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Utilizing the computer in auditing, a case study

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A Case Study

Utilizing the Computer in Auditing

The authors wish to express their appreciation to Firth Sterling Inc., for their cooperation in preparing this article.

by Walter T. Porter and Joseph F. DiMario

Joseph F. DiMario   Walter T. Porter

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He is a member of the AICPA, AAA, NAA and Beta Gamma Sigma. He has taught accounting, auditing and statistics at Columbia. He is married and has two children.

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He is an associate director of the NAA, Treasurer of TIMS and is active in the Jaycees and other civic groups. He is married and has a four year old daughter.

Articles written about auditing and electronic data processing in recent years[1] indicate that the auditor is going to have to revolutionize his audit approach because of the changed nature of the audit trail. There is no question that changes will have to be made by those who audit "through the computer" rather than "around the computer." Before attempting to use the computer as an audit tool, however, the auditor should be well aware of the problems which will confront him. The purpose of this article is to present some of the problems encountered in using the computer in auditing and to indicate the results obtained from such an approach. The empirical evidence comes from work performed by an Audit-EDP team[2] in the area of accounts receivable, including order entry, invoicing, and cash receipts, at FIRTH STERLING Inc., a Pittsburgh Office client selected for case study work as part of the Audit-EDP Study Project.

Summary of System

FIRTH STERLING, a specialty steel manufacturer, with a sales volume of approximately $35,000,000, processes accounting and operational data on an IBM 1401 Data Processing System. The Company converted its data processing from a punched card unit record system to a computer in July — starting with order entry, invoicing, and accounts receivable updating.

The planning of this conversion began in January, 1962, and was based upon recommendations incorporated in a feasibility study performed by T. R. B. & S. During the planning period, we met periodically with the client personnel to aid them in systems design and to provide management with an appraisal of progress.

The system includes a teletypwriter order entry network, a 1011 paper tape reader, four 7330 magnetic tape units, a 1402 card-read punch and a 1403 printer. The central processing unit is a 1401 with storage capacity of 12,000 alphamerical characters of 8-bit core storage.

All orders are transmitted to the Home Office in Pittsburgh over the teletypewriter system and a paper tape is prepared at Pittsburgh for the orders received in addition to a seven-part sales order form. The paper tape is read

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[1] For an excellent survey of the subject, see "Impact of EDP on Auditing," by Gregory Boni in *The Journal of Accountancy,* September 1963.

[2] This team consisted of Henry J. Rossi and Joseph F. DiMario of the Pittsburgh Office and Walter T. Porter, Jr., a member of the firm's Audit-EDP Study Project team. William G. Johnson of the New York Office assisted in the development of computer audit programs. Dennis E. Mulvihill, Manager — Computer Systems and also a member of the Audit-EDP Study Project team, gave excellent guidance during the planning stages of the case study.

into the 1401 computer, using the paper tape reader. The computer program performs certain validity checks on the incoming orders and writes a magnetic tape for all valid orders. The orders on this tape, after being sorted in order number sequence, are processed by the computer to generate a printed Daily Orders Entered Register, an updated open order magnetic tape, an inventory control tape, punched cards for the day's orders, and other punched card output for the preparation of printed reports.

The open order magnetic tape is processed by the computer, with punched cards for orders shipped, to prepare invoices and punched cards for the day's billings.

The billing and order cards, together with punched cards for cash receipts, credits, and other activity affecting the accounts receivable, are processed by the computer to update the accounts receivable magnetic tapes and to prepare a daily sales-cash receipts journal which also includes the daily cash deposit slip.

Trade accounts receivable average approximately $2,500,000 and consist of over 4,000 accounts of which approximately 5% of the accounts represent about 80% of the total dollar value.

The accounts receivable are on two magnetic tapes. One is the Basic Record tape which contains 523 characters of data including customer number; name and address; account balance; amount on order by product line; credit limit; and credit, delinquency and sales history. The other magnetic tape is the Item Record and contains the details supporting the Basic Record account balance. These tapes are retained for three days before being written over. The date on which the tape can be written again is placed on the tape header label and an error message is printed on the printer, in accordance with the computer program, if the tape is used prior to the "Write" date. The auditor who wishes to use the computer must be cognizant of the client's retention cycle so that information in computer-readable form is not destroyed before the auditor processes it or creates an auditor's tape.

At month-end, the accounts receivable magnetic tapes are processed to print the aged trial balance and the monthly statements for customers desiring statements.

