INDUSTRIAL DATA PROCESSING APPLICATIONS REPORT

Applications	Accounting, Inventory Control
Type of Industry	Tubular and Frame Scaffolding
Name of User	Scaffolding (Great Britain) Limited Mitcham, Surrey England

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Equipment Used	I. C. T. 1301 Computer Systems (Two)

Synopsis

Scaffolding (Great Britain) Ltd. is presently using two I. C. T. 1301 computer systems to handle a number of accounting and inventory control functions. The present system evolved from the use of a punched card system.

The hire or rental invoicing and inventory controls systems are discussed in detail in this report. As part of the hire invoicing routine, material movements are recorded providing effective control over these items and thereby preventing loss.

Other applications include operations to produce sales, purchase and nominal ledgers in addition to payroll and costing.

Fourteen years ago Scaffolding (Great Britain) Ltd.'s financial records were kept manually with the use of keyboard operated accounting machines.

The aftermath of World War II brought about a heavy demand for the company's services, resulting in a rapid expansion of the firm's representation throughout Great Britain. This entailed extensions to the administrative and accounting services at the head office.

To meet these demands, in 1952 the company decided to introduce an I.C.T. 40-column punched card data processing system. This system was comprised of: one Tabulator and Summary Card Punch, three Automatic Key Punches, one Sorter, and one Automatic Verifier.

When it became operational in 1954, the first function of this system was to mechanize the sales ledger. In the process of doing this, a conversion from the "balance brought forward" method to an "open item" method was effected. This had two main advantages:

1. Monthly statements were mailed in time to meet customers' deadlines which allowed for a settlement to be reached in the same month. This also provided customers with full details of all outstanding items.

   The numerous inquiries regarding the make up of the balance brought forward were considerably reduced.

2. The collection of overdue accounts was speeded up; periods of credit were rapidly contracted and an effective system of credit control was introduced.

Scaffolding (Great Britain) Ltd. provides the building industry with tubular and frame scaffolding and other building equipment. Trading is divided into three main categories - contract, hire and direct sale - and is operated through an outlet of over 100 depots.

The company is also actively engaged, through its Associated Companies, in the following areas:

1. Shuttering
2. Timber plant manufacturing
3. Structural engineering
4. Equipment rental (not specifically connected with the building industry)
5. Automobiles
6. Exports
7. Videotape and television services
8. Mail order

In the overseas market, the company is represented by Associated Companies in Ireland, South Africa, the United States, Holland and through the Dutch organization, Germany and Spain.

By a series of progressions the following were transferred to the data processing system:

1. Creditors ledger
2. Nominal ledger to trial balance stage
3. Debtors ledger
4. Wages (partial)
5. Job costing
6. Contract material movement records

The incorporation of contract material movements into the data processing system enabled the company to exercise an effective control over all materials to and from sites - from the beginning to the completion of a contract.

Prior to this, the losses of rental equipment on site caused considerable concern. However, with the new system, it was possible to provide site supervisors with detailed statements of losses immediately after a contract was completed. This enabled an early investigation to be carried out and the loss to be recovered, either by charging the loss to the site contractor or by finding the material.

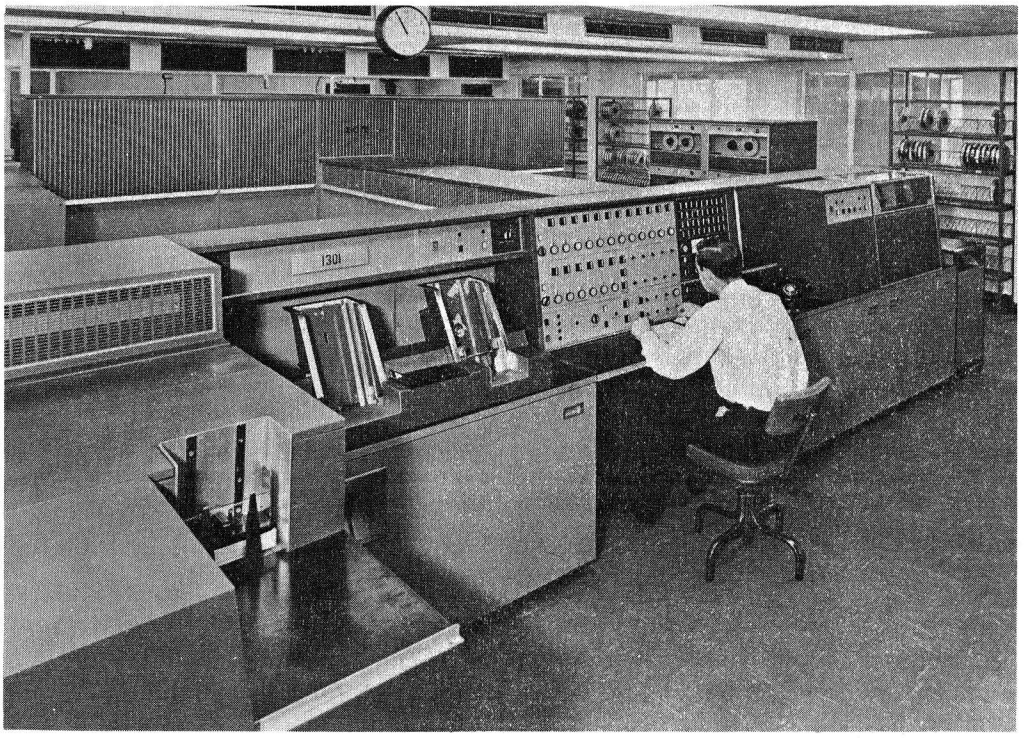
By 1960 the capacity of the data processing installation was at least six times greater than the original installation. Despite this, however, it proved inadequate to meet the increased demands being made on it.

