1963

# Auditing automatic source recording

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## *A case study*

*An employee identification badge and prepunched labor card being inserted into IBM 357 "transactor" source recording device for labor accounting.*


Electronic data processing concepts have advanced so much that, if put into practice, they might make conventional auditing of automatic source recording physically impossible. Several writers on the subject have predicted that the conventional auditing techniques can be adapted to the EDP systems in current use as well as those of the future. These adaptations lean heavily on maintaining audit trails and getting readable input and output data.

But a recent case study of an automatic time clock system in a large industrial plant shows the need for a use of a fresh auditing approach. It solves the problem by emphasizing testing of procedures and controls rather than transactions. It appears to be a valid method for application to the "complete" business systems expected to be common in the future.

Before highlighting the case study, we will define the "complete" business systems as being on-the-line-real-time, translating business transactions when they physically take place. They have no audit trails. Input documents are unconventional, almost eliminated. Output information emerges in summary, not detail.

Steps toward the on-the-line-real-time systems taken now by many businesses involve use of either computer systems or semi-mechanized systems such as automatic source recording devices. Examples of such devices are time clocks, the subject of our study, point-of-sale recorders for retailers, the airlines' automatic reservations and ticketing networks.

In our case, the situation confronting the auditors was an automatic time clock system which records labor transactions in a major plant of a large manufacturer. Automatic time recording devices (IBM 357 "Transactors") are located throughout the shop areas. For the 11,600 employees covered by this system, these devices have

completely replaced the human timekeepers and manually-prepared time cards.

Data from the system flows through to the company's payroll and job order cost accounting and control records. Basic timekeeping tools are: (1) the plastic employee badge, prepunched with identifying information, and (2) the job card, prepunched with the charge number and other information about a particular job.

The badges are permanently assigned to each employee. The job cards follow the parts or assemblies to be worked on. Exceptions are indirect labor and other special cards, which are located in racks adjacent to the Transactors. Clock-in on reporting for work requires only insertion of the badge into the Transactor, and depression of certain keys. Check-in on a job requires insertion of the badge and one or more job cards, and depression of other keys.

All Transactors are linked electronically to a central control box (IBM 358), a master clock, and an in-line key punch which creates a punched card for each entry. The cards are converted to magnetic tape for passing through computer processes on IBM 1400 Series equipment. The first of these, a match against an employee identification master tape, begins one-half hour after the beginning of each shift.

Within an hour after shift start, an exception report has been prepared for distribution to shop foremen. This report indicates absences, tardy clock-in, preshift overtime, and failure to check in on a job. Each exception must be approved by the shop foreman. Transactions accepted in this first processing routine plus transactions accepted for the remainder of the shift are "posted" to a 1410 random access file arranged by employee. Transactions rejected must be analyzed and corrected for re-entry into the processing cycle.

All labor transactions for the day are read out onto another magnetic tape which goes through a series of further computer processes:

(1) Preparation of final daily report to shop foremen. Again prepared for exceptions only, this shows overtime, early clock-out, and other items for approval by foremen.

(2) Daily report which balances job time by employee with time between clock-in and clock-out.

(3) Daily labor tape prepared after (2).

(4) Matching of job transactions against a random access file of job numbers. This processing involves application of labor standards on certain jobs, accumulation of time by classification, and preparation of output tapes for numerous reports. These include daily reports of actual and budgeted time to certain shops, summary management reports by type of labor, and job status reports.

(5) Entry of the daily labor tape from (3) above into another computer (IBM 7080) for the payroll process. At this point the labor hour transactions are "priced" by application of pay rates. The labor is accumulated by employee for bi-weekly payroll processing and by job for weekly accounting distribution reports.

In pre-EDP days, an auditor was able to begin with either a payroll report or a labor distribution report and to trace individual time charges back through the system to underlying time cards or other source documents. This is obviously impossible when the labor transaction is initiated mechanically.

The auditors decided that their review of labor charges would consist of two phases:

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1. Observance of actual labor charges being initiated, with subsequent tracing of these transactions through to final reports.

2. Test of the system itself in normal operations, by use of dummy but realistic transactions designed to test not only the routine processing but also the various exception editing and rejection procedures.

It was also decided that the second of these phases should receive greater emphasis because it enables many facets of the operation to be tested with only a small number of transactions. An alternate approach would be for the auditor to make a detailed examination of the computer program instructions. However, this would involve a massive translation and interpretation of many thousands of coded individual program instructions.

Consequently, the auditors decided upon the dummy transaction method as equally acceptable but easier than the alternate approach. Steps they followed in using the dummy transaction method included:

1. A thorough review of system and computer program flow charts was made.

2. Inquiry was made of responsible persons as to the various control points designed into the system.

3. Based on the system review, a set of situations was prearranged. These situations were designed to test many of the control points said to exist in the system. Several examples of these situations were:

(a) Employee clocks in on time, works normally for full shift.

