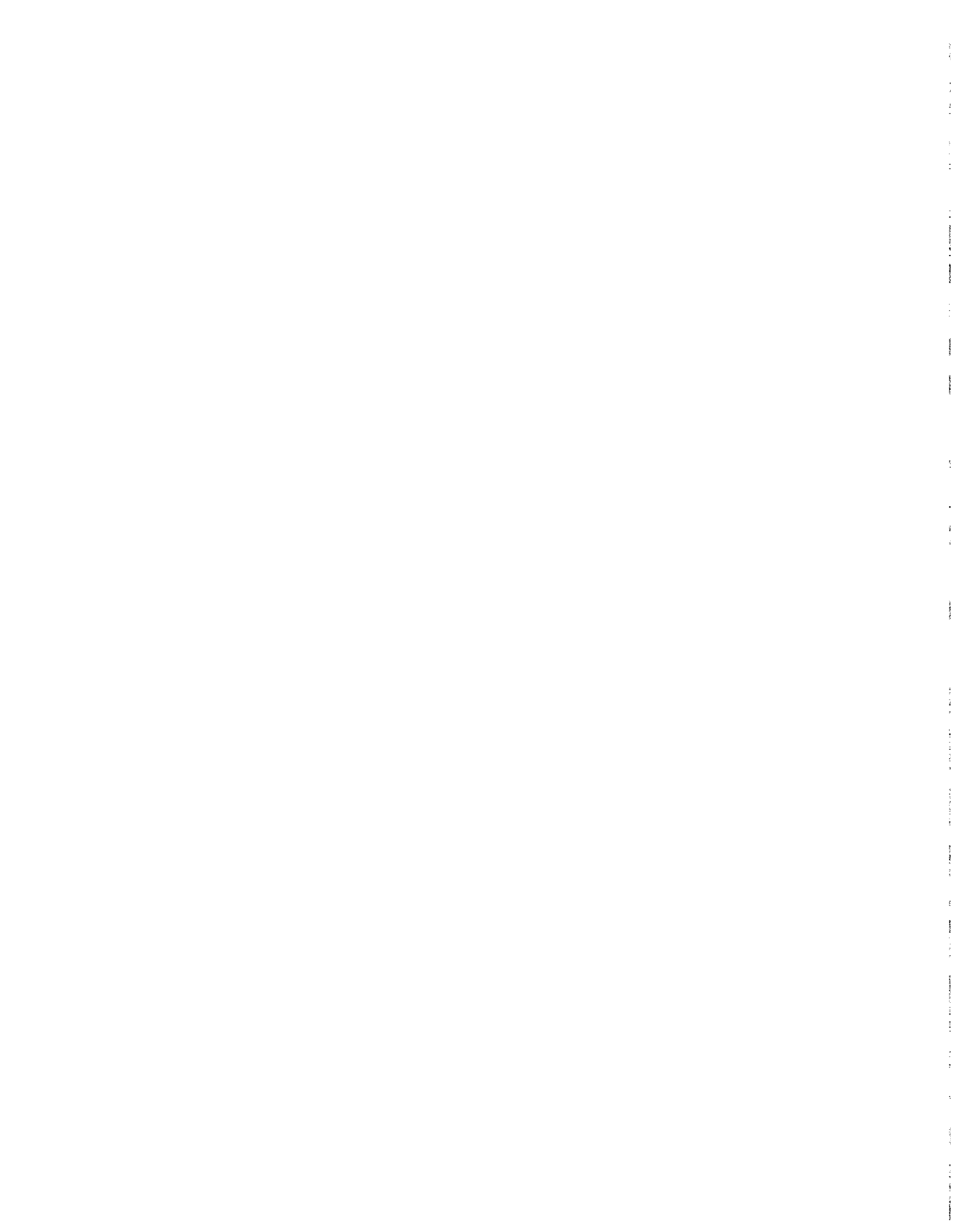


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