REPORT BY THE U.S.

General Accounting Office

Government-Wide Guidelines And Management Assistance Center Needed To Improve ADP Systems Development

In more than 57 reports in the past 10 years, GAO has identified management weaknesses in the design and development of large, complex Federal data processing systems. These weaknesses led to the waste of over $300 million and systems which

    --were not cost effective,

    --did not meet agency needs,

    --took too long to develop, or

    --simply did not work.

The Director, Office of Management and Budget, should issue guidelines for a structured management approach to ADP systems development, require use of the guidelines throughout the Government, and set up a cost-reimbursable center to assist agency top management in planning, designing, acquiring, and evaluating large, complex ADP systems development projects. OMB agreed to consider GAO's recommendations.

AFMD-81-20
FEBRUARY 20, 1981

B-201441

The Honorable David A. Stockman
Director, Office of Management
    and Budget

Dear Mr. Stockman:

In August 1979 we reported to the Chairman of the House
Government Operations Committee on our review of the problems
associated with developing large, complex data processing sys-
tems (FGMSD-79-27, app. I). We pointed out that Federal agen-
cies have failed many times in this type of development because
they have neither the proper guidance nor the necessary assist-
ance for top management. Thus we recommended that a manage-
ment assistance center be established and noted that we had
developed a structured management approach for automatic data
processing (ADP) systems development which we felt should be
recommended to you.

OVERVIEW

The purpose of this letter is to (1) suggest a framework
of principles and procedures for managing systems development
(see app. II) which could be the basis for issuing Government-
wide guidelines and (2) reiterate the need for a management
assistance center for computer software and systems develop-
ment.

PRIOR STUDIES REVEAL GOVERNMENT-WIDE PROBLEM

We have issued 57 reports during the last decade which
identified the most common problems in the design and develop-
ment of large, complex, Federal data processing systems.
These systems

--were not cost effective,

--did not meet user needs,

--had prolonged development cycle and cost overruns, or

--simply did not work.

These problems were caused principally by

--inadequate planning,

--insufficient or ineffective management and user involvement,

--inadequate management approach for controlling systems development,

--inadequate control over changes to application programs, and

--inadequate budgeting and financial control.

These management deficiencies and resulting system problems have cost the Government a great amount of money, time, and effort. For example, we found that better management could have saved nearly $300 million in just 10 of the systems reviewed. We believe these types of difficulties are indicative of a Government-wide problem that will continue because:

--There is no fully defined or standard structured framework for managing systems development within the Federal Government. Many agencies have their own management guidelines. However, we found several agencies whose development efforts were frequently unsuccessful because they had guidelines which were incomplete, not fully implemented, or not followed in actual practice.

--Some Federal agencies do not have (1) sufficient and effective top management involvement and direction and (2) a strong central office to facilitate agency-wide planning, coordination, and control of ADP resources.

--Top managers at many agencies do not have the required knowledge and expertise to effectively control systems development.

THE PROBLEM CONTINUES

Since June 1979, we have issued the following reports on systems development at various Federal agencies which show that the deficiencies and problems still exist.

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Farmers Home Administration's
ADP Development Project--Current Status
and Unresolved Problems (CED-80-67,
Feb. 18, 1980)

Farmers Home Administration (FmHA) provides financial assistance to rural Americans who are unable to obtain reasonable credit terms from other sources. To assist in this, FmHA has an ADP system supported by the computer center in the agency's national finance office in St. Louis.

In 1974 FmHA decided to replace the current system with the Unified Management Information System (UMIS) to provide better management information at all levels of the agency. UMIS development began in late 1975 with expectations of being operational in October 1978.

Initially, FmHA specified that UMIS would provide remote computer capabilities to about 2,000 agency offices. Our February 1978 report on UMIS (CED-78-68) questioned the need for an elaborate telecommunications network and, as a result, FmHA developed another concept which provides for a more centralized data processing operation.

In the 1978 report, we recommended that the Secretary of Agriculture correct certain management deficiencies and system problems. FmHA concurred with our conclusions and recommendations and said it would initiate corrective actions. However, our latest UMIS report in February 1980 (CED-80-67) disclosed continued management problems. We found that among other things:

--UMIS was not viable as designed. UMIS had several basic design problems which would probably make the agency estimates of the cost and time to complete the project highly questionable.

--If FmHA continued development of UMIS, the design problems might result in a system that would be (1) highly inefficient, (2) costly to maintain, (3) difficult to modify, and (4) ineffective in meeting needs.

--Initially FmHA had not adequately studied and documented user needs and a requirements study still had not been done.

--FmHA had mismanaged and poorly controlled UMIS' development by (1) not assigning a full-time project manager, (2) not forming a steering committee until 1978--3 years after the project had been initiated,

(3) not using standard management control techniques effectively, (4) not establishing cost accounting, budget, or planning systems, and (5) not managing the software contractor effectively.

The results of FmHA's not properly managing the UMIS project were that the (1) projected implementation date will be at least 5 years later than planned, (2) cost to complete UMIS as designed, or its alternatives, may reach $42 million-- $25 million more than the budget estimates, (3) operational costs of UMIS as designed will be higher than they would have been with proper management, and (4) system may not meet the basic needs for which it is being developed.

The Social Security Administration Needs to Develop a Structured and Planned Approach for Managing and Controlling the Design, Development, and Modification of Its Supplemental Security Income Computerized System (HRD-80-5, Oct. 16, 1979)

The Supplemental Security Income (SSI) program was established to provide benefits for needy aged, blind, and disabled people. The program began January 1, 1974, and serves over 4 million people.

The SSI program is dependent on an ADP system which controls and maintains the benefit payment process. Field offices use a telecommunications network to access the ADP system and computerized data bases at the Social Security Administration (SSA) headquarters in Baltimore.

This report pointed out that SSA lacked a structured and planned approach for managing and controlling the design, development, and modification of its computer-based data processing systems. Instead, SSA followed an unstructured, often hurried approach which resulted in

--incomplete computer program and system documentation,

--unvalidated and uncontrolled system modifications, and

--users' needs not always being met.

Also, the Department of Health, Education, and Welfare Audit Agency had neither participated in the design and development of the SSI computer-based data processing systems to help assure that adequate automated controls and audit trails existed nor reviewed the automated controls incorporated in the system since it went into operation. This

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lack of a structured ADP system development approach resulted in numerous control weaknesses in the SSI system which, as of September 1978, caused $25 million in erroneous benefit payments.

Our report stated these weaknesses could be corrected by (1) establishing better management controls over the system design, development, and modification process and (2) ensuring implementation of those controls.

Improvements Needed in the
Tennessee Valley Authority's
Management and Use of Its Automatic Data Processing Resources
(EMD-79-102, Sept. 6, 1979)

This report identified the following weaknesses in the ADP planning structure and process:

--TVA did not have an agencywide plan to use as a management tool for measuring and controlling ADP activities.

--Top management generally did not support the development of agencywide ADP systems which could cut costs.

--Top management did not require all offices and divisions to use available management systems. Such use could better control ADP system design and development.

--Procedures did not ensure compliance with laws and regulations governing acquisition of ADP services.

--Adequacy of the justification for future ADP equipment was questionable.

--The organization, authority, and responsibility of the ADP audit function was insufficient.