The development of the company is reflected in the following comparisons:

		1955	1960	1966
No. of Accounting Depots	-	14	28	108
Sales Ledger Accounts	-	5000	10000	26000
Invoices per year	-	70000	140000	360000

Taking this expansion into consideration along with the company's future plans for development, board approval was obtained to computerize the accounting procedures. In 1960 an order was placed with International Computers and Tabulators for a basic 1301 computer system which included: one 600 char/min reader, one 100 char/min punch, one 600 char/min printer, 400 words (12 decimal digits per word) core store, and 12,000 words (12 decimal digits per word) magnetic drum storage.

The storage capacity of the computer has since been increased to: 1,200 words of core store, 36,000 words of magnetic drum storage, and four 16 kc magnetic tape decks.



I. C. T. 1301
INSTALLATION AT
SCAFFOLDING (G. B.) LTD.

In January 1966, a second computer, identical with the first but with a magnetic tape storage, was installed.

All medium sized computers which were then on the market or about to be introduced were studied. The I. C. T. 1301 computer was considered the most suitable and economical. The first computer was installed in February 1963 and became operational immediately.

During the interval between placing the order and delivery of the second computer (two years), three programers had written in machine code and proved 50 programs. Some of these were quite complicated; the payroll program, for instance, consisted of approximately 24,000 instructions.

The transfer from conventional punched cards to the computer was completed within nine months. This operation was complicated by the fact that all brought forward data was recorded in 40 column cards which had to be transferred to 80 column cards for computer input. In addition, the alpha code for 40 column was different from the 80 column code. In all, this entailed a reproduction process of approximately one million cards.

Operating in two 7-1/2 hour shifts, the main applications processed through the computer at present include development of the sales, purchasing and nominal ledgers in addition to payroll, costing and invoicing functions. The system also produces reports on stock movements.

In all applications, data is recorded only once and then automatically processed through to final accounts. Final documentation is produced without any intermediate manual processes.

As a point of interest, Scaffolding (Great Britain) Ltd.'s method of punched card verification differs from that which is normally adopted, in that an automatic key punch is used which can be set to either punch or verify - the function to be performed being under the control of the operator.

The two operations are independent, but any one machine can be used for either operation.

The result is that a punch operator creates a slotted hole in the card three millimeters in length in the normal punch position. If the verifying operator punches the same position, the slotted hole will be punched one millimeter higher, thus creating a hole four millimeters in length.

The punched and verified cards are then passed through an automatic verifier, which senses, in one operation, every punched position in the 80 column card. All cards which contain punched holes three millimeters in length are signaled as errors by the automatic insertion of a blank card.

THE SYSTEM

Hire or Rental Invoicing

Data Preparation

Movements of rental materials are recorded on two basic documents - delivery tickets and return tickets - which are prepared at the depots and transmitted to the head office.

The data is then transferred from the tickets into variable field punched cards which can contain up to 10 different stock movements per card.

If a new account is opened, the customers name, address and site details are also recorded in punched cards. A similar procedure is carried out for any amendments to these records.

Rental Rates

Each retion comprises several depots. The rates for each region are held on magnetic tape file, which eliminates ticket pricing.

There are occasions, however, when commodities are rented at special increased rates. In these instances the rate to be charged must be quoted on the delivery ticket which is input to the computer together with the other data. The special rate will then supersede the standard rate.

Units and Components

Units, such as towers, consist of a number of parts. For invoicing purposes these must be charged as a unit, but for inventory control each part has to be accounted for.

If a part or parts of a unit are returned, the unit as such must no longer be invoiced as a whole unit; instead, those components remaining on site must be charged.

The invoicing system is divided into four distinct but interrelated operations:

OPERATION 1. Input data occurring in random order, for each depot, is internally sorted to a predetermined sequence by the computer and written on tape.

OPERATION 2. The input data is then validated. Prices are included with the valid data and rewritten on tape.