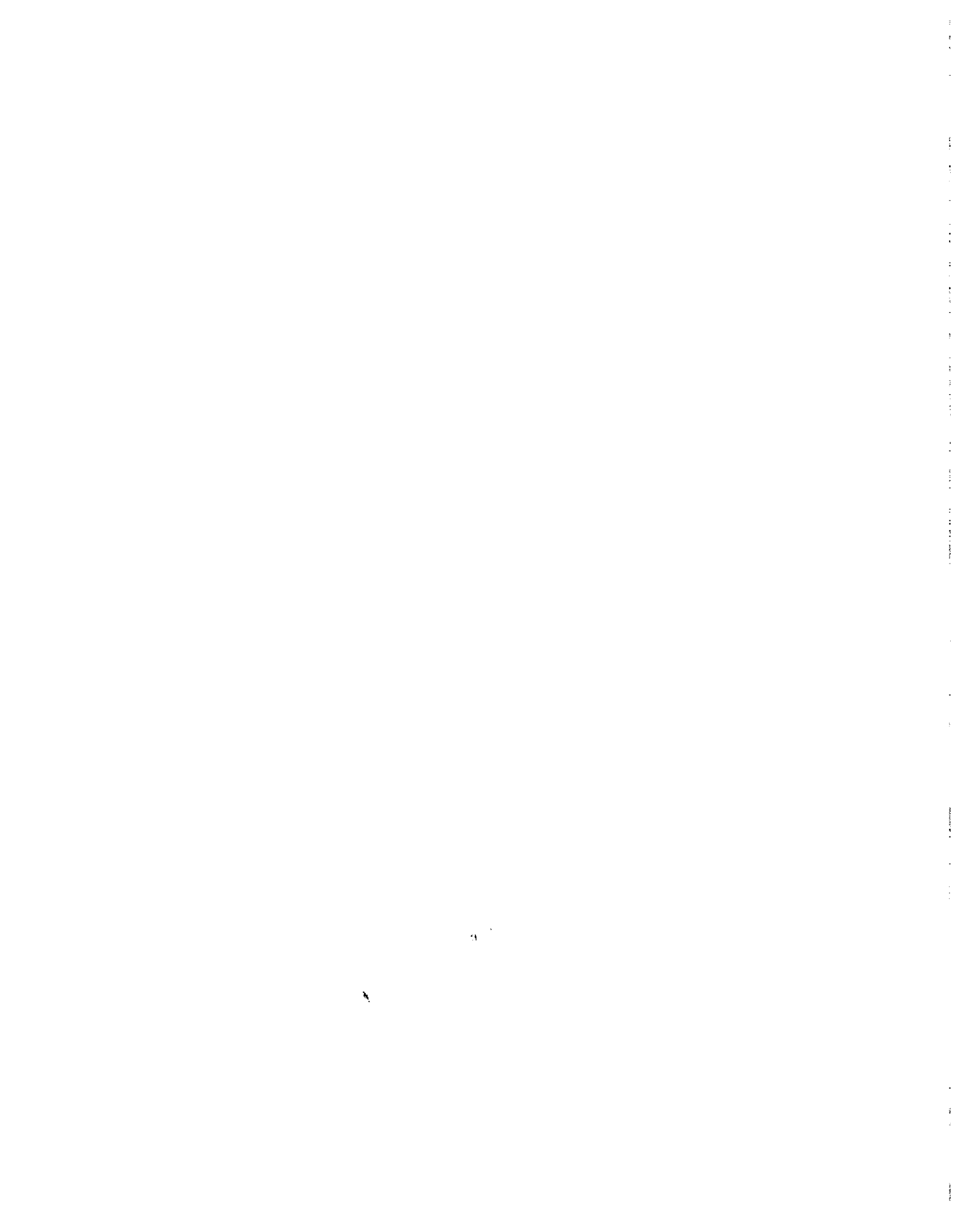


