the machine accuracy?

16. Indicate by checking in which system internal control is more important.

Manually kept records_____ or Accounting machine records_____
Manually kept records_____ or Punched-card records_____
Manually kept records_____ or Electronic records_____

17. In conducting audits of punched-card or electronic records whose punched-card or electronic equipment do you use?

Client's equipment	Yes_____ No_____
Your equipment	Yes_____ No_____
Other	Yes_____ No_____

If "other," please indicate.

18. Which of the following mechanical devices do you use in conducting an audit? Please indicate by checking:

Typewriter_____	Adding machines_____
Calculator_____	Postage machine_____
Dictaphone_____	Photo copiers_____
Multilith_____	Thermofax _____

Other_____ Please list.

19. To what extent can tests of representative transactions and examinations of selected portions of certain accounts be relied upon for establishing validity and authenticity of the transactions for the following:

    Accounting machine systems?

    Punched-card systems?

    Electronic systems?

20. What changes have you found in audit procedures for auditing mechanized records?

21. What are the advantages of auditing mechanized systems?

22. What are the disadvantages of auditing mechanized systems?

23. Do you have a pre-determined procedures plan for auditing mechanized records? Yes_____ No_____ If "yes," what are the procedures?