IRS Can Better Plan For and Control Its
ADP Resources (GGD-79-48, June 18, 1979)

This report suggested ways to increase the efficiency and effectiveness of the Internal Revenue Service's ADP operations. IRS needed to do more to perfect its strategy for acquiring and using data processing resources. The agency needed to improve

--long range ADP planning and

--control over, and accountability for, system development.

Various studies and reviews had shown that IRS lacked a formal ADP planning system capable of (1) assuring senior managers' involvement and participation, (2) allocating ADP resources equitably among users, (3) ranking requests for new applications, and (4) fostering cost consciousness among users. In March 1979, IRS established an ADP policy resource board to respond to these problems. More, however, was needed to improve management's overall control over, and planning for, ADP resources.

At the time of this review IRS did not have an ADP cost accounting system to determine the (1) full cost of new systems, (2) relative worth of existing systems, and (3) total ADP cost of IRS programs. Allocating and measuring total ADP costs, as IRS internal reviews had recognized, would foster a greater cost consciousness among users and probably assure more efficient use of current resources as well as limit requests for additional services to those absolutely neccesary.

SOFTWARE DEVELOPMENT EXPERIENCES
SIMILAR MANAGEMENT PROBLEMS AND DEFICIENCIES

The same management deficiencies and problems as those cited in the above-mentioned reports on general purpose systems (finance, payments, tax administration, and management information) also were reported in two broader studies of managing software (computer program) development as discussed below.

Managing Weapon System Software:
Progress and Problems (PSAD-78-112,
July 10, 1978, unclassified digest)

Modern weapon systems use computers and associated software to perform functions critical to strategic and tactical missions. The Department of Defense estimates that it spends over $3 billion annually for weapon system software, and the cost is steadily rising. However, very often, software performance has been unreliable because of serious technical and managerial problems with the way it is designed, developed, tested, and maintained. These problems cause cost overruns, schedule extensions, and, most importantly, degraded mission performance.

This report covered software management for nine major weapon systems estimated to cost over $44 billion. Some of the problems noted were:

--Primary management reports for four of the nine weapon systems did not include software information.

--The Office of the Secretary of Defense's software management guidelines did not emphasize software testing or management of software changes after systems are deployed.

--The Office of the Secretary of Defense had no standard procedures for orderly software testing, and practices varied among programs and even within a single service. Although major weapon systems heavily depend on software to perform critical mission functions, top managers did not fully consider software test results before making major decisions. Experience has shown that software problems have caused at least three times more weapon system unavailability than hardware problems.

--There was no Defense-wide performance criteria for measuring software quality or for judging its acceptability. Independent verification of software design and coding in three systems was not planned before full system integration and testing.

--Operational testing of software before production and deployment was not performed or completed on four systems reviewed. Funds for software testing were either decreased or eliminated because of cost increases in other program areas.

--Software testing in three of nine cases did not include interoperability testing with systems that have a technical interface in order to assess the combined operational performance of the systems.

--Diagnostic software requirements were reduced to cut program costs when other program areas experienced a cost increase.

We made several recommendations to the Secretary of Defense to correct these and other management deficiencies.

In a subsequent letter, the Department of Defense agreed with our findings and conclusions and said it was acting to to implement our recommendations.

Contracting for Computer Software
Development--Serious Problems
Require Management Attention to
Avoid Wasting Additional Millions
(FGMSD-80-4, Nov. 9, 1979)

Federal agencies contract for an estimated several hundred million dollars of software development annually. Although new

software is often developed successfully by outside sources, we found that too many contracts experience cost and schedule overruns, and do not meet agency needs. After surveying 163 software contractors and 113 Federal project officers experienced in software contracting, we found that problems in software contracting are largely due to the

--lack of guidance from the central agencies--Office of Management and Budget (OMB), General Services Administration (GSA), and National Bureau of Standards (NBS);

--agencies overestimating the stage and completeness of their own work before contracting;

--agencies providing sketchy--or no--testing requirements and not describing precisely what the contractor is to do;

--agencies quickly overcommitting themselves (sometimes even before identifying user needs) and failing to control contractors by strict phasing of contracts (stipulating that work be done in logical phases, with agency approval of each phase before proceeding);

--agencies not managing contracts during execution;

--agencies not establishing a single authority (like a project officer) for coordinating the effort; and

--contractors failing to provide adequate software documentation.

During this review we examined, in detail, nine software development contracts. Because of the deficiencies and problems noted above, the combined total costs and development times for those contracts almost doubled from estimates of $3.7 millon and 10.8 years to an actual cost and time of $6.7 million and 20.5 years. In addition, almost none of the software was usable or used as delivered.

NEED FOR TOP MANAGEMENT ASSISTANCE

As we recommended to the Chairman of the House Government Operations Committee in August 1979, the Government clearly needs a chartered, Federal ADP service center to provide managers, particularly top managers, with managerial and technical systems development expertise. Recently the General Services Administration established its Office of Software Development which is responsible for the software exchange program and for assisting agencies through language compiler validation

and conversion of computer systems and software. This office will provide technical aid to Federal agencies and is a very worthy beginning.

Some years ago, GSA with the aid of the Air Force, established the Federal Computer Performance Evaluation and Simulation Center to assist agencies in evaluating and studying their existing or proposed computer systems. Both centers are operated under the financial auspices of the ADP Fund established by the Brooks Act (Public Law 89-306).

However, top Federal managers need management assistance of high technical competence. OMB and GSA also could benefit from such assistance. This new center would help managers, particularly top managers, be more effective in developing ADP systems. The center would

--assist agencies in planning, designing, and acquiring ADP systems;

--independently review and evaluate agency ADP plans and system development plans, designs, and projects;

--assist OMB and GSA by providing independent assessments, suggesting alternatives, and validating requirements and economic analyses for major information system budget and acquisition proposals;

--assist OMB and GSA in developing standards, guidelines, and policy options, as well as in developing new and innovative prototype applications of ADP and data communication technology.

Also, such a center could develop designs and specifications for common functional systems, mathematical/statistical analysis software, and system support software. A management assistance center for software and systems development could be established in a number of ways.

In deciding how to structure the center, two factors should be considered. One, the center could be consolidated with the two other limited scope service activities (the Federal Computer Performance Evaluation and Simulation Center and the Office of Software Development) whose activities would inevitably overlap. Two, it is important to assure

--separation of the assistance function from any regulatory function,

--flexibility of the overall staffing level and the ability to select and release scarce technical personnel,

--coordination with other assistance centers,

--cost effectiveness, and

--responsiveness to user needs.

What we see as most desirable is to create a new Federal ADP service center reporting to the Director of OMB and financed by the ADP fund. The center should be chartered, reimbursed for services, and have the flexibility to adjust staffing levels to meet workload requirements. Also, to preclude overlap of functions, this center should include the two existing service activities mentioned earlier. We also believe a management committee of representatives from selected small, medium, and large Federal agencies should be established to guide the assistance center activities. This committee may require prior and specific congressional approval in compliance with recent appropriations restrictions on interdepartmental boards and committees. (See Public Law 96-74, section 608.) This committee would report to the Director of OMB, thus giving the center some autonomy and giving the user agencies a means of voicing their needs. Consolidation of the two existing service activities into this new Federal ADP service center would be the most effective means of minimizing duplication of effort. The ADP fund is the most appropriate means of financing the center which, of course, requires a full cost reimbursement for services.