QUESTIONS DESIGNED TO AID  
MANAGERS AND AUDITORS IN ASSESSING  
THE ADP PLANNING PROCESS

SEPTEMBER 30, 1982

Prepared by  
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ACCOUNTING AND FINANCIAL  
MANAGEMENT DIVISION

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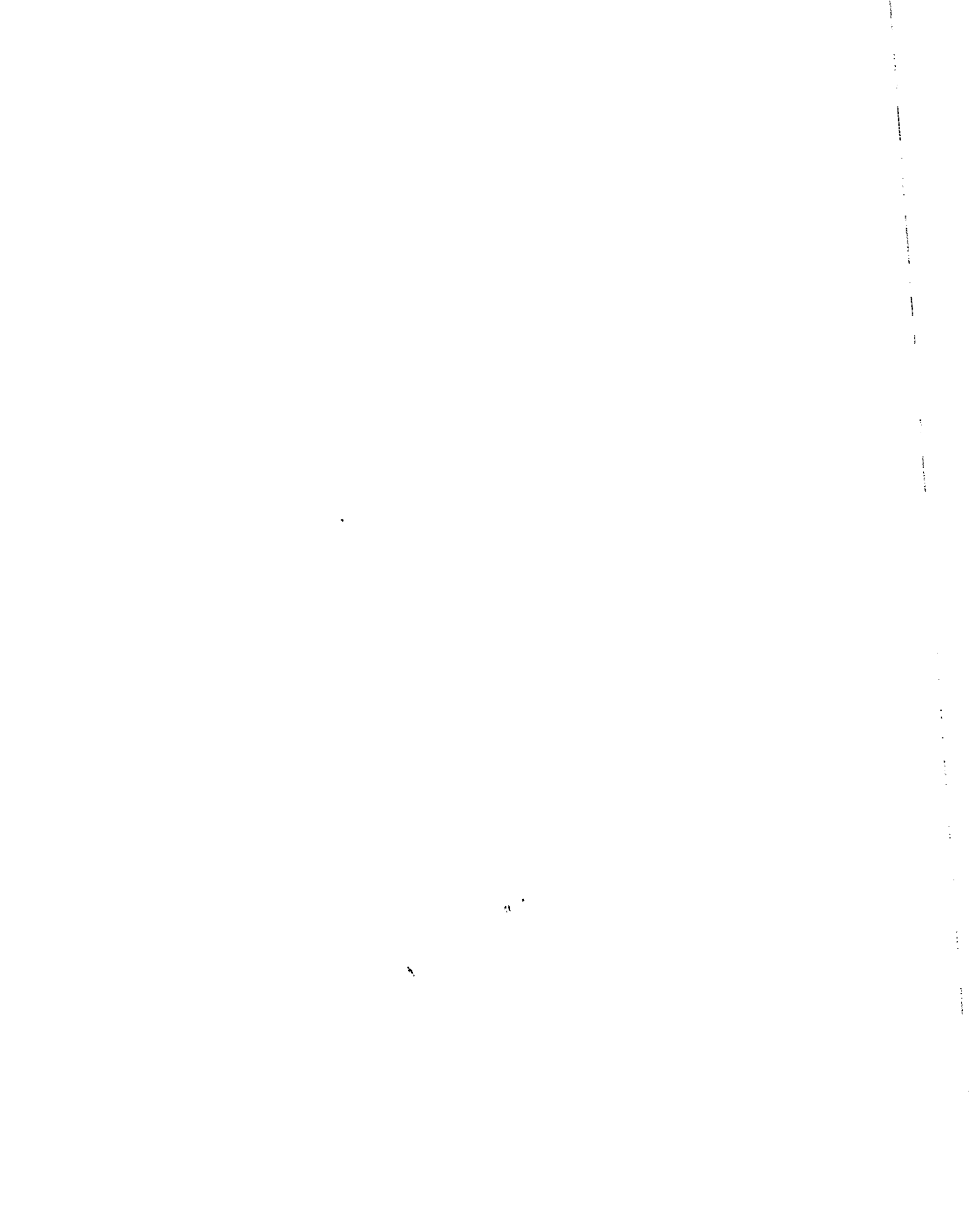
The contents of this publication were compiled by the GAO staff that performs reviews of the management of planning for Automatic Data Processing Systems (ADP). It contains the results of their research in this area and a synthesis of the experience gained in assignments over the past 8 years. It identifies and amplifies in question and answer format approximately 58 elements which are considered essential to the operation of an effective ADP planning process. By comparing the actual management of ADP planning with these elements (or criteria) an assessment can be developed of the quality of the planning process. Such an assessment can be useful to auditors working in this area. But just as important it can be used as a self evaluation tool by those responsible for managing ADP resources. An explanation of the format is presented in the introduction.

