1970

PARLIAMENT OF TASMANIA

REPORT OF THE STANDING COMMITTEE OF PUBLIC ACCOUNTS

ON

AUTOMATIC DATA PROCESSING BY STATE DEPARTMENTS AND AUTHORITIES

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AUTOMATIC DATA PROCESSING BY STATE DEPARTMENTS AND AUTHORITIES

Members of the Committee

Messrs Neilson (Chairman), Austin, Baker, Barenger, Braid, Costello and Pearsall.

REPORT

Following comments by the Auditor-General in his 1969 Report the Committee decided to examine the State's activities in this comparatively new area.

Inspection

The Committee visited the offices of the Metropolitan Transport Trust to inspect the Trust's automatic data processing facilities, for the purpose of enabling members to familarise themselves with the type of equipment being used. Discussions were held with the Chairman, Mr A. W. Johnson and the Secretary/Accountant, Mr A. O. Williams and the computer staff.

Evidence

The following witnesses were examined: Mr M. J. Jillett, Public Service Commissioner, Mr V. S. Webb, Manager of the A.D.P. Section of the Public Service Commissioner's Department, Mr L. A. Giblin, Chief Accountant, Hydro-Electric Commission, and Mr F. A. Peters, Comptroller of Accounts, Transport Commission.

The Public Service Commissioner told the Committee that when the State provided accommodation for a Computer Centre in the new State Offices building, Murray Street, the Commonwealth undertook to make available to the State computer facilities on a ' bureau basis ', that is, with work handed in at the computer and collected when finished. Charges are based on computer time actually used and processing is performed in accordance with instructions supplied by the State in the form of programmes. The agreement had effect from 1 July 1968, and programmer training was provided free of charge by the Commonwealth Bureau of Census and Statistics prior to commencement of the agreement.

The Computer Service Centre is located on the lower ground floor of the building. The Tasmanian Government's use of the computer is controlled through a section of the Public Service Commissioner's Department located on the ground floor of the same building. The Section provides a systems analysis, design, programming and data preparation service, for departments and instrumentalities. The emphasis in the Section is on data processing rather than on engineering and other technical processes.

The Hydro-Electric Commission has established two computer installations, one at Head Office which is used for processing accounting records and other work such as hydrology records, and the other, installed at the Tasmanian University as a joint venture with the University as a scientific machine, used for engineering and scientific problems.

The computer at the Hydro-Electric Commission's head office is a commercial installation, used for automatic data processing. This installation was not an initial step but rather a progressive step in the production of accounting records. In 1950 the Commission moved away from conventional bookkeeping machines by installing 36 column punched card machines for the most suitable accounting functions. Advancement to 80 column equipment was made in 1960, and in 1966 a small card processing computer was added. In 1968 it was decided to instal the I.C.L. Model 1902A computer and the conversion is still in progress at the moment. The applications of the Commission's two computers are different and their manner of operation also differs. For automatic data processing input and output volume and speed are relatively high. By mutual agreement the Commission has access in emergencies, such as break-down during pay preparation, to two privately owned computers on a hire basis. The Commission's commercial installation is available to the same two companies when they experience similar difficulties. The computer at the University is available for hire to outside organisations for complex problems subject to the prior needs of the joint owners.

The Transport Commission changed over from the unit record equipment utilised since 1960 to the stored programme concept in February 1966, concurrent with conversion to decimal currency. The Commission finds that its computer is adequate for its purposes and does not need to use the outside facilities. The records of the State Superannuation Fund Board are kept on magnetic disc files and work for the Board occupied between 40 and 50 computer hours annually.

The Computer Service Agreement with the Commonwealth provides for a fixed scale of charges for computer time as follows:—

One shift operation	$68 per hour
Two shift operation	$46 per hour
Three shift operation	$41 per hour

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At present the computer operates on a two shift basis. The magnetic tapes used by the State are charged for at the actual cost to the Commonwealth. The cost of computing time used by the A.D.P. Section in developing approved projects is met from Consolidated Revenue. When the programme is operational costs are charged to the Department or authority concerned through the Suspense Account. The charge is not $46 per hour but $54 per hour, the additional sum being applied towards the cost of magnetic tapes and other incidentals.

Since the establishment of the A.D.P. Section of the Public Service Commissioner's Department in 1968 the staff has been fully engaged in analysing existing systems, designing, programming and establishing a wide variety of computer systems and applications. In his 1970 Report the Auditor-General gives details of programmes being handled by the computer. The Public Service Commissioner told the Committee that the present situation is as follows:—

Public Service Establishment and Personnel System:—Completely operational and updated weekly.

Nurses Registration System:—Completely operational and updated quarterly.

Artificial Breeding Board Accounting and Statistical System:—Completely operational and updated monthly.

Schools Board of Tasmania Higher School Certificate Examination System:—Operated satisfactorily for 1969 examinations. Changes in examination requirements have necessitated major system modifications which are currently being programmed.

