

099336

Handwritten signature/initials



COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20543

099336

B-114829

MAY 27 1976



The Honorable Wayne L. Hays, Chairman
Joint Committee on Printing TNO1300
Congress of the United States

Dear Mr. Chairman:

AGC00178

Enclosed is our summary of improvement actions taken by the Government Printing Office in response to the General Accounting Office report entitled "Opportunities to Improve the Utilization and Management of Automatic Data Processing Resources, Government Printing Office" dated February 26, 1975.

Consistent with our recommendation, the Public Printer has assigned a high priority to insure that our improvement suggestions are carried out. Although improvements are not yet complete, the Government Printing Office is making good progress in establishing top management control, planning for automatic data processing systems and resources, and modernizing application systems.

The summary addresses all of the principal issues discussed in our February 1975 report. Our comments on actions taken by the Government Printing Office are based on our brief followup review in December 1975, which was limited to interviews with Printing Office personnel and a review of information contained in agency reports and files.

The contents of the summary have been discussed with the Public Printer and Government Printing Office data processing management officials who concur. If you desire any additional information, please contact us.

BEST DOCUMENT AVAILABLE

Sincerely yours,

Handwritten signature of Thomas B. Heath

Comptroller General
of the United States

Enclosure

~~703134~~

099336

FGMSD-76-58

ENCLOSURE

ENCLOSURE

SUMMARY OF GENERAL ACCOUNTING OFFICE
FOLLOWUP OF COMPUTER UTILIZATION AND
MANAGEMENT AT THE GOVERNMENT PRINTING OFFICE

COMPUTER UTILIZATION

Utilization of two large IBM computer systems (an IBM 360/65 and a 360/50) was less than half their practical capacity. The primary causes of low utilization follow:

- The Government Printing Office (GPO) was operating its computers with a less advanced operating system which could not effectively use all the capacity of the equipment. (An operating system consists of special computer programs that monitor and control the operation of the computer system.)
- Several applications or jobs processed on the computers did not take advantage of the computers' full capabilities. For instance, manual intervention by computer operators slowed processing; jobs were excessively dependent on punched cards, a slow-processing media; and computers were not programed to provide for continuous processing even though this is practicable and more economical.

We also found that GPO could release a small IBM 360/40 computer by modifying the design of the inventory control system being processed and by transferring this work to one of the larger computers.

GPO action

In our opinion, GPO has taken action to improve computer utilization.

To more effectively use the capacity of the computer equipment, GPO began installing IBM's more advanced operating system in 1974. By December 1975 GPO officials estimated that half the workload previously processed on the old operating system was being processed with the newly installed advanced operating system. (About 30 percent of 750 computer application programs making up about half the workload had been converted to run on the new system.) At the time these programs were being converted, GPO also did some redesign work to improve the quality of output reports and other systems products and to reduce the associated costs. (See p. 3.) Both the conversion to the

BEST DOCUMENT AVAILABLE

BEST DOCUMENT AVAILABLE

BEST DOCUMENT AVAILABLE

ENCLOSURE

ENCLOSURE

advanced operating system and the design improvements will increase the effective utilization of GPO's computer equipment.

Since December 1973 when we measured computer processing activity levels at GPO, the number of jobs run by the computer center nearly doubled from a monthly total of about 5,700 to a current level of about 11,000. Most of this growth occurred in 1975. In December 1975 GPO acquired a larger IBM 370/145 computer by transfer from the U.S. House of Representatives. According to GPO data processing management, the IBM 370/145 and the existing 360/65 computer systems, when completed with higher speed storage devices, are probably sufficient to handle all of GPO's computer requirements for the immediate future. Some computer activity measurements have been made, but the actual rates of utilization for the components of the systems presently installed are not yet known.

GPO's justification for this major equipment upgrade shows a potential \$1.2 million saving over the 3 remaining years of the 370/145 lease. Whether savings of this magnitude will occur depends largely on how successful GPO is in accomplishing all of the processing on the 370/145 and 360/65 computer systems enabling them to release the IBM 360/50 system.

GPO is continuing its efforts to improve computer utilization. Additional computer application programs are being converted so they can be processed by the advanced operating system, computer scheduling procedures are being prepared to help smooth out the computer center workflow, and operating procedures are being studied to find opportunities for additional improvements in computer processing.

The small IBM 360/40 computer that GPO expected to release was actually released when it obtained the large IBM 370/145 from the U.S. House of Representatives. The inventory control system previously processed on the 360/40 computer has been moved to the larger 360/50 computer; however, the inventory system has not yet been modified to make it simple to operate and less costly. (See p. 4.)