CONCLUSION

Effective planning and management control are mandatory if Federal agencies are to obtain the most effective and efficient use of the over $6 billion they spend annually on ADP system development. Because of the cost of ADP systems and their importance throughout Federal organizations, top managers must be properly involved in ADP system development from planning through implementation.

In developing ADP systems, sound management principles must be followed to ensure success--ADP systems that are cost effective, meet user needs, and meet cost and time limits. In far too many cases, sound management principles were not followed and systems were not successful. Inadequate management controls and planning were primary causes of failure in these ADP system development efforts and these failures wasted hundreds of millions of dollars.

RECOMMENDATIONS

To remedy the costly and significant problems in systems development we recommend that the Director, Office of Management and Budget

--issue Government-wide guidelines which will enable agencies to take a structured approach in developing ADP systems. These guidelines should incorporate the management principles and procedures in appendix II;

--require the head of each Federal agency to implement the guidelines;

--establish a management assistance center for computer software and systems development, financed by the GSA ADP Fund, and reporting to the Director through a chartered user committee. The GSA Office of Software Development and the Federal Computer Performance Evaluation and Simulation Center should be consolidated into this new center.

AGENCY COMMENTS AND OUR EVALUATION

OMB was asked to comment on our draft report and its comments are included as appendix III. OMB agrees that agencies have frequently had difficulty developing and managing major automated information systems and attributes some of this difficulty to agency problems in complying with "a complex, and sometimes confusing, array of laws and policies governing the management of Federal computer resources." To this extent OMB believes issuance of good management guidelines will be ineffective in addressing the difficulties. However, OMB is willing to consider issuance of the guidelines as part of its proposed revision of OMB Circular A-71. Office officials suggested that we solicit comments from the agencies as to whether the guidelines are necessary or desirable and that we suggest revisions to the circular.

We already extensively interviewed Federal officials and executives of many private concerns about the content, need, and desirability of the principles and procedures for managing systems development. The response was overwhelmingly positive. We do not think a separate process of commentary is necessary. However, the framework for the guidelines (app. II) will get wide distribution as part of this report and we will be pleased to share any reactions with OMB. We believe the inclusion of this guidance in a new version of OMB Circular A-71 is very appropriate and welcome the opportunity to develop and recommend changes to it.

With regard to our recommendation that OMB establish a central management assistance center for computer software and systems development, including the consolidation of two existing GSA centers, OMB stated that it was willing to consider such an assistance center, but raised concerns that it would (1) duplicate advisory functions of the Secretary of Commerce and the National Bureau of Standards under the Brooks Act (Public Law 89-306), or require a legislative change and (2) place the Government in direct competition with private industry. OMB also suggested that we analyze the benefits of a single assistance center and the resource and staffing levels of such an organization.

We believe there is no need for the management assistance functions for the proposed center to either overlap or duplicate the scientific and technical advisory services function of the Secretary of Commerce and the National Bureau of Standards. We think the two organizations should coordinate their work and assist each other in their respective areas of expertise. We did not recommend the consolidation of these functions and thus do not believe a legislative change is necessary. Also, we believe the new center would require substantial contract resources to achieve the needed flexibility of staffing levels and technical expertise. Its Federal employee component would not need to be any larger than that required to (1) perform policy, planning, design, and evaluation advisory functions, (2) manage the center and its projects, and (3) develop and execute contracts. The degree of conflict with the private sector would, therefore, be slight. Further, we believe that greater and more productive use of the private sector, especially by many smaller agencies, would result from the assistance provided by the center in contracting for systems development services.

We are disappointed in the less than enthusiastic reaction from OMB to this potential solution to what we see as a mounting problem throughout the Government. We believe the need for this type of assistance, as well as the guidance recommended, is amply demonstrated by our report and supported by the findings of the President's Reorganization Project on ADP. We think the full cost reimbursement requirement is an effective check on the center's cost effectiveness. We believe suggested analysis of costs and benefits of the recommended center would be best performed by the executive branch within the context of a specific feasibility study and the various alternatives for implementation.
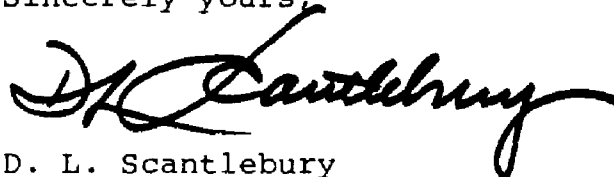
As you know, section 236 of the Legislative Reorganization Act of 1970 requires the head of a Federal agency to submit a written statement on actions taken on our recommendations. You must send the statement to the House Committee on

Government Operations and the Senate Committee on Governmental Affairs within 60 days of the date of the report and to the House and Senate Committees on Appropriations with the agency's first request for appropriations made over 60 days after the date of the report.

We are also sending copies of this report to the Chairmen of the House and Senate Committees on Appropriations, the House Committee on Government Operations, the Senate Committee on Governmental Affairs, the Secretary of Commerce, the Administrator of General Services, and the heads of most Federal agencies.

Sincerely yours,

D. L. Scantlebury
Division Director and
Chief Accountant of GAO

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

B-115369   AUGUST 16, 1979

The Honorable Jack Brooks
Chairman, Committee on
  Government Operations
House of Representatives

Dear Mr. Chairman:

    As you requested, we are reporting on our review of the
problems associated with developing large, complex data proc-
essing systems. Our objective was to identify Government-
wide actions that would help resolve those problems. As you
requested, we also assessed the need and appropriate organi-
zational framework of a management assistance center for
computer software and system development.

    Previous reports issued by us and others have widely
documented the failures of Federal agencies in developing
data processing systems. These failures have resulted in
millions of dollars being spent for systems that were not
cost effective, did not meet user needs, experienced pro-
longed development and cost overruns, or simply did not
work. Since 1970, we have identified almost $300 million
of waste in such efforts. We did not further assess the
extent of such failures but, rather, attempted to identify
ways to improve management control over such development
efforts.

    Our review centered on three agencies--the Department
of the Army, the Veterans Administration, and the Bonneville
Power Administration. We also considered the results of
recent audits we made at the Department of Labor, the Bureau
of Census and National Bureau of Standards in the Department
of Commerce, and the Social Security Administration in the
Department of Health, Education, and Welfare. Additionally,
we reviewed 57 GAO reports issued since 1970 which included
discussions of data processing systems and software develop-
ment. Our findings are summarized below.

NEED FOR MANAGEMENT CONTROL

    The objective in investing in data processing, as with
other major investments, is to develop data processing

                                        FGMSD-79-49
                                          (913340)

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systems and applications that are cost effective and meet user needs, and to do so within cost and time limitations. Since requirements change over time, if development is not completed on schedule, the system may not meet user needs. Cost and schedule overruns can diminish, and even elimi- nate, the cost effectiveness of an application.

Good management principles must be followed to insure the successful development of data processing systems. Those principles include:

--Continual planning, which involves analyzing require- ments and related benefits and gaining appropriate approval for new systems and changes to existing systems.

--A structured approach to managing development work, which involves close supervision (by a project manager) during construction and implementation, and management review of progress and performance.

--Effective top management involvement throughout the development process.