Education Department Personnel and Pay-Roll System:—Following a detailed analysis of the Personnel System a report incorporating design proposals was submitted to the Education Department and accepted. Programming is now proceeding with a view to eventual integration with the pay-roll system.

Treasury Stamp Duty Returns System:—This system is almost complete. However, following the recent rejection of Commonwealth legislation, further development has been deferred.

Housing Department Rental and Purchase Contract Accounting System:—A detailed systems report has been completed and submitted to the Housing Department for evaluation.

Public Works Department Plant Usage Accounting and Control System:—A detailed report is currently being prepared.

Lands' Titles Department:—By utilising a programme written by an officer of the Lands and Surveys Department, the A.D.P. Section has been able to provide a regular service twice a week for checking the mathematical accuracy of all sub-divisional surveys lodged at the Titles Office. The Department was formerly using private bureau facilities in Melbourne for this work. By using the local service costs savings of the order of $2,500 per annum have been effected.

Minor Projects

Tourist Survey Programme completed and results evaluated by the Treasury.

Loans Amortisation Programme—Completed and used by both the Treasury and the Directorate of Industrial Development and Trade.

Education Department—School Age Grade Statistics (in conjunction with the Bureau of Census and Statistics)—produced annually.

Forestry Department Systems:—The systems which have been developed to date and others which are currently being developed fall into two categories:—

1. Processing of routine forest inventory data.

2. Research applications.

Type 1 covers:—

(*a*) Plantation Inventory—Measurement of some 300 sample plots (about 30,000 trees per annum).

(*b*) Native Forest Inventory—Measurement of approximately 500 sample plots (about 25,000 trees per annum).

(*c*) Mature Forest Assessment—Measurement of some 450 sample plots (about 9,000 trees per annum).

(*d*) Sample Trees—Detailed measurement of some 300 felled trees per annum.

(*e*) Weight/volume conversion factors for pulpwood—Measurement of about 300 sample loads of pulpwood per annum.

A version of the Native Forest Inventory to process the back log of data was recently completed. Eventually the data on some 250,000 trees will be processed under this system.

Type 2 covers research applications which use a very comprehensive mathematical analysis programme to predict inter alia tree volumes from actual measurements.

The Forestry Commission expects to also use the computer in another category, namely simulation. It is possible to simulate the growth of stands of trees by means of a mathematical model. By this means, the effects of cutting can also be gauged in advance. This type of programme can be of considerable use in the field of forest management where the final effect of decisions might not otherwise be known for several decades.

Public Works Department Systems:—Programmes developed to date cover the following areas.

Road Planning and Design—Six individual programmes in a set which provides for rapid comparison of alternative designs with the objective of obtaining an optimisation of road costs.

Traffic Engineering programmes for analysis of data collected in traffic counts and transportion studies.

Land survey boundary programmes for verification of mathematical accuracy of surveys.

Bridge design programmes to test alternative structural designs under various loadings and conditions.

In the year ended 31 May 1970, the total computer time used by all departments on the Commonwealth computer amounted to 625 hours. Individual use was as follows:—

Programmes developed or being developed by:—	Hours (Approx.)
A.D.P. Section	298
Forestry Department	201
Public Works Department	91
Department of Agriculture	11
Education Department	12
Lands and Surveys Department	12

at the present time A.D.P. Section computer usage is of the order of 3½ hours per day.

The Hydro-Electric Commission's commercial computer is used for expenditure control, stores accounting, payroll and personnel records and hydrology records.

The Transport Commission's computer currently is used for all expenditure accounting covering the functions of payroll preparation, stores, inventory control, accounts payable and financial and cost accounting, also motor vehicle registrations, staff records, employee earnings and statistical information are processed. The monthly rental entitles the Commission to use the computer for up to 176 hours in any one month. The total annual charge is $45,244 for the installation. The actual operation time has averaged 152 hours per month, which is 87% of one 40 hour shift per week. It is anticipated that full utilisation will be achieved during the current financial year. Any further expansion will necessitate increasing the capacity of the machine. This would enable the Commission to record and print drivers' licences, of which there are approximately 166,000.