(b) Employee checks in on job without clocking in.

(c) Employee clocks in but fails to record a job transaction.

(d) Employee is absent.

(e) Employee is tardy.

(f) Employee is tardy but within three-minute "grace period" allowed.

(g) Employee leaves before shift ends.

(h) Employee leaves early but returns.

(i) Night shift employee clocks in on day shift.

(j) Employee works overtime into next shift.

(k) Employee is loaned to a different shop.

(l) Employee charges jobs improperly (e.g. direct as indirect time).

PROGRAM 03621 — MACCS LABOR BALANCE REGISTER — 702-070

| BUDGET LOAN | SHIFT | EIN PROCESS | S.S.N. STAT | FWC | EMPLOYEE NAME CC W.C. SUB SERIAL | OPN RES | CT CD | TIME | HOURS REG | BUN | DATE MO-DY-YR | L/B CARD COUNT | JOB COUNT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-9251 | 1 | 159970 | 202-28-0826 | | MCLEAN GARY | | | 09.47 | 7.0 | | 10-31-62 | | |
| 2-6251 | 1 | 037247Y | 55 | 1331 | 1-67232-1027-233787 | 7 | | 11.45 | 2.0 | | | | |
| 2-1860 | 1 | 1309174 | 55 | 0000 | 8-25334-186C-000000 | 000 | | 17.02 | 5.0 | | | 2 | 2 |
| 2-9251 | 2 | 159978 | 541-30-2792 | | MCLEAN GARY | | | 17.88 | | | 10-31-62 | | |
| 2-9251 | 2 | 159979 | 536-28-6570 | | MCLEAN CARY | | | | | | 10-31-62 | ABSENT | |
| 2-9251 | 1 | 159972 | 535-24-7310 | | MCLEAN GARY | | | 08.5 | 8.0 | | 10-31-62 | | |
| 2-9251 | 1 | 1309013 | 55 | 0000 | 1-72823-0940-029251 | 000 | | 10.93 | 2.4 | | | | |
| 2-9251 | 1 | 044859W | 55 | 1341 | 1-69591-122C-226050 | 3 | | 13.65 | .7 | | | | |
| 2-9251 | 1 | 012614Z | 55 | 1341 | 2-78800-0406-507968 | 675 | | 13.85 | .5 | | | | |
| 2-9251 | 1 | 003865L | 55 | 1341 | 1-72141-0322-072000 | 000 | | 13.65 | .2 | | | | |
| 2-9251 | 1 | 003865L | 55 | 1341 | 1-72141-0322-071000 | 000 | | 13.65 | .3 | | | | |
| 2-9251 | 1 | 003865L | 55 | 1341 | 1-72141-0322-072000 | 000 | | 13.85 | .2 | | | | |
| 2-9251 | 1 | 003865L | 55 | 1341 | 1-72141-0322-071000 | 000 | | 13.85 | .3 | | | | |
| 2-9251 | 1 | 1034364 | 55 | 1341 | 1-78900-0201-379106 | 152 | | 13.85 | .3 | | | | |
| 2-9251 | 1 | 136933U | 55 | 4652 | 1-78103-056C-064007 | 014 | | 17.02 | 2.9 | | | | |
| 2-9251 | 1 | 136933U | 55 | 4652 | | | | | | | | | |
| 2-9251 | 1 | 159971 | 518-30-7674 | | | | | | | | | | |
| 2-9251 | 1 | 092566X | 55 | 1323 | | | | | | | | | |
| 2-9251 | 1 | 092566X | 55 | 1323 | | | | | | | | | |
| 2-9251 | 1 | 1309013 | 55 | 0000 | | | | | | | | | |
| 2-9251 | 1 | 1309013 | 55 | 0000 | | | | | | | | | |
| 2-9251 | 2 | 159977 | 513-20-9504 | | | | | | | | | | |
| 2-9251 | 2 | 0999566 | | | | | | | | | | | |

# GATE REPORT

FIRST SHIFT — SUMMARY — OCT 31, 1962

G GRACE PERIOD G
T TARDY
R RETURN
EARLY LEAVE E
N - NO - N
Y YES

A - Absent
AP - Away but Paid
E - Early Leave
F - Failure to Punch
H - Hospital, Industrial Accident
JD - Jury Duty
LOA - Leave of Absence
NH - New Hire
SC - Shift Change
T - Tardy
TB - Temporary Badge Used
TI - Transferred In
TO - Transferred Out
V - Vacation