The last point--top management involvement--is essential for a number of reasons. Data processing systems today are an integral part of agency operations and affect the entire organization. They provide information that management relies on as well as products and services that go directly to the public. Also, development frequently requires the coordina- tion of needs among agency components and the cooperation of different department managers; only top management can assure both. Development may also be expensive and time consuming, which means that top management should have an interest in the development process as well as an inherent obligation to pro- vide direction and leadership. Accordingly, top management needs to establish policies that will not only provide proce- dures for planning and controlling system development but policies that will also ensure top management's effective in- volvement in making key decisions and reviewing ongoing work.

MANAGEMENT CONTROL IS INADEQUATE

The three agencies we reviewed have serious weaknesses in management control over system development. They do not have policies or procedures addressing the management prin- ciples discussed above, their procedures were incomplete, or their procedures were not being followed.

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     The Army's directive governing data processing addresses
many important points of good management, but the directive
has procedural weaknesses and is not regularly followed or
enforced. As a result, the Army continues to have weaknesses
in top management control of its largest data processing proj-
ects. The Veterans Administration (VA) has weaknesses in all
areas of system development, with its management authority so
fragmented that it has no assurance that its system develop-
ment resources will be used efficiently and effectively. Bon-
neville Power has many planning and management weaknesses, in-
cluding an overall lack of uniform policies, standards, and
procedures governing system development.

Department of the Army

     The Army is a major consumer of computer resources, using
over 1,200 large computer systems with more than 4,400 appli-
cation systems. While the Army's detailed directives (Regula-
tion 18-1) governing automatic data processing (ADP) manage-
ment include many essential controls, weaknesses continue to
exist in the Army's management of automated system develop-
ment. Those weaknesses include the following:

     --Overall system plans are frequently not developed, and
       those that have been developed do not address major
       aspects of the system or tie into other plans.

     --Top management frequently has not been sufficiently or
       effectively involved in large, complex system develop-
       ment efforts.

     --Users of systems have not always actively participated
       in system development.

     --Overall direction, coordination, and control of system
       development has been weak because a project manager
       has not been assigned as the central point of author-
       ity for most major ADP system development projects.

     --Cost estimates and economic analyses have not consist-
       ently been prepared.

     --Effective procedures have not been established to com-
       pare a system's progress with the approved cost, sched-
       ule, and performance estimates.

     --Procedures have not been adequately enforced for
       approving either new design efforts or major enhance-
       ments and modifications to existing systems.

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These management weaknesses had seriously reduced the
effectiveness of the Army's top management control over
ADP resources.

Veterans Administration

The Veterans Administration uses computers for both gen-
eral and special management purposes--primarily in support of
veterans' medical, insurance, and benefits programs; engineer-
ing and clinical research applications; and administrative
functions. The agency currently has approximately 137 major
system applications. Major new systems are under way and
others are being proposed.

Although VA has recently tried to improve management con-
trol, it still has no assurance that ADP resources are being
used effectively and efficiently because:

--VA lacks an effective agencywide planning process
    for system development.

--Top management has not provided sufficient overall
    coordination and central direction.

--No formal concept or structured management approach
    has been established to control system development.

--Project control has been hampered by inadequate cost
    accounting and reporting and by an inefficient organi-
    zational structure.

These management inadequacies have seriously weakened
VA's control over ADP resources and could easily lead to the
inefficient use of these resources. As you know, we are con-
ducting a separate review of the Veterans Administration's
problems, at your request.

Bonneville Power Administration

The Bonneville Power Administration of the Department of
Energy has a significant investment in computer resources--
equipment, technical staff, and application systems--and re-
lies heavily on computer system support to achieve its assigned
mission. In fiscal 1977, Bonneville spent about $4 million to
operate, maintain, and develop ADP systems and annually allo-
cates over 60 percent of its ADP staff effort to system devel-
opment.

Despite its growing investment and reliance on ADP sys-
tems, Bonneville has consistently failed over the past decade

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to effectively control its ADP resources. Our review dis-
closed serious weaknesses in Bonneville's systems management.

--Its ADP management plan lacks meaningful and accurate
information about individual systems. The plan is
neither authoritative nor considered mandatory, and
it has not been used as a tool to manage ADP systems.

--Top managers and users are not actively involved in
system development activities, and project leadership
is lacking.

--It does not estimate the costs or benefits of future
systems and does not accumulate costs incurred to de-
velop systems.

A certified public accounting firm, during a recent review of
Bonneville's ADP operations, also expressed concern about these
ADP management weaknesses. In the past, three other management
consultants have reported similar weaknesses.

MANAGEMENT WEAKNESSES EXIST
AT OTHER AGENCIES TOO

According to numerous reports we have issued and reports
by others, inadequate planning and management control have
been primary causes of many significant failures in the design
and development of large data processing systems at other
Federal agencies as well. The following table summarizes the
management inadequacies that were identified most often in 57
reports we have issued since 1970.

Management problem identified	Number of times cited
Inadequate planning	49
Insufficient or ineffective management and user involvement	32
Inadequate management approach for controlling system development	39
Inadequate control over changes to application programs	15
Inadequate budgeting and financial control	20

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We believe that these weaknesses in management controls are indicative of a Government-wide problem. Moreover, we believe the problems will continue until a Government-wide policy guide is established and agency management (1) takes an active and effective role in the development of its data processing systems and (2) adopts a formal planning process and a structured framework for controlling system development.

To help correct these problems in management control, we have prepared guidelines setting forth the basic concepts and general procedures for planning and controlling system development. We have also prepared a guide for agency auditors to use in evaluating the adequacy of their agency's procedures for managing data processing system development.

NEED FOR SYSTEM DEVELOPMENT
TECHNICAL ASSISTANCE CENTER

We believe that agency managers recognize the need to exercise greater control over data processing. However, some may be intimidated or handicapped by the jargon and their unfamiliarity with the technical aspects and related problems of data processing. Further, those who try to exercise greater control are often hampered by a lack of information in a format needed for effective review at critical points. Top management and the central agencies are very often also hampered by the lack of independent assessments and opinions. One approach that we believe would help managers, particularly top management, be more effective is to establish a service center that would provide agencies with managerial and technical system development expertise. The center would, on a reimbursable basis:

--Assist agencies in planning, designing, and managing the acquisition of ADP systems (equipment and software).

--Independently review and evaluate agency ADP plans and system development plans, designs, and projects.

--Assist OMB and GSA by providing independent assessments, suggesting alternatives, and validating requirements and economic analyses for major information system budget and acquisition proposals.

--Assist OMB and GSA in developing standards, guidelines, and policy options, as well as in developing

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new and innovative applications of ADP and data communication technology.

In addition, such a center could also develop designs and specifications for common functional systems software, mathematical/statistical analysis software, and system support software (e.g., data base and data communication management).

A management assistance center for software and systems development could be established in a number of ways. Some alternatives are:

(1) Establish the center within GSA or Commerce, fully staff it with Federal personnel or supplement the staff with experts on a contract basis.

(2) Establish an office within GSA or Commerce, staff it with some Federal personnel, and create or re-designate a Federal contract research center to provide additional staff.

