Integrated accounting using a variety of equipment

By J. R. Hopkinson

Aldermaston, the Headquarters of the Weapons Group, U.K.A.E.A., is probably better known in the computing world for its use of large systems such as the I.B.M. 704, 709, 7090 and 7030 ("Stretch.") Nevertheless, in the shadows of these systems, we have been developing an A.D.P. System to deal with our accounting and some other related responsibilities.

The story commences in April, 1957, when a conventional I.B.M. punched-card installation was set up around an electronic calculating punch in what was then a growing organization. The primary object was to introduce an economical integrated data-processing system within the accounting organization.

Although to a large extent we have achieved the object of integrating our domestic book-keeping procedures, we only claim to have scratched the surface of this intriguing problem, (we now realize that we did not really know the meaning of integration), and it will take an immense amount of time and imagination before we can really obtain the full benefits which the latest electronic systems have to offer.

But the theme of the Cardiff Conference is "practical experience," and, therefore, we can leave this absorbing, but abstract topic for the theoreticians.

Accounting organization

Our accounting organization can be compared to that of a medium-sized commercial firm, responsible for the usual accounting functions such as paying some thousands of weekly and monthly paid employees, bills, accounting for some 50,000 stock items and extensive costing and budgetary control systems, and all their related functions. Prior to 1957 it was possible to meet these responsibilities by clerical and keyboard systems, but it became obvious to all that some additional form of mechanization would have to be introduced.

It was decided to take advantage of the opportunity arising from the replacement, for scientific work, of the punched-card equipment by the I.B.M.704 by setting up a separate commercial punched-card installation. Our philosophy was straightforward. First, we, on the commercial side knew nothing of punched cards and felt strongly that practical experience was worth any amount of theory. We still hold those views. Secondly, we felt it was obviously simpler and safer to graduate to the use of computers via punched cards than to jump in at the deep end.

Nevertheless, it was very tempting to know that on the other side of the wall was the I.B.M. 704 on which, although it was working around the clock, there was a certain amount of time available. We resisted the temptation, built up a small team of enthusiasts, and set about learning the trade. It may be of interest to note that we have no committees whatsoever concerned with

A.D.P; one person is responsible to the Chief Accountant for the efficient running of the installation.

Our policy is to recruit our A.D.P. staff from within the organization. This has been successful, for it is much easier and takes far less time to train an intelligent man to become a programmer than to educate him into the peculiarities of one's own organization.

I also feel that the computer manufacturers and others have wrongly fostered the idea that it must take many man years of prior planning and work before installing a computer. The reasons for this, I believe, are twofold. First, five years ago, although there were many experts, few people knew very little concerning A.D.P. Secondly, even when the knowledge and experience became more widely available the machines themselves were not.

Within a year we had launched a number of successful related applications including payrolling. Although the pundits often scorn the use of computers for payroll preparation we feel that it is a highly disciplined application which, if carried out successfully, secures the confidence of both the staff and, more important still, the management

With payroll, in particular, we feel we have succeeded. We are either actually processing, or planning to do so during 1962, the weekly and monthly payrolls for all the U.K.A.E.A. establishments in the south of England, covering establishments as far apart as Orfordness in Suffolk and Winfrith in Dorset.

Using computers

It was the payroll problem that first tempted us to look at the possibility of using one of the large computers. Encouraged by our scientific colleagues, we attended their I.B.M. 709 programming courses, and eventually produced a program simulating an I.B.M. 604 operation. In any week the payroll could be calculated either on the I.B.M. 604 or the 709, as convenient, despite the fact that the 604 is a sterling calculator and the 709 is a computer designed for scientific work with binary or binary-coded decimal (B.C.D.) input. Pay cards were written on magnetic tape in B.C.D. code, and results were written on tape in B.C.D. Cards were punched off-line from tape in the correct layout for listing payrolls on an accounting machine. Apart from the off-line operation of writing on tape and punching from it, the 709 required about 20 minutes to calculate results, which the 604 needed five hours to produce. When the 709 was replaced by the 7090

5

the calculating time was reduced to 6 minutes. The 7090 has now given way to the 7030 ("Stretch"), but our payroll preparation is now carried out on an I.B.M. 1401.

The use of the 7090 as a standby for a 604 system may appear at first sight to be ridiculous, but from it we learned the hard way some of the problems of magnetic-tape systems, and at the same time had an effective emergency standby for our payroll responsibilities.

We have also used the 7090 for a stock-control application, and in connection with actuarial valuations of our Superannuation funds.

None of these jobs were particularly outstanding in themselves, but by the time our I.B.M. 1401 arrived in September 1961, we had become accustomed to dealing with computers. We are now physically integrated with our scientific colleagues. Two compatible and fully interchangeable I.B.M. 1401 Tape Systems stand side by side serving either the Stretch as off-line equipment, or the ever-growing needs of the administration. This arrangement has obvious advantages, and we feel rather proud that we have progressed from punched cards to the joint use of computers in less than five years.

The integrated accounting system

It would take much longer than this paper allows to describe in any great detail the integrated A.D.P. accounting system, but from the following prime documents:

(1) Stores transaction vouchers.
(2) Suppliers invoices.
(3) Journal and cash book vouchers.
(4) Orders placed.
(5) Clock cards (punched cards) and attendance records.

(6) Personnel records.
(7) Pay records.

The following end products are achieved:

(1) Costs statements.
(2) Budgetary control statements.
(3) Payrolls and associated information.
(4) Superannuation records.
(5) Traders credits, cheques and remittance advices.
(6) Stores ledgers.
(7) Personnel statistics.
(8) Rent and hostel ledgers.
(9) Various day books.
(10) Creditors accounts.
(11) Vote accounts (system of accounting peculiar to Government Departments).
(12) Miscellaneous management statistics.

There are two further applications which are in the process of development:

(1) Stock control—using Keyboard/Punched-card links.
(2) Inventories of assets and equipment.

The 4K store of our present 1401 Tape System will be increased to 8K next year, and by this time we plan to make a critical examination of our whole accounting system. This we feel we are in a better position to do than previously, for we are now confident that we can at least handle the hardware.

Conclusion

Our approach to the whole problem has been based on the logic, rightly or wrongly, that there is no substitute for practical experience. We have never aimed for, or claimed sophistication, but rather have concentrated on learning a new trade. Sophistication can come later.

LEAPS—the first three years

By W. S. Ryan

This paper describes some of the problems of applying computers to time-critical work.

1. Introduction

The initials LEAPS stand for London Electronic Agency for Pay and Statistics, a Post Office computer installation situated in Armour House near St. Paul's Cathedral. The first objective of the computer project, on which work commenced in 1956, was to compute salaries and wages for the 112,000 Post Office staff employed within the London Postal Area.

LEAPS equipment consists of:

2 National-Elliot 405 computers, each with 5 magnetic-film mechanisms split between 2 film units, and appropriate peripheral equipment for punched paper tape and card input and tape output.

2 off-line Samastronic printers, each with a spare switchable printhead.

Operational work began in April 1959, and since then the load has been progressively built up. At present the payroll load is 48,000 weekly and 7,500 monthly payees, all employed in the London area.

In addition LEAPS processes pensions for 52,000 ex-Post Office employees (12,000 weekly and 40,000 monthly), prepares Overseas Telegraph Accounts, telephone exchange line costings, and telephone service statistics. Paper tape is the input medium used for all payroll and pensions work; punched cards are only used in one or two of the smaller applications.