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Katherine West spent thirteen years as an internal accountant for a manufacturing company before she joined, simultaneously, the staff of Haskins & Sells and the faculty of Brooklyn College, where she teaches accounting two nights a week.

While studying evenings at Hunter she abandoned her first intention of specializing in mathematics and switched to an accounting major. After Hunter College had bestowed an A.B. (cum laude) upon her, she pursued graduate work in accounting and auditing at Columbia, where she obtained an M.S. in 1946.

The accompanying article on the difficult subject of mechanized accounting is a condensation of the thesis on which her master's degree was granted.

Miss West is a member of the New York Chapter ASWA and chairman of its Committee on Education.

MECHANIZED ACCOUNTING

By Katherine M. West

Just as machines solved industry's need for greater production, mechanical devices are employed on a wider scale from day to day to prepare the necessary paper work for the modern business. The designation of certain mechanical devices as "auditing machines" has resulted in some misunderstanding regarding the work they produce. Some persons have visualized the machine as a form of equipment into one end of which figures are fed to reappear at the other end in the form of a finished statement. This is far from the truth; for the so-called "auditing machines" are scarcely more than statistical and registering apparatus. The name "auditing" applies only to the machine's capacity to furnish an internal check upon the transactions analyzed.

Irrespective of whether the books are kept by hand or machine methods, the examination of the accounting system in force is the first step in every audit. It is only after the auditor has made such a preliminary investigation that he can plan his audit program for the particular engagement. Before he begins his work, he must ascertain how the machines are used, the nature and quality of the work performed, and to what extent this machine-produced work is proof against error. It is still a matter of individual judgment how strong the evidence should be and at what point the auditor should feel satisfied.

There are two major systems of mechanized accounting, those in which posting machines predominate and others which employ the more recently devised punched card equipment.

In reviewing an accounting system in which posting machines are employed, the auditor should become familiar with the two most outstanding features of the work, the prelisting and the proof sheet. The first involves the use of an adding device to itemize the media before posting. The proof sheet, prepared simultaneously with the individual records, is a summary which shows the detail of each recorded transaction and the total of all items posted during the entire "run".

Originally devised for census compilations, the punched card system has been adapted to other statistical and accounting work and has been satisfactorily adopted by various business concerns in which the increasing volume of paper work persisted as a principal problem.

Under this mechanical system, the operator records the particular facts or data required by punching holes in the symbols on the cards. These cards are then placed in a sorting machine, which picks up the cards according to the holes, deposits them in a sectioned receptacle, and accumulates totals of each classification, all in one operation. Then these sorted cards may be run

through a tabulating machine to print the details and the totals of each classification on a sheet of paper. By repeating this operation for each type of information desired, all the facts indicated by the punched cards may be analyzed and totaled. One of the outstanding features of the system is the summary card that can be punched to record the total of the information contained on a large number of cards which may then be retired to storage.

Does the auditor err in depending upon the results of a tabulation by machine? What errors are probable? Errors can enter only by the occasional punching of a hole in the wrong position on a card, skipping a column, or putting a second hole in a column where there should be only one. These errors arise chiefly because the operator is unable either to read the data or to transcribe it properly.

Since the punched card is a tool of mechanical accounting and serves as the basis for all future tabulations, it is of vital importance that the proper holes be entered on it. In fact, there is only one stage of the punched card accounting system susceptible to human error; this is the punching of the original card. At the outset, therefore, the auditor must satisfy himself as to the accuracy of the card. Once the original card is punched and verified, the only other possible source of error is a mechanical breakdown. If the cards are correct, the information recorded on them may be tabulated and retabulated with the assurance at all times that the results obtained are mechanically correct.

The auditor must bear in mind that any effort he expends to examine the individual punched card and to put a check on it is wasted. The punched card serves, not as a document of audit but fundamentally as a part of the mechanism, a writing device like a pen or a pencil. His attention must necessarily turn to two things: the original document and the corresponding entry which a punched card has caused to appear on the books. The system should be so planned that it is simple for an auditor to trace an item on a tabulation direct to the document from which such entry came.

Even though it is commonly acknowledged that the degree of machine accuracy is higher than that of clerks, the auditor should spot-check a few additions and apply a bulk check whenever it is advisable to build up an independent control account. Spot-checking can be carried out very simply through the use of the automatic sort-

ing operation to segregate the detail cards for the specific classification to be sought. Because a given set of data is repeatedly analyzed in many different forms to satisfy statistical requirements, as well as the demands of the bookkeeping systems, it is difficult for a person to manipulate results either to defraud or cover up incorrect work. The psychological effect of this factor cannot be overlooked.