COMPUTER-BASED APPLICATION SYSTEMS

BEST DOCUMENT AVAILABLE

Paper inventory and financial management systems

Several of GPO's major computer application systems needed to be modernized to improve the reliability of

BEST DOCUMENT AVAILABLE

ENCLOSURE

ENCLOSURE

system products and to reduce the cost of running and maintaining the systems. The major applications we evaluated included:

- Paper inventory system. This system produces information needed for scheduling printing production and for processing and controlling paper stock, a critical raw material.
- Financial management system. This system includes applications in payroll, cost accounting, and financial accounting.

GPO action

Along with the conversion program to a more advanced operating system discussed above, and working with users on new systems designs, GPO also began in 1974 to concurrently assess the quality of its existing application systems. Priorities for modernizing these applications were assigned by a GPO steering committee. To date, several systems have already been modernized to eliminate manual tasks, reduce the computer processing time, and improve the quality of output.

Probably the most noteworthy improvement effort completed to the time of our followup review is the automation of the work-in-process inventory during 1975. Hundreds of thousands of punched cards have been eliminated by placing this data on magnetic tape and disk files. Computer edits have been added to help check the data for accuracy. Daily reports are now available in 4 hours instead of the previous 24 hours. Computer time has been reduced from 3 hours daily to about 30 minutes. Some processes have been completely eliminated, and five full-time clerical and technical positions which were excess to the needs of the work-in-process section were released to the GPO Manpower Control Board. Annual savings from this modernization project are estimated by GPO to exceed \$210,000.

Another major benefit from this effort is that faster and more accurate processing has contributed to more timely customer billing and has enabled a \$46 million reduction in the combined accounts receivable and work-in-process inventory balances from November 30, 1974, to November 30, 1975. The improved cash flow from collection of the receivables has facilitated more prompt payment to GPO suppliers and a \$38 million reduction in accounts payable during the same year.

BEST DOCUMENT AVAILABLE

ENCLOSURE

ENCLOSURE

GPO is continuing the modernization program. A report to the steering committee on November 15, 1975, showed 22 modernization projects underway. Of these, 5 were completed, 12 were on schedule, and 5 were behind schedule because of insufficient data processing personnel to do the work or because of lower priorities.

Reproducible inventory control system

This system is GPO's computerized, on-line system for controlling reproducible printing media, such as metal type, molds, mats, and photographic negatives.

On line in this case refers to a computerized system that provides GPO with immediate access to inventory information through a computer terminal. Our 1974 review showed that there was no need for this system to be on line and use up one-third of the capacity of GPO's 360/40 computer. We concluded that a simple, less costly batch-processing procedure would suffice.

GPO action

A GPO committee studied this system and concurred in our suggestions. However, as of December 1975, the system was still running on line although it had been transferred to the larger 360/50 computer because the 360/40 computer was previously released. GPO personnel told us that the reproducible inventory control system was again being studied and that other information requirements of the user would be considered while attempting to simplify the system.

Master typography program

This program is a large complex computer program that accepts written material previously converted into computer readable form, rearranges and organizes the material into printable pages, and records the data on magnetic tape. This tape is then converted into a photographic image of the page to be printed. This process is known as electronic or computer-assisted composition. GPO relied on one programmer to maintain all eight versions of this program and, in our opinion, ran the risk of losing all or part of its capability should the one programmer become ill or leave.

GPO action

GPO has unsuccessfully attempted to hire programmers with composition programming experience. A printing

BEST DOCUMENT AVAILABLE

ENCLOSURE

ENCLOSURE

specialist well qualified with this type of experience has been hired, but he is actively engaged in implementing a new composition system. One person continues to maintain the master typography program. Because GPO is making a long-term commitment to expanding computer-assisted composition and because the potential adverse impact of losing the services of one key programmer is increasing, we believe one or more programmers should be hired or transferred from the data processing group to begin training immediately in composition programming.

CONTROLS, STANDARDS, PROCEDURES, AND
ADMINISTRATIVE MATTERS

Our previous report discussed several problem areas in automatic data processing (ADP) administration and control. Each is separately addressed below.

1. No formal mechanism existed for the Public Printer or chief executives of other major functional areas to participate in data automation decisions having broad organizational impact.

GPO action

The Automated Data Services Steering Committee was formed in March 1974. This Committee consists of the Public Printer who is Chairman, the Deputy Public Printer, the three Assistant Public Printers, and the Director of Data Systems Service.

Through December 1975, the Committee had met 19 times and had been helping the Public Printer to make decisions about automated systems policy, plans, priorities, and ADP resources allocations. It had also helped to monitor and evaluate GPO progress in modernizing old application systems and developing new ones.