Invalid data is withdrawn from the system and reported to an investigation department by means of a punched card which contains the following information: depot originating the document, document number and date, and nature of error; i. e. invalid commodity code data card missing, etc.

OPERATION 3. Updating of hire (rental) site ledger accounts, preparation of invoices and updating statistical records.

During this process further validity checks are carried out. In the main these fall into two categories:

1. Material discrepancies; i. e. material returned from a site which differs from material delivered, indicating an error in documentation.

2. Accounts for which the computer failed to find the name and address or site records, indicating a failure in the communications system.

The investigations department is notified of all errors by means of a punched card which also indicates why the data has been rejected and withdrawn from the system.

OPERATION 4. Invoices are printed and entries to the debtors personal accounts, the debtors ledger control account and income nominal accounts are created.

Invoicing

Invoicing takes place four times per month on an alphabetical cycle. This procedure can be broken down into three main sections:

a. Raising initial charges for the minimum rental period regardless of the alphabetical cycle.
b. Rendering monthly charges in respect of material where rental continues.
c. Raising final charges when a site has been cleared; again, regardless of the alphabetical cycle.

Initial Charges

When a delivery of material is made to a customer, an initial charge for the minimum rental period must be raised immediately.

The minimum period is dependent upon the type of commodity and can be for one day, or from one to four weeks; e.g. the minimum hire (rental) period for an access tower is one week. It doesn't matter whether the customer retains the tower for a period of one day or one week; the full minimum charge will apply.

Recharging - Minimum Rental Charges

Minimum rental charges are raised on delivery, but recharging is always in arrear; e.g. if a ticket containing scaffolding boards is being processed, the minimum rental period is four weeks. The earliest this can be recharged, provided it is still out on hire, is 29 days after the start of the minimum rental period.

On the next invoicing cycle in which the account is due for recharging, the computer examines the transactions. If the minimum rental period has expired and the material is still out, the rental charges are calculated from the date rental began up to the recharging date. The amount of the initial charge is deducted. The balance remaining is the charge to be invoiced for the next rental period.

Recharging - Continuing Rental

Provided that no material has been shipped to or from a customer, the recharging process becomes operative on the next appropriate invoicing cycle.

If the total charge is less than $8.40 (or three pounds), no invoice will be raised; this rule will apply for three months. On the third month, regardless of the total value, an invoice will be raised.

Returns

If the returns do not clear the site - i.e. there is still a balance of rental material on the site and the account is not due for recharging - the data is written to the file but will not be acted upon by the computer. At this point, charges will be rendered up to the final rental date and any balance remaining will be invoiced to the recharging date.

Returns Which Do Not Clear A Site

When material is returned, the returns are allocated to the oldest delivery ticket. This allows one return ticket to be offset against a number of delivery tickets for a particular site. When it is necessary to offset returns against a number of delivery tickets, the customer is informed of this by having the letter B printed against the particular commodity. This indicates that the balance of returned material has been offset against another delivery ticket on another invoice.

This process can be followed by reference to the figure on page SCAF/7. It is seen that the total of steel tube delivered on ticket D7487 was:

		885 ft. returned on ticket R1144
		1,287 ft. returned on ticket R1171
TOTAL	-	2,172 ft. delivered

The first return of 885 ft. is therefore charged up to the final rental date; i.e. 17 September 1966.

The second return of 1,287 ft. is charged up to 30 September 1966, the end of the next rental period.

The letter, B, which preceeds the quantity of 1,287 ft. indicates that the balance of returned steel tube on ticket R1171 has been allocated against another delivery. Another invoice is issued to cover this balance.

HIRE INVOICE

SGB

SCAFFOLDING (GREAT BRITAIN) LIMITED
SGB SHUTTERING LIMITED
SGB BUILDING EQUIPMENT DIVISION
HEAD OFFICE: MITCHAM, SURREY

Telephone: MITcham 3400
Telegrams: SCAFCO MITCHAM

DECIMAL CONVERSION TABLE
.125 = 1d. .625 = 5d.
.250 = 2d. .750 = 7d.
.375 = 3d. .875 = 9d.
.500 = 4d.

TICKET No.	TICKET DATE	Period Charged Wks.	Days	DESCRIPTION	★	No.	UNIT	RATE s.	d.	PER WKS.	VALUE £	s.	d.
R1144	17.9.66	1	0	STEEL TUBE 8G		885	FOOT		0.625	4		11	6
		1	0	5FT STEEL PUTLOGS		4	EACH		4	4			4
R1171	30.9.66	2	6	STEEL TUBE 8G	B	1287	FOOT		0.625	4	2	10	3
		2	6	5FT STEEL PUTLOGS		224	EACH		4	4	2	16	0
D7487	12.8.66	5	0	5FT STEEL PUTLOGS		12	EACH		4	4		5	0
		5	0	UNIVERSAL COUPLER		200	EACH		2.250	4	2	6	11
		5	0	PUTLOG COUPLER		210	EACH		2.250	4	2	9	3
		5	0	JOINT PIN		50	EACH		2.250	4		11	9

TO
ARTHURLIE HOMES LTD.,
CROSS STREET,
HEADBARR,
SCOTLAND.

