equipment does not absolve man from the responsibility of thought. In fact, use of such a powerful tool without careful and thorough preparation results only in a magnification of any error and the generation of large quantities of incorrect data, an unsatisfactory outcome for any attempt at problem-solving.

A manager whose operations require a considerable volume of work of the kinds described above should ask himself this question: leaving aside all consideration of cost and of feasibility, how fast, how often, and how accurately would he like to have these operations performed? If the answer involves increasing the present speed, frequency, or accuracy, or all of these, he should then put down in writing exactly what the operations are, step by step, but again without regard to cost or feasibility. Many managers, as well as executives and scientists, have failed to appreciate how their problems might be answered by a computer because they think of the work to be done primarily in terms of existing manual or largely manual routines.

With his tasks now described and his ideal standard of operation established, the manager is in a position to call in a computer systems analyst. The analyst would review the specifications, adapt them for the computer, advise on modifications to increase their suitability for electronic data-processing and make suggestions about the choice of equipment to do the job. A computer programmer will then translate the application into computer language. It has to be stressed that translation of the originator's specifications into a computer program is not a quick and easy task. From initiation of the project to initial operation on the computer two to six months or possibly even longer may elapse.

Uses for Computers in Government

Examples of successful applications in government can be divided into five different types.

1. Mass Data-Processing

Many of the government's extremely large essentially bookkeeping and accounting tasks are today handled by computers. The Comptroller of the Treasury uses a large multi-million dollar IBM 7074 computer to perform the payroll calculations for some 150,000 classified civil service employees. The same computer is also used to perform the cheque reconciliation function not only for payrolls but for all federal cheques issued for such purposes as family allowances, student loans, and old age pensions. A total of five million cheques are handled each month.

Another large computer in the government is used by the Department of National Revenue to process all income tax returns. First, a list of last year's taxpayers which was recorded on a series of reels of tape is used to

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