In making the decision there are two factors to be considered. One, consideration should be given to consolidating the center with the three other limited-scope service activities (the Federal Computer Simulation and Evaluation Center, the Federal COBOL Compiler Testing Service, and the Federal Software Conversion Center) whose activities would inevitably overlap. Two, it is important to assure

--separation of the assistance function from any regulatory function,

--the flexibility of the overall staffing level and the ability to select and release scarce technical personnel,

--coordination with other assistance centers,

--cost-effectiveness, and

--responsiveness to user needs.

Establishing such a center within GSA or Commerce raises the question of how is it to be distinguished and insulated from other services and regulatory functions. A Federal Contract Research Center would provide a source of assistance that could be made independent of any hardware or software vendor as well as flexible in acquiring and releasing expert personnel. However, such a center would require strong management controls.

7

B-115369

What we see as most desirable is to create a new
autonomous Federal ADP service center combining the operating
concepts of the Federal Computer Simulation and Evaluation
Center and the Federal contract research centers. It would
be desirable to include in this center the three existing ser-
vice activities to preclude overlap of functions. We also
believe it would be a good idea to establish a management
steering committee of representatives from selected small,
medium, and large Federal agencies to guide the assistance
center activities, and the three other service activities
if not consolidated. This committee would give the agencies
who would use the center a means of voicing their needs and
would minimize duplication of effort.

We are preparing a report to the Congress which will
provide more details on our findings and conclusions as well
as our recommendations to the Director of the Office of Manage-
ment and Budget, the Administrator of General Services, and
the Secretary of Commerce. An appendix to that report will
include our guidelines for managing system development.

As you requested, we have not obtained agency comments
on this report. We have, however, written letters to the
Bonneville Power Administration and to the Veterans Adminis-
tration on the results of our review at these agencies. As
arranged with your office, unless you publicly announce the
contents of this report earlier, we plan no further distri-
bution until 30 days from the date of the report. At that
time we will send copies to interested parties and make copies
available to others upon request.

Sincerely yours,

Comptroller General
of the United States

Enclosures

NINETY-FIFTH CONGRESS

Congress of the United States

House of Representatives

COMMITTEE ON GOVERNMENT OPERATIONS

2157 Rayburn House Office Building

Washington, D.C. 20515

November 3, 1977

The Honorable Elmer B. Staats
Comptroller General of the United States
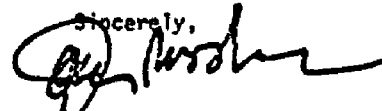Washington, D. C. 20548

Dear General:

The Committee recently received excellent support from
Mr. Wally Anderson and Dr. Carl Palmer in its review of a planned
extension of a sole-source contract for the National Park Service.
I understand that as a result of this review the Park Service is pre-
paring the necessary workload, telecommunications and efficiency
studies to support a fully competitive procurement that will save an
estimated $400,000 a year over the present contract. The expertise
and professionalism displayed by these two gentlemen during this
review was exemplary and I look forward to the results of their study
of ADP planning in Federal agencies.

The Committee and GAO, in their oversight of Government ADP
activities, have recognized that the central ADP agencies have failed
to develop and promulgate clear and concise policies and procedures
to assist agencies with their large and complex system development
projects. In the absence of such guidance, the operating agencies
have developed a myriad of duplicative approaches and techniques which
are generally incomplete and rarely followed, and usually fail. This
has resulted in hundreds of millions of dollars being spent on the
development of overly complex and difficult to maintain systems which
have produced little, if any, benefit and in some cases actually
disrupted the mission they were designed to support.

I request that you initiate a review of this Government-wide problem and determine what specific actions must be taken on a Government-wide basis to resolve this situation. We expect to address this problem in our second round of ADP hearings planned for early next year and it would be most helpful for you to provide at least preliminary findings in that time frame.

With best wishes, I am,

Sincerely,

JACK BROOKS
Chairman

FRAMEWORK OF PRINCIPLES AND PROCEDURES

FOR MANAGING SYSTEMS DEVELOPMENT

The large expenditure of resources to develop ADP systems requires effective planning and management control. We believe the framework of principles and procedures presented here can, if appropriately implemented and applied, greatly improve management of systems development activities and projects. The principles represent essential elements of management control and are the product of extensive analyses of management weaknesses we have observed in systems development. The primary objective of applying these principles is to prevent the most serious problems encountered in ADP systems development projects. We have grouped the principles under three categories: formal system planning, management involvement, and systematic management review and control. In each category we underlined phrases that are essential elements of control, the lack of which has led to past ADP development problems.

FORMAL SYSTEM PLANNING

Long range planning and budgeting for ADP systems are essential elements in managing and controlling systems development resources. Planning must continue through all phases of a system's life cycle. Each major system, regardless of the current phase of its life cycle, should have a principal user designated as responsible for the system's overall planning and management. Plans for all major systems should be coordinated to ensure compatibility with agencywide priorities, needs, and management objectives, and should be integrated with the agency's ADP facility, equipment, and personnel plans.

The planning process for system development should contain the essential elements of control suggested in our evaluation guide "Questions Designed To Aid Managers and Auditors in Assessing the ADP Planning Process" (exposure draft, Aug. 1979).

Specifically, the planning process should provide for

--participation by the several levels and interests of management;

--establishing mission requirements, ADP strategy, and ADP system goals and objectives;

--identifying the specific actions to be accomplished;

--budgeting financial, personnel, and ADP resources;

--measuring and comparing actual accomplishments with
    expected performance; and

--progress reporting to inform appropriate managers of
    the status of planned actions.

Effective system planning should give management a con-
sistent framework for (1) describing and analyzing ADP system
requirements, (2) evaluating alternatives, and (3) determin-
ing the most effective and efficient means of meeting informa-
tion needs. In addition, specific project development plans
should (1) specify the detailed actions required to design,
develop, test, and implement an ADP system; (2) serve as the
basic management and control tool throughout development; and
(3) provide appropriate documentation of the project.

The planning should facilitate full involvement and com-
mitment of all management levels and should be revised, coordi-
nated, and approved at least annually.

MANAGEMENT INVOLVEMENT

Management involvement is an essential element in develop-
ing effective ADP systems. A formal mechanism should be es-
tablished to ensure involvement and commitment of all manage-
ment levels and interests including top management, user man-
agement, and project management.

Top management involvement

Top management should become involved at the earliest
stage of development. To ensure this, a formal executive ADP
management committee, consisting of senior managers from every
major organizational unit, should be established. The agency
head or his deputy should chair the committee and it should
be responsible for consolidating and integrating the func-
tional, financial, and technical aspects of ADP for the organ-
ization.

User participation

Users must actively participate in the development proc-
ess to ensure satisfaction of their needs. Users should be
responsible for identifying their needs and submitting them to
top management for decisions regarding priorities, resource
commitments, and implementation schedules. Users and managers
should work together to define functional requirements for ADP
systems and develop plans to economically meet user needs.
All functional users should participate in the design and de-
velopment process to ensure agreement on objectives, specify
information needs, and outline the scope of the development.

Users must be involved throughout development to ensure
that a project is on schedule, within the budget, and meets
service goals. Users should review a project at significant
milestones to see that all requirements are being met and that
resource expenditures should continue. Users should be fully
informed of progress and be knowledgeable enough to approve
completed work and continuation of the project. Through
participation and communication with ADP managers, users have
greater assurance of a reliable and effective system and are
better prepared to train their personnel in using the system.
The users' participation also contributes to greater manage-
ment control of development resource expenditures.