SITE
JERVISWOOD,
MAINS ESTATE,
LANARK.

£ s. d. DEPOSIT | £ s. d. PREPAYMENT | CODES

★ 1, 2, 3 or 4 — THIS COLUMN INDICATES:— MINIMUM CHARGE FOR PERIOD UP TO NUMBER OF WEEKS SHOWN.
B — BALANCE OF RETURN HAS BEEN ALLOCATED AGAINST ANOTHER DELIVERY.

PLEASE REFER ANY ENQUIRIES CONCERNING THIS INVOICE TO:—
INVOICE DEPARTMENT MANAGER
BUILDING EQUIPMENT DIVN., MITCHAM, SURREY
MITcham 3400, Extension 410,
OR YOUR NEAREST DEPOT

LAST INVOICE No.	DATE	BULKED FROM	HIRE PERIOD FROM	CUSTOMER'S ORDER No.	CARRIED FORWARD TO NEXT PAGE	NET MONTHLY ACCOUNT £	s.	d.
14062	22.9.66		11.9.66 TO 15.10.66	AH/2359		11	11	0

ON ALL ENQUIRIES PLEASE QUOTE

Account No.	Site	Depot	Invoice Date	Invoice No.	Page
AI 208	2	202	27.10.66	42044	

SCAFFOLDING (G. B.) LTD. SAMPLE INVOICE.

In the case of five-ft. steel putlogs, the total quantity out on site was 240. Four of these were returned on ticket R1144 and 224 on ticket R1171. This left a balance of 12 on delivery ticket D7487.

The returned items have been charged up to the final rental date. The balance of 12 remaining on site is charged up to 15. 10. 66 (15 October 1966); a period of five weeks since October is a five week trading period. The company operates on a 4-4-5 week trading period system.

Returns Which Clear A Site

When materials are fully returned, a final charge up to the final rental date must be rendered immediately, regardless of when the account is due to be re-invoiced. The statement "hire completed" is printed at the foot of the final invoice.

If the final charge is for an amount under $14 (or five pounds), no invoice is raised and the account is closed.

Bulking

The bulking procedure is a process whereby the balances remaining on the delivery tickets are no longer treated individually for invoicing purposes but are combined and charged on one invoice each month. The advantages of this are threefold:

1. If six separate deliveries had been made to a site and each was treated in isolation, it would involve the preparation of six separate invoices each month. Through the bulking system only one invoice will be raised after the initial two invoices.

2. The amount of paperwork is reduced.

3. Savings are effected in stationery costs and in the reduction of the size of the data files.

In summary, the hire or rental invoicing routine covers the following:

1. Updating customers accounts
2. Invoicing initial charges, continuation charges and final charges.
3. Preparation of monthly statements of stock movements for each depot and the company.
4. Preparation of monthly statements of site stocks for each depot.
5. Preparation of entries to the debtors personal accounts and debtors ledger control account.
6. Preparation of entries to the nominal income accounts.
7. Updating statistical data from which monthly management statistical schedules are produced.

Inventory Control

As a result of the contract material and hire or rental invoicing systems, an effective control over site stocks has been established.

When a movement of material occurs, an updated ledger sheet is produced for each site affected. This ledger sheet advises the control section of the balance of material remaining on site.

If all the materials on site should have been returned and the final balance shows a quantity of material is outstanding, the computer will interrogate the control section by printing at the foot of the ledger sheet the inquiry "IS THIS JOB COMPLETED?"

These inquiries are acted upon by an investigations department which takes steps to close the account and charge the customer for the deficiency.

At monthly intervals, a statement of current site balances is supplied to each depot manager. These statements, in addition to giving full details of all stock movements, also include - in the case of hired material - a historical record of all charges raised against each site from the time the first delivery was made.

By this means, although centralized control is operated at the head office, each depot manager is informed at regular intervals of the current stock position for each site for which he is responsible. This enables customer queries to be settled on the spot.

Monthly summarized commodity schedules of inward and outward stock movements for each depot and company are also prepared. These are brought to account in the main inventory control system.

RESULTS

The system at Scaffolding (Great Britain) Ltd. is being used for hire or rental invoicing, inventory control and a number of other applications ranging from cash receivables to the preparation of monthly reports. All operations which were previously handled by a punched card system are now being handled by the computer system.

Included in monthly reports are trading statements for the various depot areas and companies.

The system has also enabled Scaffolding (Great Britain) Ltd. to prevent the loss of materials by developing effective controls.