Since the A.D.P. Section of the Public Service Commission's Department handles requirements for most Departments it is necessary for some method to be used to decide priorities. Initially a Committee consisting of the Public Service Commissioner, the Under-Treasurer, the Director of Public Works and the Deputy Director-General of Education decided the priorities on the basis of two factors; need and the capacity of the then inexperienced programmers. The present position is that the Public Service Commissioner makes these decisions. The Commissioner said that he has to refuse any project which he does not consider absolutely essential. There are of course some applications which are not really suitable for programming. For example the computer could handle aptitude tests to select applicants for vacancies, but this would hardly be worthwhile considering the complexity of the necessary programme and the relatively small numbers involved. As the Hydro-Electric Commission witness explained the economics of computer usage are complicated. It takes time, having made an assessment, to set-up a programme, and in the meantime circumstances may change. The Commission provided an example, the order of savings in accounts clerks in accounting for stores:—

Period (Years)	Equipment Installed	No. of Stock Line Balances	No. of Clerks employed in this work
Up to 1950	Ledger posting machines	29,000	8 clerks
1950 to 1960	36 col. punched card	65,000	10 clerks
1960 to 1966	80 col. punched card	70,000	9 clerks
1966 to 1970	1004 computer / 1902A computer	70,000	5 clerks

It is estimated that the likely effect of installing the commercial computer at Head Office is that the total accounting staff in the State will be reduced from 212 in January 1970 to 174 by December 1972, a reduction of 18%. The Commission has found that when conversion to computer operation occurs in some area, it is not unusual to experience an increase in staff while the old and the new systems overlap.

Isolation from the mainland leads to problems for Tasmanian operations in finding staff, back-up and maintenance services, exchange of information and expertise with large installations in similar mainland organisations, access to educational and training facilities, and early introduction to new or improved equipment.

The A.D.P. Section of the Public Service Commissioner's Department is staffed by the Manager, the Deputy Manager, nine Programmers, one Female Office Assistant, four Female Data Processing Operators (Data Preparation) and one Junior Male Clerk. Some Departments have their own staff who write computer programmes to solve complex engineering, scientific and technical problems. The Forestry Department has three programmers-in-training under the direction of a Senior Research Officer who has considerable programming experience. The Department was making extensive use of a private computer prior to the installation of the Commonwealth Computer and many of its programmes have a high data pro-

cessing content. The Public Works Department employs two programmers and one data processing operator. Like the Forestry Department it was using other computer facilities prior to the advent of the Hobart computer. The bulk of its computer work is of a technical nature but it has some data processing applications, in particular the Hobart and Launceston Transportation Studies and data relevant to road design. The Lands and Surveys, Agriculture and Education Departments each employ one or two officers who are partially engaged in programming but these Departments have no data preparation facilities of their own.

The Committee was interested in the fact that use of the Commonwealth Computer is well below capacity. Three shift operation is possible but two shift operation has only recently come into effect. The Public Service Commissioner agreed that there was still a lot of time left which the State could use but he explained:—

> It is not so much a matter of computer time as the capacity of the programmers. To prepare for any additional work . . . any major undertaking involves some months of preparing and designing the system and preparing the programme.

The Committee was told that programmers were fully occupied and it is for this reason that it has been necessary to pay close attention to the matter of priorities in selecting projects for the computer. There are no personnel being trained for programming work at the moment. Whereas the programmers employed by the Public Service Commissioner's Department are trained by the Commonwealth at Canberra, the Hydro-Electric Commission has a policy of internal training by its own tutoring staff. This has enabled a planned schedule of use of the computer to be followed. However the recent attracting to private industry of several key personnel has caused some minor delays. The Hydro-Electric Commission's future programme contains several major applications which will necessitate the training of additional programmers. There will be more emphasis on specialised systems analysts and it is more difficult to acquire these people than programmers.

In the Transport Commission there has been a rapid development in procedures and techniques by the programming staff in utilising the computer. This rapid development was made possible by the original systems design providing for full integration of all procedures, thereby allowing expansion without reprogramming and production of consistently high quality work at the most economical cost. The Commission considers that so much has been achieved with a relatively small staff because of their high standard of logic and techniques in systems and programming.

CONCLUSIONS

Since the State is already involved in the use of computers, and it seems clear that use should and will increase in the future, it is imperative to see that Tasmania is not restricted by lack of staff. The indications are that not only in Tasmania but elsewhere the demand for automatic data processing is considerably ahead of the capacity of personnel at the moment. The computers used here are working below their full potential capacity. This makes the work being done expensive. There is also the point that some projects have to be delayed in favour of others with higher priority.

There does not appear to be a problem where what is involved is occasional use of sophisticated mathematical formulae, as the committee was told Departments are finding that professional staff are becoming capable of writing the necessary programmes. There is not much doubt that the future training of these personnel will ensure that they are able to handle these small volume, complex input applications.

However, in the field of data processing, where a large volume of input information requires a suitable programming and data preparation staff, specialists need to be trained. Salary levels overseas are extremely high. Levels interstate and in private enterprise are considerably higher than in the State Government service. Because of this it is doubtful whether staff can be attracted in any quantity by increasing rates here. The empasis should be on training through the State's educational institutions to encourage and prepare persons who are already in the State to undertake this work. The important thing is to make every attempt to avoid as far as possible a permanent situation whereby computer staffing is below the optimum level.

Ministerial Party Room,   W. A. NEILSON, Chairman.
    House of Assembly,
        Parliament House,
            Hobart, 3 November 1970.