Auditing Objectives and Techniques

The objectives of our audit work were:

1. To evaluate the client's system of internal control, including the design of appropriate tests.
2. To determine the validity of the client's year-end accounts receivable amount and to evaluate the collectibility of the accounts.

Evaluation Procedures

We evaluated the system of internal control by using the techniques of observation, inquiry, and review of documentation. Our review of the client's documentation included a review of existing manuals narratively describing the computer system and procedures, a review of computer flow charts and detailed block diagrams, and a review of source documents and the layout of the punched card and magnetic tape input and output. The tests we designed, in many respects, differ from those used in the past. Conventionally, the auditor has selected actual accounting transactions that have been previously processed by the client. The client's system design emphasizes "total" management information rather than only financial information. Such a system alters the audit trial; thus, our tests must differ from those traditionally employed.[3] Some of these tests require computer audit programs. Others require the creation of dummy but realistic transactions designed to test not only the routine processing but also the computer program controls and exception reporting. Most of our new tests are more operation-oriented than the tests used in prior years.

A good example of this changed concept is our testing of the order entry process. This process generates output, in computer-readable form, for inventory control, invoicing, backlog reporting, and credit limit checking. The objectives of our tests and the procedures used are:

Objective — To determine that all orders transmitted by the branches get processed properly on the open order file and that the client's computer program controls exist.

Tests —

1. Transmit a valid order to be shipped "as soon as possible" and trace it to the orders entered register.
2. Transmit a valid order to be shipped "as soon as possible" and make a change in the quantity ordered on the following day. Determine that the change appears on the change order register and that the open order file reflects the change. To determine that the open order file is changed, process an inquiry card with the client's search computer program along with the magnetic tape open order file.
3. Transmit the following incorrect orders and determine how they are processed:
    a. An order that has inconsistent information in related fields.

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[3] For a review of audit work performed in an On-Line, Real-Time system, see "Auditing Automatic Source Recording," by Robert Benjamin in *The Quarterly*, September 1963.

b. An order that has an improper discount.

c. An order that is improperly priced.

d. An order that has an order number with more characters than permitted in the magnetic tape layout. (An overflow condition)

Objective — To determine that the open order file is reviewed periodically for unusual items.

Tests —

1. Transmit a valid order and destroy the shipping copy of the sales order;

2. For a selected day in the test month, process the client's open order magnetic tape using our computer program ART-I which tests all orders for:

   a. Improper cash discounts.

   b. Consistent pricing for selected stock items.

   c. Inconsistent data in related fields.

   d. Stock items not shipped 15 days from order date.

   e. Production items not shipped 30 days from order date.

   f. All items back ordered.

3. Obtain satisfactory explanation from the client for all exceptions resulting from the above tests.

Year-end Procedures

In the past, year-end work has included:

1. Confirming approximately 80% of the dollar amount of the accounts receivable by selecting, for positive confirmation, all accounts with balances in excess of $5,000 and by randomly selecting, for negative confirmation, 10% of all accounts with balances less than $5,000.

2. Footing the client's aged trial balance and checking the aging of the accounts in the trial balance.

3. Reviewing sales and shipping records and credit memorandums for a period subsequent to year-end to determine whether such transactions have been recorded in the proper accounting period.

4. Examining credit files, contracts, correspondence, etc., on all major accounts and overdue accounts to evaluate their collectibility.

All of the above procedures were performed manually by the audit staff in prior years. This year, the audit manager decided to use, to the extent possible, the computer in the year-end work. The use of the computer involved a review of the client's Accounts Receivable magnetic tape layout to determine what information was available in computer-readable form. We found that, because of the information available in the magnetic tapes, certain audit work could be performed this year which we were unable

to do last year because the information either was not available last year or was available in such a form that it was impractical to evaluate. Once the tape layout was reviewed and the audit procedures formulated, we developed computer audit programs. The development of the computer audit programs for year-end work is discussed in a later section of this article.

Problems

In performing the audit work, we encountered problems which can be associated with three factors:

1. Conversion.

2. Time.

3. Technology requirements.

Conversion

The conversion process will not always be taking place at the time of audit work at companies with computer installations. But, with the increasing number of conversions and the time required for a conversion, the probabilities of the auditor encountering a conversion are rather great. As you can well understand, conversion is a trying period — a period where EDP personnel and others affected by a changing system are under real, and sometimes magnified, pressures of time and management demands. Because of these pressures, plans for documentation and the converting of historic information to master tapes are brushed aside.

From an auditor's viewpoint, five problems can be related to the conversion:

1. Complete documentation on certain phases of the system is not available. FIRTH STERLING'S systems and procedures manual included only a narrative description of the order entry process. The Company plans to document the other computer processing areas, but conversion problems have been too great to permit this.