Project steering committee

To ensure top management control during the entire course
of development, a top management group, commonly called a proj-
ect steering committee, should be formed to regularly oversee
and review progress and make decisions at each critical stage.
The committee should decide to initiate, continue, revise, or
terminate the project and should consider any strategic mat-
ters affecting the project, provide overall direction, and
establish both accountability and primary management controls.
The project steering committee should meet regularly to re-
view and analyze progress and performance and approve com-
pleted work and plans for the next phase before the project
proceeds. Finally, the project steering committee should
certify in writing that a completed system meets its objec-
tives.

The steering committee should include representatives
from three essential functions--the users, the developers,
and the top managers having overall responsibility for coordi-
nation and control of ADP resources.

Often, it may be good to have representatives from other
areas such as law, personnel, finance, and auditing. All com-
mittee members should be at a high enough level to make au-
thoritative decisions based on priorities and directives es-
tablished by the agency head or the executive ADP management
committee. For this reason, the committee should have a for-
mal charter defining the committee's authority and account-
ability for systems development.

Effective, stage by stage, top management involvement--
from project initiation to system implementation--will mini-
mize problems, help ensure effective and efficient use of re-
sources, inform and coordinate, and increase the probability
of a successful ADP system. To be effective, management and
the steering committee need phase-by-phase project progress

and cost reports, adequate technical documentation, and sound
evaluations performed by internal auditors and/or quality
assurance staff.

Project manager

Each ADP system should have a full-time project manager
assigned as a central authority to provide daily direction,
coordination, and control. The project manager should have
authority to decide on personnel allocations, establish proj-
ect plans, schedules, and budgets, and to conduct most tech-
nical activities. This person should coordinate the related
functions in systems development and lead and direct the proj-
ect team. Also, the manager is the key person in assessing
and negotiating trade-offs and arranging meetings with the
project steering committee to keep it informed of project
status, obtain required approvals, and refer problems outside
the manager's authority. Such problems usually relate to con-
flicting priorities, unmet resource requirements, schedule
slippages, or events requiring a major change in direction.
If the system is being developed by a contractor, close coor-
dination between the contractor and the agency project manager
is essential. 1/

The project manager should ensure that Government and
agency regulations are followed, Federal standards are ap-
plied, and system requirements are met.

Generally, the project manager should represent the
principal end user and have a formal charter defining the man-
ager's specific duties and authority.

Internal audit and quality assurance

The internal auditor is responsible for assuring top man-
agement that all systems (1) contain the needed management
and internal controls, (2) produce consistently reliable re-
sults, and (3) operate in conformance with management stand-
ards and approved design criteria. 2/ For financial and ad-
ministrative systems the auditor must actively participate

1/For guidance see: "Lessons Learned About Acquiring Financial
   Management and Other Informations Systems," (GAO, Aug. 1976)
   and "Contracting For Computer Software Development--Serious
   Problems Require Management Attention To Avoid Wasting Ad-
   ditional Millions," (FGMSD-80-4, Nov. 9, 1979).

2/For guidance see: "Auditing Computer-Based Systems," (GAO,
   1980).

in the system design and development process to assure the adequacy of the controls and to act as a user to ensure that there are audit trails for all transactions. Once a system is operational, the auditor has a continuing responsibility to review both general and specific application controls to ensure that the system continues to perform in accordance with management policy and produce consistently reliable results.

For other systems, such as air traffic control, missile and satellite direction and control, and weather data acquisition, these and other essential quality control review steps are often performed by a specialized quality assurance staff and reviewed as necessary by the internal auditors. For sound management control, the internal auditor and quality assurance staff should review the products of each phase of a system development project and provide an evaluation to the project steering committee.

SYSTEMATIC MANAGEMENT REVIEW AND CONTROL

Agency procedures should provide a systematic framework and mechanism for management review and control of ADP systems development. Among these procedures should be

   --cost accounting and reporting procedures,

   --technical evaluation procedures,

   --formal acceptance testing procedures,

   --formal change control procedures, and

   --standard phasing of key activities.

The standard phased approach, discussed on page 19 provides a framework for continual management review and control of ADP system and software development. However, specific review procedures also should be established. The procedures should require that all development projects be reviewed by management and also should specify the management level at which reviews and approvals are required--based on clearly defined thresholds of cost, schedule, scope, and performance. Thus, the relative importance and complexity of a project would determine the extent of management review.

The procedures should ensure that system and software development is reviewed for

   --continuing economic, technical, and operating feasibility;

--comparison of budgeted resources and established
  schedules with actual performance;

--compatibility with other agency systems and overall
  agency objectives; and

--compliance with Federal and agency standards, design,
  and operating requirements, and user functional re-
  quirements and specifications.

The procedures should at least require detailed reviews
at the end of each major phase (described on page 19) with
continual monitoring and intermediate reviews when planned
cost or time thresholds are exceeded or performance criteria
are not met. Such reviews should be decision oriented and
should be accomplished through formal meetings resulting in
appropriate documentation summarizing the project status, rec-
ommended solutions, plans and objectives for the next phase,
and agreements by all parties on the development direction.
The reviews should emphasize findings concerning schedule
changes, resource deviations, scope or design changes, per-
formance shortcomings, and any other significant changes.
The result of such reviews should be a top management deci-
sion to proceed with, alter, or terminate the project.

Cost accounting and reporting procedures

One of management's most useful monitoring tools is a
comparision of actual costs with estimated costs of specific
developmental phases. Such comparisons encourage cost con-
sciousness and let management (1) evaluate progress and per-
formance, (2) decide if system benefits warrant continued
development, and (3) better plan future systems development.
A sound cost accounting system must be established for systems
development as well as for computer operations.

Our studies have shown that good financial data is rarely
available for the costly decisions that managers frequently
must make about ADP activities. Further, incorrect decisions
may be made by people whom a computer center or system serves
simply because they, too, do not know the cost of the services
they receive. Thus, GAO developed detailed guidelines for ac-
counting for ADP costs. Federal Government Accounting Pamphlet
No. 4, "Guidelines for Accounting for Automatic Data Proces-
sing Costs," provides specific guidance on accounting for
systems development costs. We believe this type of cost ac-
counting and reporting should be implemented by agencies as
soon as possible to provide this essential element of manage-
ment control over important resources. As pointed out in
those guidelines, all significant elements of cost directly

related to ADP functions, such as system development, should
be collected and accounted for in ways useful for management,
budgeting, and external reporting.

   In summary, cost accounting and reporting procedures,
conforming to GAO guidelines, should be established and in-
tegrated in the structured framework needed to manage systems
development.

Technical evaluation procedures

   An appropriate analytical framework is necessary to ef-
fectively accomplish the problem definition and evaluation
phases of systems development and allow for reevaluation
throughout a system's life cycle. Systematic procedures
should be established to provide managers with formal meth-
ods for defining and solving ADP problems, investigating sys-
tem objectives and alternatives, and comparing their costs
and benefits. Within a structured management approach, these
procedures should form the basis for obtaining information
needed to

   --justify developing an ADP system or acquiring related
      equipment and other resources;

   --identify and define resource requirements for develop-
      ment;

   --establish budgets and schedules for projects; and

   --report, review, and approve continuing economic, op-
      erational, and technical progress and performance of
      ADP systems.