There is a noted tendency under this system for details to be retained on the forms provided by the machines and for bound books, where they are kept, to contain the totals. Before he can begin his work, the auditor must be certain that all basic accounting media are available, that he has a correct key to the code, and that the test cards punched before each "run" can be procured.

The necessary precautions to be taken in auditing punched card records are:

1. To note that the original documents reached the operators of the machines and that the punched cards were verified before being dealt with further.

2. To compare the tabulations with the listings compiled on an adding machine by a person other than the accounting machine operator.

3. Where no separate detailed tabulated list exists, to compare the information shown on the punched card with that on the original document. This the auditor may do by test-checking, either running the cards through the machine himself or having an operator do so under his supervision.

4. To investigate punched card removals or substitutions. There seems to be little risk of the latter under this system because of the operations involved.

The loss of a card is of no major importance. By reference to the tabulated sheets a cross reference to the source document is found; and inasmuch as this document—not the card—is the main consideration it makes little difference. If the card is lost before the preparation of the tabulated sheet, it is immediately discovered, because the detail cannot agree with the control figure.

To provide a proof on any work, that work must be repeated, either by physical duplication or visual comparison. Both are used in the routine of most offices; in mechanized accounting systems, duplication is almost always preferred. These duplicate records often assist the auditor. As an example, he ordinarily desires to include

in the scope of his audit program a detailed test check of a few individual customers' accounts; this he may accomplish by referring to the carbon copies of the actual statements sent to the customers.

It cannot be maintained that machines are foolproof to human error and manipulation. Machines are designed to prevent clerical error rather than fraud. While mechanization has exceedingly reduced the human factor in accounting, it has not eliminated it. It has even introduced new factors in which the human element may err both unintentionally and by design.

The auditor's responsibility in carrying out the duties of his profession requires that he make himself conversant with the principles of mechanization. This requirement should not cause an independent auditor any pronounced despair, for one who has mastered the fundamental principles of pen accounting is not confronted with any decided obstacle in bringing those same principles into relation with machine accounting. There is no apparent reason for him to plan on acquiring the operational skill of the specialized worker, but he ought to gain a clear understanding of the various types of office machines, the way these appliances work, the function of mechanical appliances in general, the principles of mechanization as applied to accounting, the failings of the machines—inherent and due to application, the extent to which he can rely on records produced mechanically, and the degree of assistance rendered in the prevention and detection of fraud.

As in the hand written system of double entry bookkeeping, there are three major operations in mechanical accounting. These consist of journalizing, posting, and balancing. Though the fundamentals of both systems are the same, the methods of deriving the results differ. Under the mechanical system, journalizing takes the form of listing on the adding machine, posting is part of the machine tabulation process, and balancing the work is merely a formal comparison of machine-produced balances with predetermined tape totals.

The nature of the original documents used in both systems is the same, and in general this similarity carries over to the method of checking and controlling the paper work. The listing on the adding machine, however, furnishes insufficient detail for complete accounting records, and consequently a good filing system is an absolute necessity. There must be in force

a satisfactory method of linking the documents with the journal and the ledger postings.

The auditor's examination is facilitated if the system of cross references and tabulations is complete. Some systems are so condensed and sketchy that a proper audit cannot be made in reasonable time. In many firms, almost all information is coded and the auditor may deem it necessary to require tabulations to be inserted on documents produced to him for audit. Since he may not be in a position to make readily detailed investigations and since he is given numerous summary entries, the system of internal control is of great importance to him. It is therefore absolutely necessary that the system be such that any unintentional mistakes made will be brought to light in daily operations by internal checking and reconciliation.

Some auditors may be reluctant to accept the totals shown as summations of the figures typed on the tabulated sheets. The makers of the equipment claim that the mechanism is almost error-proof, but it is doubtful that the conscientious auditor will trust these figures implicitly. He can test-check a few of the totals by adding up the detail figures or he can ascertain if there is a separate independent check of these totals in another direction. The adequacy of the internal control system will determine the extent to which additions can be accepted.

The particular firm's method of adapting the machines to the work program should offer no problem to the auditor. He can trace selected transactions from origin to final disposition and thus acquaint himself with the recording procedure. It will be found that no matter how much the firm's system is like all other standardized mechanical systems, there are many exceptions which must be noted and provided for. In addition, he should obtain a certificate from a reliable person as to all he wants to know about the functioning of the machines and the maintenance and repair program followed.

By rendering considerable aid in maintaining bookkeeping records on a current basis, the mechanized system has proved a timely innovation in this age when management desires daily operational figures.

There has been taking place a gradual shift from detailed auditing to a skilled program of test and analysis. Under this system, the auditor may devote less time to arithmetical accuracy and more to the authenticity of the entries.