2. Some of the existing documentation is difficult to review. We found that block diagrams were not only lengthy and detailed but included a mixture of autocoder programming symbols and conventional symbols. In general, only the programmer who prepared them could fully understand them.

3. It is difficult to get access to programmers and systems design personnel. EDP personnel, under pressure to write programs and debug and rewrite programs, have little time to do anything but their productive work.

4. There are frequent changes in programs. These changes affect the auditor's understanding of the

system and require many amendments to the write-up of the system.

5. There is incomplete information on the master magnetic tapes. We found that orders were not on the accounts receivable Basic Record tape. We had planned to use this information in performing some of the tests included in our computer audit programs. Hence, we had to adopt alternative procedures.

Time

From an auditor's viewpoint, two problems are associated with the time factor:

1. A significant amount of time is required to evaluate the system of internal control in a sophisticated computer installation and to develop computer audit programs; hence,

2. A significant audit fee is incurred — in this case, $10,500.

We spent about 530 hours which consisted of:

1. Evaluating the system of internal control in order entry, invoicing, and accounts receivable cycle and formulating tests — 230 hours.

2. Developing computer audit programs to perform year-end work in accounts receivable:

   a. Flow charting, input-output design, and block diagramming — 230 hours.

   b. Program coding, keypunching, assembly and testing — 70 hours.

The Audit-EDP team performed all of the work except program coding, keypunching and assembly. This work was done by non-client personnel who were programmers at a local bank. The additional out-of-pocket cost to a client for this work is not very significant in relation to our lowest billings rates and in relation to the "opportunity cost" of using their own programmers during a conversion period.

The auditors must be aware of the significant amount of time required to audit a computer installation and should appraise the client of this fact before performing the work. This does not mean that the auditor has to approach a client with "his hat in his hands." Certainly, the client should be informed that the amount of time spent initially evaluating a system and developing computer programs will not be necessary in future years and will be partially offset by the reduction in time performing audit procedures manually.

In addition, there are basic financial management reasons why a client may be anxious to have an evaluation of the internal controls of a computer installation and to have us develop computer audit programs. One of the major characteristics of an electronic data processing sys-

	EXHIBIT 2	FIRTH STERLING, INC.				PAGE 4
		ACCOUNTS RECEIVABLE CIRCULARIZATION SEPT. 30, 1963				
NUMBER	NAME AND ADDRESS	T S	BALANCES	DIFFERENCE	NO REPLY	EXPLANATION AND DISPOSITION
0333500	ACE INC 2105 WINSPEAR AVE MADISON ILLINOIS	1 O	7280.31 937.41	BALANCE 30 DAYS 60 DAYS 90 DAYS		
0350000	ACME COMPANY 7055 BEST RD LANSING 4 MICH	1 O	12408.47 2463.94	BALANCE 30 DAYS 60 DAYS 90 DAYS		
0514000	ADDER CO YAKIMA WASH	1 O	33347.91 23180.43	BALANCE 30 DAYS 60 DAYS 90 DAYS		
1161000	BOOM TOOLS 12360 ASPEN LANE BOULDER COLORADO	1 O	6037.19 3022.76	BALANCE 30 DAYS 60 DAYS 90 DAYS		
1466000	CRISP FORGING MFG LOWELL MASS	1 O	34246.84 23082.57	BALANCE 30 DAYS 60 DAYS 90 DAYS		
2511000	DUNHILL SUPPLY 4890 SOUTH CANTON ST CANTON OHIO	1 O	5772.28 2236.99	BALANCE 30 DAYS 60 DAYS 90 DAYS		
2620075	EARTH-MOVERS INC PUYALLUP WASH	1 O	11784.47 7121.74	BALANCE 30 DAYS 60 DAYS 90 DAYS		
2646000	ESTHER TOOLS COLLEGE LANE WILLIAMS PA	1 O	7234.73 255.96	BALANCE 30 DAYS 60 DAYS 90 DAYS		
3170000	FIRST SUPPLY 6360 DIVISION RD BATTLE CREEK MICHIGAN	1 O	8098.33 75.20	BALANCE 30 DAYS 60 DAYS 90 DAYS		
3262310	GUNN FORGING BARNESVILLE INDIANA	1 O	6738.26 3212.17	BALANCE 30 DAYS 60 DAYS 90.DAYS		

PAGE TOTAL   10 ACCOUNTS   BALANCE 132948.79   30 DAYS 65589.17   60 DAYS   90 DAYS