   These procedures should require sufficient detail in the
evaluation to adequately document a system development project
consistent with its scope, complexity, and costs. The pro-
cedures should provide a systematic process for

   --identifying and defining ADP problems or opportunities,

   --describing the current (and other relevant) ADP environ-
      ments in the agency,

   --determining specific project objectives,

   --identifying assumptions and constraints,

   --identifying and comparing alternatives,

--determining costs and benefits,

--determining key uncertainties and risks, and

--testing evaluation results for sensitivity to varying
  factors.

A completed evaluation should have conclusions and a rec-
ommended course of action, and should be presented to appro-
priate authorities for review and final decision. An evalua-
tion should be updated after each developmental phase or other
key milestone. When a project exceeds specified cost or time
limits, it should be reevaluated to explore all feasible alter-
natives.

Formal acceptance testing procedures

The project steering committee should evaluate the new
or modified system before its full implementation. The com-
mittee should supervise the quality assurance group (or users'
group) in its performance of formal acceptance tests of a sys-
tem to ensure that the system functions as required by the
user. The committee's responsibility requires thorough op-
erational and validity testing of the system's performance,
functional outputs, documentation, operating procedures, and
user procedures.

Formal change control procedures

Almost all systems experience design changes. Some
changes initiated during system development are minor and may
have little impact; others can substantially alter the sys-
tem. Because the accumulation of many changes and the impact
of major changes can seriously affect the system, a formal
change request and authorization system should be established
to review and analyze the impact of each system design change.
Such change control procedures should provide for analyzing,
documenting, and reviewing the costs, schedule, benefits, and
operational impact of all proposed changes. This change re-
quest and authorization system would give management an effec-
tive means for approving, delaying, denying, or combining pro-
posed changes.

Procedures should be established to prevent unauthorized
and potentially inaccurate changes from being incorporated
into the normal operating environment. However small the pro-
gram or system change might be, the system should be tested
before implementation of the change in order to ensure its con-
tinuing integrity. The degree of testing should be commensu-
rate with the importance of the system. For all important

systems a user-management committee with the assistance of
of the quality assurance function should certify that the sys-
tem will continue meeting all functional and performance re-
quirements. The quality assurance group should control all
changes, certifying accuracy and proper acceptance testing to
ensure the continued integrity of all systems.

Standard phasing of key activities

     ADP systems development encompasses numerous tasks and
multiple phases which are characterized by the type of work
and end products required. A widely used and proven approach
in systems development is to divide the work into a logical
sequence of manageable phases. A standard approach, with
well-defined, management-action-oriented phases, should be
established to give management an effective mechanism for con-
trolling projects. The approach must provide review points
enabling management to continually monitor and assess progress
and performance and, where necessary, reevaluate, reschedule,
or terminate development work.

     We believe development work should be divided into a num-
ber of phases. These phases should be standard throughout an
agency and retain a relatively consistent, product-oriented
definition from project to project. We outline below a five-
phased approach, which, while somewhat conceptual and subject
to interpretation, conforms closely to the phase and stage
definitions contained in the Federal Information Processing
Standards Publications (FIPS PUB's) 38 and 64, but incorporates
more of a system's life cycle and stresses the managerial as-
pects more than technical documentation.

     The five phases follow:

Problem definition phase

     This phase is primarily for establishing the objectives and general
definitions of the system's requirements before starting detailed develop-
ment work. In this phase, the mission needs are defined, the problem to
be resolved is described, insight into deficiencies is provided, and the
overall framework for the development is established. Also established
during this phase is the basis for understanding between system users and
designers regarding the system definition and scope, existing data re-
quirements and operating environment, known objectives and performance
criteria, and development plan. Also, an initial estimate of costs and
benefits and an initial analysis of design approaches should be accom-
plished during this phase. The specific tasks accomplished and documents
prepared in this phase are highly variable. The management document re-
sulting from this phase should be a project request or proposal. The re-
maining phases should be formally required by agency regulations.

Evaluation phase

During this phase, an initial, comprehensive study of the project's technical, economic, and operational feasibility should be conducted. The study should include an analysis of current and forecasted mission requirements, technological opportunities, priorities, constraints, and resources. The current system should be explored more thoroughly, new system concepts should be developed and defined, and all alternatives should be examined. The project and each alternative system concept should be evaluated according to objectives, performance criteria, plans, and agreements established in the problem definition phase. When the evaluation phase is completed, the report should recommend alternative solutions and state if the users are satisfied with the planned development. The appropriate level of management should then decide whether the project will meet mission needs and warrants continuation.

Design phase

During this phase, all aspects of the proposed system are described and their relationships determined. Activities include analyzing and documenting (1) design alternatives, (2) functions to be performed, and (3) system requirements and specifications. Specifically, the following should be done during this phase:

--Establish the functional requirements to be satisfied.

--Identify interrelationships of system/subsystem components.

--Specify performance criteria.

--Identify equipment required for operating the system including any new equipment needed to meet functional requirements.

--Describe the design characteristics including (1) results expected from the system, (2) forms and data needed to produce desired outputs, (3) files required for input and output processing and for data storage, and (4) system access requirements.

--Specify the detailed functional requirements to be satisfied, the proposed operating environment, and the specifications for the system, its subsystems, and its interfaces, data bases, and programs.

--Provide a software testing plan which includes (1) detailed specifications, descriptions, and procedures for all tests and (2) test data reduction and evaluation criteria.

Before continuing the project, the user should thoroughly review the work completed in this phase to determine the adequacy and responsiveness of the system. This review should give management sufficient updated information to determine if the system will be cost effective and meet the user's needs, and whether development should be continued, revised, or terminated.

Programming and testing phase

With or without hardware acquisition, this is often the most expensive developmental phase. Computer programs must be written, compiled, tested, and debugged. Extensive documentation must be prepared for computer programs, operation manuals, user manuals, maintenance manuals, and testing reports.

Programs and subsystems as well as the overall system should be tested and evaluated thoroughly before they are implemented. Programs should be tested as they are developed, first individually, and then in logical or subsystem groups. All file and program conversions must be made before complete system implementation. The user, in concert with the project steering committee, should certify in writing that the system meets all requirements and is ready for implementation.

During this phase, users and operators should be trained, and trouble reporting and correction procedures should be established.

Operations and maintenance phase

This phase is primarily concerned with operating, evaluating, and maintaining the system. Once a system becomes operational, it should be completely evaluated to determine its adequacy. System cost-benefit studies should be updated and a technical review of the system should be conducted. Also, periodic reports should be prepared showing (1) any changes made to the system and (2) its current status. After implementation, the entire system (both manual and automated processes) should be reviewed periodically to ensure that the system (1) maintains the necessary internal controls to consistently produce reliable results and (2) operates in accordance with agency and Federal standards and approved design specifications. These reviews can also be used to determine when the system no longer meets user needs so its replacement, modification, or discontinuance can be recommended.