Overall, the criteria in this publication represent idealized performance objectives. For example, no organization will meet all the criteria exactly as they are presented in this publication. In many cases substitute procedures, abbreviated measures or other approaches would be equally as effective. An ability to recognize such substitutions and sufficient understanding about this area to make confident judgments about their effectiveness are essential for anyone who would use this publication.

Since being issued as an exposure draft in August 1979, this publication has been used effectively by GAO auditors and many others, including those at management levels of Federal agencies. Changes from the original draft were prompted primarily by the excellent feedback received from both the public and private sectors. Any further comments or questions should be directed to George P. Sotos, U.S. General Accounting Office, Accounting and Financial Management Division, Room 6011, 441 G Street, N.W., Washington, D.C. 20548. The telephone number is (202) 275-5040.

Sincerely yours,

  
W. L. Anderson  
Senior Associate Director



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## INTRODUCTION

### BACKGROUND

This publication was prepared by the Automatic Data Processing Group, Financial and General Management Studies Division, U. S. General Accounting Office (GAO). The need for a publication of this type was recognized by the GAO staff as a result of over 42 reviews during the past 15 years where the management of ADP planning was found to be inadequate. For example, during hearings before a Subcommittee on Government Operations, House of Representatives, in September 1976, the lack of effective ADP planning was cited as a major cause for noncompetitive procurements of ADP systems in the Federal Government. Also, in one instance, GAO reported in 1975 that an agency spent \$7.7 million in developing and implementing several management information systems over a 9 year period without one becoming fully operational. We attribute both of these type situations, in large part, to deficiencies in the ADP planning process.

### OBJECTIVE

The primary objective in the development of this publication was to assist experienced ADP auditors to plan and perform reviews of the management of ADP planning in Federal agencies.

A secondary objective was to make it useful to all levels of management that have responsibility for managing ADP-related resources or that are dependent upon the support provided by ADP systems.

#### CONTENTS

This publication cites 58 elements considered essential to good ADP planning. Identified from research in the literature and from the results of GAO reviews of Federal agencies, these essential elements have been amplified into specific criteria which can be used as a reference base for evaluating the management of the ADP planning process. This has been done by use of a question and answer format as explained below.

#### THE FORMAT

The ADP planning process has been divided into 5 major subject areas and a chapter is devoted to each.

They are:

1. Organizational involvement
2. Direction
3. Structure
4. Control, and
5. Reporting

In each chapter the essential elements for that subject are identified by a two digit number, e.g.,

### 1.3 Establish an Executive Management Committee --

(This example is from page 9.)

Each essential element (two digit number) is then amplified by a series of questions identified by three and four digit numbers, e.g.,

1.3.1 Has an executive management (or steering) committee been established? \_\_\_\_\_ (see page 10)

#### HOW IT SHOULD BE USED <sup>1/</sup>

There are over 370 questions in this pamphlet and selecting those that will be useful requires some thoughtful analysis of the problem area. Based on our experience one useful method is to:

- 1) Document, at as detailed a level as possible, the objectives and subobjectives of the review.
- 2) Examine all the questions and select only those whose answers will contribute to achievement of the objectives and subobjectives.
- 3) Bear in mind that the higher the number of unanswered questions and/or vague, imprecise answers, the greater the probability of a serious management problem.