We believe that improved top management control over data automation activities in GPO has resulted from the work of this Committee and that another beneficial result has been better communications among management, operating elements, and the Data Systems Service that provides computer support.

2. GPO had no formal long-range plans for accomplishing its informally stated goals and objectives, including systems modernization and development, and data processing resource requirements.

GPO action

In accordance with an automated data services planning policy statement issued by the Public Printer on October 1, 1974, each major organizational function in GPO submitted its first plan in January 1975. According to the Public Printer, not all of these plans were carefully thought out and documented to show the required objectives, benefits, and costs. However, after additional work by the user elements, GPO's Steering Committee was able to assign priority classifications by the middle of 1975 to 71 proposed new projects and about 38 additional systems modernization proposals.

The published plans include statements of expected benefits from each project and related estimated costs of development and annual operation for a period of 5 years. Plans for the 5 years beginning in 1976 were due to be published in January 1976. GPO expects them to be more precisely developed than were the plans for 1975 and to include better cost and benefit estimates.

We believe this long-range data automation planning is a major accomplishment which provides a basis for acquiring, allocating, and managing GPO's data processing resources to best serve the needs of the organization.

3. GPO did not have a well-developed network of formal procedures, standards, and controls which would help to insure reliable computer-based systems, safeguard assets, and minimize the investment in data automation activities.

GPO action

Some attention has been given to these matters but considerably more will be required. For example, formal standards and procedures have been drafted for computer operations, equipment operational performance, computer scheduling and control, computer facility security, and other subjects. These are presently being reviewed by data processing management, though none have yet been issued. Work on standards for systems design and development had not started as of December 1975, nor had arrangements been made with another computer facility to insure continuation of processing should GPO computers become inoperable.

BEST DOCUMENT AVAILABLE

The responsibilities for standards and procedures and for certain aspects of ADP quality control, such as monitoring the efficiency and effectiveness of computer hardware and operating systems, are assigned to the Technical Support Division of the Data Systems Service. The division manager was hired in December 1975 and, at that time, six of eight authorized ADP technical positions had been filled.

Other quality control functions, including reviews of application systems after they become operational, are assigned to the Data Systems Service administrative staff. Data Systems Service management told us that its efforts to recruit qualified professionals for this staff have thus far been unproductive but will soon be resumed. As of December 1975, all seven professional and clerical positions were vacant.

The GPO internal audit group is presently helping the data processing personnel to specify internal controls and audit trails for two application systems now being designed, and it has made suggestions for adding controls to an existing system. The scope of its involvement in reviewing these systems and more technical aspects of data processing is limited because the audit staff includes no personnel with professional ADP backgrounds. A request by the Office of Audits for a new staff member with these qualifications is now before the GPO Manpower Control Board.

4. A new organizational plan for the Data Systems Service with new functional descriptions was approved by GPO management in July 1974, but formal ADP job descriptions had not yet been prepared.

GPO action

Formal job descriptions have been written for Data Systems Service personnel. As of December 1975, 35 of the 198 authorized positions were vacant. Half of these were application programmers and computer specialists who, according to Data Systems Service workload estimates, are especially needed to meet scheduled work commitments. Recruiting for these positions is continuing, and data processing managers expect them to be filled within the next few months. One hundred of the presently employed Data Systems Service staff of 163 are computer operators, data entry personnel, and others assigned to the computer operations division. With improved ADP job scheduling, more efficient computer usage, further reduction of punched

card processing, and elimination of one computer processing shift, Data Systems Service management estimates a possible reduction of up to 25 personnel spaces in this division.

5. GPO did not have a structured plan for ADP staff development defining career paths and specifying the training and experience required for advancement.

GPO action

Some newly acquired ADP training materials are being used for training systems analysts, programmers, and computer operators, and some "outside" courses have also been taken by Data Systems Service personnel at GPO expense. As of December 1975, a structured staff development program had not been started because the Data Systems Service administrative staff had no personnel to work on this task.

6. The GPO method of charging users for computer services was based on wall-clock time and did not accurately reflect the actual time of computer use.

GPO action

A new charging system was started in July 1975. This system accounts for actual computer usage plus other appropriate cost factors, such as keypunching, programming and systems analysis, lines of printout, etc. Knowledge of these monthly costs for ADP will help the users to more objectively decide what services they wish to have performed for them by GPO's Data Systems Service.

CONCLUSION

Notable improvements are being made in the management and application of ADP resources at GPO although not all of the problems discussed in our original report have been satisfactorily resolved. We previously estimated that as suggested changes are appropriately carried out, financial benefits in ADP and other operational areas could gradually build to an annual level of \$2 million to \$2.8 million over the next 3 to 5 years. Based on progress made to date, this estimate continues to appear realistic.