—   —   —   —   —

Standard phasing of key activities provides a structured approach for system development and a systematic framework for management control. During the initial phases the following are developed: (1) the foundation for understanding and agreement between users and developers regarding the scope and definition of the system, (2) what has to be done, and (3) what has to be achieved before proceeding to the more technical steps of system design and programming. This phased approach should complement an agency's overall management procedures. Project monitoring and review should be geared to the phases, facilitate the analysis of resource expenditures, and provide for measurement and evaluation of budget performan of each

phase. Each phase should be successfully completed, reviewed,
and approved by appropriate top managers before the next phase
begins. As each phase is completed, pertinent information re-
garding schedule, performance, cost, and resources used should
be accumulated and documented. This documentation will give
management the information needed to make effective decisions
and an economic evaluation before the next phase begins. Phas-
ing will give more assurance of system reliability and effec-
tiveness and greater management control of resources. FIPS
PUB's 38 and 64 "Guidelines for Documenting Computer Programs
and Automated Data Processing Systems" should be employed
wherever feasible unless applicable agency standards or more
specific versions of these guidelines supersede the FIPS PUB's.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON. D.C. 20503

OCT 3- 1980

Mr. Donald L. Scantlebury
Director, Division of Financial
and General Management Studies
U.S. General Accounting Office
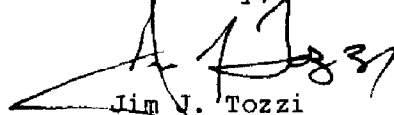Washington, D.C.   20548

Dear Mr. Scantlebury:

This letter provides comments on your draft report entitled
"Government-Wide Guidelines and Management Assistance Center
Needed for Managing ADP Systems Development." This report
recommends that the Office of Management and Budget issue
guidelines and establish a management assistance center to
aid agencies in their management of automated information
systems development activities.

We agree with the GAO that agencies have frequently had
difficulty in developing and managing major automated informa-
tion systems. We believe, however, that many of these
problems result from agency efforts to comply with a complex,
and sometimes confusing, array of laws and policies governing
the management of Federal computer resources. To the extent
this is true, the issuance of guidelines encouraging the use
of good management concepts and principles will not signifi-
cantly ameliorate these difficulties. At the same time, we
are willing to consider the issuance of such guidance,
especially in the context of our proposed revision to OMB
Circular No. A-71, "Responsibilities for the Administration
and Management of Automatic Data Processing Activities." We
have already asked your staff for their suggestions on
revising this document. In the meantime, we would be willing
to issue the guidelines contained in this report if it is
appropriate to do so. Towards that end, we request that you
distribute the guidelines to the departments and agencies
and seek their comments. In particular, you should ask
whether the agencies believe the issuance of these guidelines
in a policy document is necessary and desirable.

The GAO also recommends the establishment of a management
assistance center to provide agencies with a source of
managerial and technical system development expertise. As
you are aware, the National Bureau of Standards, the General
Services Administration and the private sector, among others,
currently offer managerial and technical assistance to the
agencies. Although we are willing to consider the consolidation
of existing Federal assistance activities into a single
organization, it is not clear that existing services are
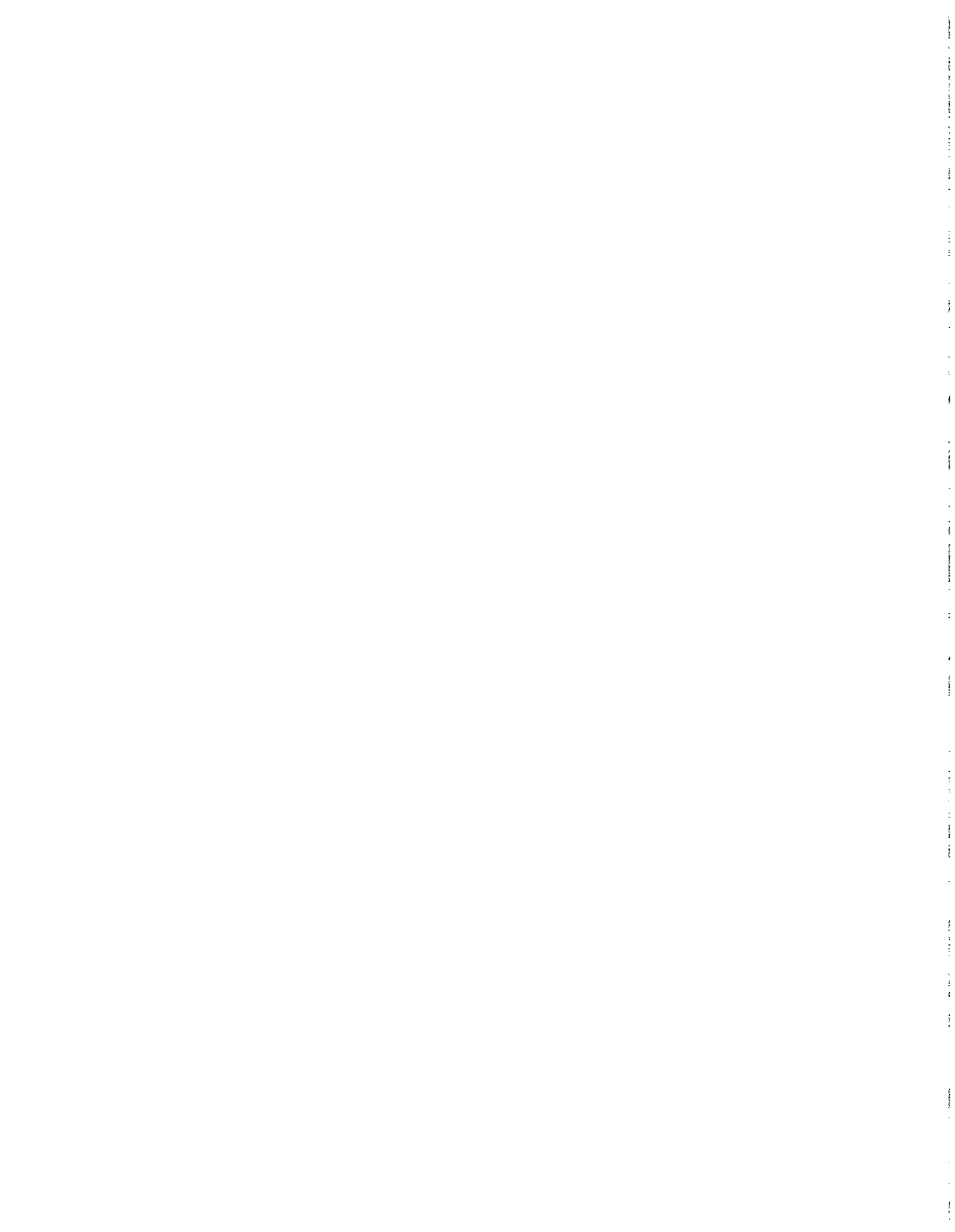inadequate.

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Furthermore, we have two concerns about establishing a single assistance organization. First, P.L. 89-306 establishes that the Secretary of Commerce shall provide agencies with scientific and technological advisory services. Establishment and placement of an advisory service in GSA would either duplicate this existing function or require a legislative change. Our second concern is that the establishment of a single, comprehensive assistance organization would place the government in direct competition with the private sector. We are not convinced that the benefits of a single organization outweigh our policy to rely on the private sector for goods and services. Criticism of existing assistance activities may be a function of the level of resources, rather than organizational assignment. We would appreciate your analysis of the benefits of a single organization and the resource and staffing level you are recommending.

Sincerely,

Jim J. Tozzi
Assistant Director for
Regulatory and Information Policy

(913340)