The more carefully the objectives and the relevant sub-objectives are developed, the easier it is to select and bring to an appropriate minimum the number of criteria used from this reference. However, when the objectives are general, a larger number of criteria can be used to develop an understanding of the different aspects of the overall management of the ADP planning process.

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<sup>1/</sup>Appendix III, pages 86-93, contains 4 examples of how this pamphlet can be used by both managers and auditors.

## RECORDING ANSWERS TO THE QUESTIONS

Suggested symbols for recording answers to the questions are provided below. By entering such symbols and other information adjacent to the question the pages can serve as both part of an audit plan and the work papers.

<u>SYMBOLS</u>	<u>MEANING OF SYMBOL</u>
S	The task is being performed (or the action indicated is being taken) in a satisfactory manner.
U	The task is being performed (or the action indicated is being taken) but the result appears unsatisfactory.
NP	The task (or action) is considered necessary but is not being performed.
NA	The task (or action) is considered not applicable for the particular criteria.

In general a "U" and/or "NP" answer is an indication that further analysis is required. With few exceptions, the greater the number of "U" or "NP" answers (to the questions) the more serious are the management problems.

## AN EXAMPLE OF ITS USE FOR SELF EVALUATION

Management can select several elements from the table of contents about which it does not have sufficient information. The questions under these elements can then be directed to the person responsible for that area. For example, the following questions might be useful to a manager who must make decisions on whether ADP systems are to be acquired

- 1.2.2.9 Are ... cost benefit forecasts developed?
- 1.3.4 Does an ADP steering committee review ...  
the long-range plan .... ?
- 1.5.1 Is there a central planning group responsible for producing an integrated (agency-wide) ADP plan?
- 1.8.1 .... are costs attributable to each major organizational unit shown ....?

If the answers are "U" or "NP" for most questions, then management is aware that it has a problem that requires further attention.

## OTHER USES

It might be worthwhile to select a number of elements about a particular subject and repackage that information for easier use by senior managers and others. Several examples of such repackaging might include:

- a. A compilation of the key elements that top management should be aware of before approving procurement of a computer system.
- b. A summary of specific elements which should be included in the ADP plan itself.
- c. A summary of some of the elements that should be covered in the organization's policies on the management of ADP planning (see appendix III).
- d. A summary of the criteria that can be used to help evaluate the completeness of the ADP planning process (see appendix III).

This pamphlet is not designed to follow the flow of the ADP planning process and should not be used for that purpose without extensive repackaging (similar to appendix III) and addition of individual organization planning requirements. Also, while it is intended to help in reviews of the planning process for organizations with large ADP systems, the management principles which form the bases for the questions make it relevant for organizations with small systems. In the latter case a much smaller number of questions would be used.