| SHIFT | BUDGET ORG'N | STA. | EIN | EMPLOYEE NAME | SOCIAL SECURITY NO. | NORMAL SHIFT HRS. | ACTUAL TIME START | ACTUAL TIME STOP | HOURS PAID REG. | HOURS PAID O.T. | CLOCK IN | JOB CHECK IN | POST SHIFT O.T. PREMIUM O.T. | POST SHIFT O.T. HOURS TO BE PAID BY KEYBOARD | O.T. LUNCH | LUNCH | CLOCK OUT | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CLOCK | | | | | | | | | | | | | |
| 1 | 2-9251 | 55 | 599706 | MCLEAN GARY | 202 28 0826 | 085 | 0947 | 1702 | 7.0 | | T | | | | | | | LOAN TO 2-9251 |
| 1 | 2-9251 | 55 | 599714 | MCLEAN GARY | 518 30 7674 | 085 | 0827 | 178 | 8.0 | 00.8 | | | | 0.8 | 9 | | | LOAN TO 2-9251 |
| 1 | 2-9251 | 55 | 599720 | MCLEAN GARY | 535 24 7310 | 085 | 085 | 1702 | 8.0 | | N | | | | | | | |

DATE

AUTHORIZED SIGNATURE

*The auditor's name and dummy numbers appeared on reports produced by the daily data processing cycle. Above is segment of daily labor balance report. Below is final daily gate report indicating exception transactions to shop foremen.*

(m) Employee uses transactor keys improperly when checking in on job.

4. The necessary timekeeping documents were then arranged for and pre-set into the system. Since the auditors desired to perform the test under normal operating conditions, using actual shop locations and job cards, the only dummy items necessary were a group of employee badges. With one exception used for test purposes, the employee information was entered into the master records to agree with the badges. (Similar entry was not made into the payroll master records in order that no paychecks would result. However, it would be possible to carry such a test through the payroll portion of the system.)

5. Using the situations outlined above, and a prearranged time schedule, the test was carried out in two shops during normal working hours. Both day and night shifts were used.

6. Data processing supervisors were made aware of the general nature of the test but not of the specific types of transactions being tested. Shop foremen were not informed until after they had questioned the dummy transactions which appeared as exceptions on attendance reports.

7. All transactions (42 in number) were traced through to reports which emerged from the data processing system on the same and following day. These included preliminary and final attendance exception reports, exception reports of erroneous job transactions, and the daily balance report of proper job and attendance transactions.

8. During the test, observation was made of several employees initiating job transactions. These were likewise traced to daily reports.

9. The auditors utilized the inquiry features of the data processing system to read out sections of the records and determine that the test items were being handled under normal conditions.

The results of the test proved highly satisfactory. The auditors identified, with two exceptions, every dummy transaction as being processed properly, and concluded that the system was generally functioning as it had been outlined. Two system discrepancies were noted.

Extended tests on a subsequent day were made in an effort to determine the reasons for these two discrepancies. The extended tests confirmed the errors and brought about an investigation which disclosed the reasons.

The first discrepancy resulted in the rejection of certain seemingly proper transactions as exceptions. This happened because the manufacturer had previously made a change in "leave early" cards but had failed to collect all the superseded cards from the rack placed in the shop.

The second discrepancy was rather unusual and brought to light a computer programming error. The program instructions said, in effect, "If the next to last employee in the processing cycle is an exception, do not process the last employee." Since the dummy employee numbers used by the auditors were the last on the employee list, this program instruction went into effect and the last item failed to process.

Although the procedures were not designed to test the payroll portion of the system, the auditors did note that all time accumulated for the dummy employees was rejected when the data reached the payroll cycle. This provided assurance that paychecks could be processed only for employees having payroll master records as well as master records in the timekeeping system. Because the files and EDP equipment are physically and organizationally separated, payroll padding would require a considerable amount of collusion.

It should be mentioned here that the audit program for this manufacturer also includes tests which begin at the other end of the payroll cycle—the accounting records. The procedures include reconciling payrolls paid with distributed labor, tracing labor distribution from accounting entries to weekly and daily reports, and the normal testing of employees' payroll records and paychecks. It is felt that the system test of labor collection outlined above provides the auditors with a complete check on the labor system from the point of origin through to the general ledger.

Members of the manufacturer's management responsible for this phase of operations were extremely cooperative in assisting the auditors, and, in fact, welcomed the independent test of computer programs. While the programs were tested thoroughly during their design and implementation phases, this was the first test of the system in actual operation. The responsible persons were particularly interested in the system discrepancies disclosed, and took immediate corrective action.

This auditing project was in many ways experimental. Its success and in particular its comparative ease of performance were gratifying indeed. The number of unusual conditions which were tested with a few simple prearranged plans would have required thousands upon thousands of transaction selections had random sampling or any other conventional testing process been used.

The power of a fresh approach to the problem combined with the effective use of the computer in focusing on controls and exceptions is tremendous. By using his ingenuity and making the computer his tool, the auditor can meet the challenge of the future: maintaining his historically high standard of professional competence.