#### VALIDITY OF THE ESSENTIAL ELEMENTS

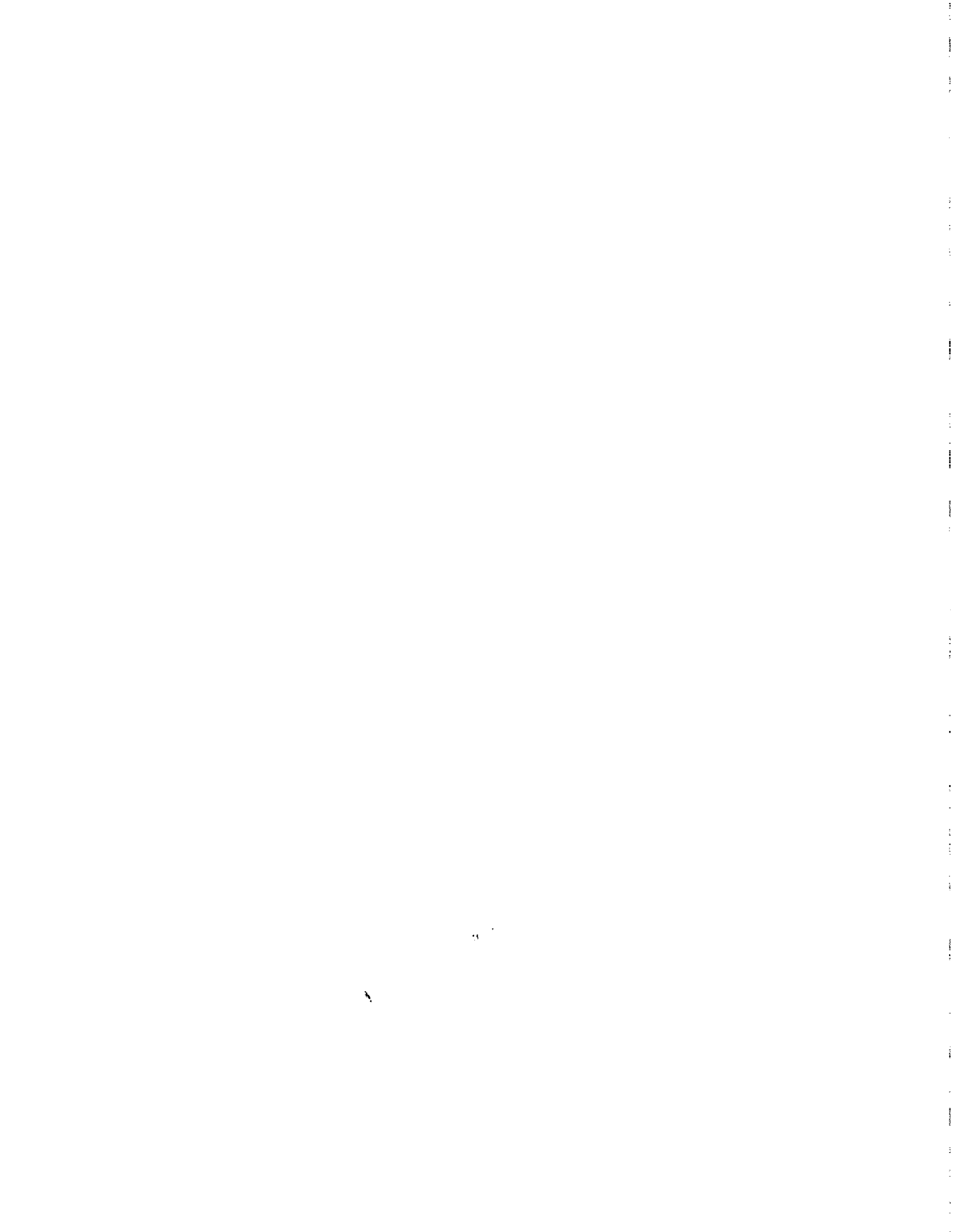
The essential elements were developed as a result of experiences gained by the GAO in reviews over the past 8 years. They are also consistent with much of the current literature on the subject of corporate and government plan-



ning. The only new aspect is the packaging of this information for use as evaluation criteria in the specific area of the management of the ADP planning process. Different sections have been tested in recent audits of Federal agencies and found to be useful both as an audit tool and as a means of communicating with agency management.

#### SOME CAUTIONS ON THE USE OF THIS PUBLICATION

These criteria represent idealized performance objectives. For example, no organization will meet all the criteria exactly as they are presented in this publication. In many cases substitute procedures, abbreviated measures or other approaches would be equally as effective as those identified in this document. An ability to recognize such substitutions and sufficient understanding about this area to make confident judgments about their effectiveness are essential for anyone who would use this publication.



## 1. ORGANIZATIONAL INVOLVEMENT

Some degree of active involvement in plan formulation is essential for all levels of an organization that might be affected when the plans are carried out. For ADP planning it is critical that this active involvement be formalized and made visible at three key organizational levels; i.e., top management, data processing management, and user management. By the top management level we mean the Department or Agency head and officials down to and including the heads of major units such as bureaus and/or operating divisions. By user management we mean the senior line and staff officials for whom the computer support is provided. In some instances these senior users may also be members of top management.

Evidence of this formalized involvement at each of these levels should be routinely conspicuous and well communicated within the organization. The form of that evidence and its substance are both important. In this section the essential elements of the substance of that involvement for top management, data processing management, and user management are identified.

### 1.1 Establish Responsibility and Accountability For ADP Plans

Through written policies and guidelines the agency head should establish responsibilities and accountability for ADP planning.

1.1.1 Are senior managers of each major organizational unit required to

- o participate in the planning? \_\_\_\_\_
- o define their long-range ADP requirements \_\_\_\_\_

**1.2 Hold Functional Managers Responsible for Strategy in ADP Plans**

Require that the head of each major organizational unit be responsible and held accountable for the decisions affecting his unit which are included in the strategy for achieving the ADP objectives.

Do senior managers of each major organizational unit require that those subordinate managers who use ADP output participate in long-range ADP planning? \_\_\_\_\_

1.2.2 Are subordinate managers held accountable for the determination, justification, and long-range planning of their ADP requirements? \_\_\_\_\_

1.2.2.1 Are these subordinate managers required to confirm the value of the existing ADP support they receive in terms of its contribution to performance of their functional tasks? \_\_\_\_\_

1.2.2.2 Does the record show that systems' costs were allocated to each user? \_\_\_\_\_

1.2.2.3 Are these subordinate managers instructed to justify their long-range ADP requirements in terms of payoff contribution made to the functions for which they are responsible? \_\_\_\_\_

1.2.2.4 Are these subordinate managers instructed to show the gap between existing procedures and required ADP support? \_\_\_\_\_

- 1.2.2.5 Are these subordinate managers required to use quantitative terms to identify the performance criteria which, when achieved, will close the gap? \_\_\_\_\_
- 1.2.2.6 Was an estimated cost considered by these subordinate managers when they inserted the ADP requirement into the long-range ADP plan? \_\_\_\_\_
- 1.2.2.7 Was this estimated cost based on a life cycle projection for the system that would satisfy the requirement? \_\_\_\_\_
- 1.2.2.8 Are subordinate managers held accountable when computer systems developed for their support fall short of expected performance? For example, do they sign off on performance evaluation tests? \_\_\_\_\_
- 1.2.2.9 Are these subordinate managers required to evaluate and take a position on cost benefit forecasts of ADP systems being developed for their support? \_\_\_\_\_

1.3 Establish an Executive Management Committee

A formal executive management (or steering) committee consisting of senior management from every major organizational unit should be established and held responsible for assessing the consolidation and integration of the functional, technical and financial aspects of ADP. The committee objectives are to assist the agency head in management of organization-wide ADP resources and to insure that all viewpoints are considered. Its decision authority, if any, flows directly from the agency head to the chairperson of this committee.

1.3.1 Has an executive management (or steering) committee been established? (We will use the term steering committee). \_\_\_\_\_

1.3.1.1 Is there a formal charter (set of instructions) issued by the agency head which describes the responsibilities, authority, and duties of the steering committee? \_\_\_\_\_

1.3.1.2 Does the charter require the chairman of the steering committee to report results of the committee's work directly to the agency head or deputy? \_\_\_\_\_

1.3.1.3 Does the charter require that the steering committee disagreements be presented to the agency head or deputy for a decision? \_\_\_\_\_

1.3.2 Does the charter also establish a working group for the steering committee whose duties are to research the issues, perform intraorganizational coordination and other preparatory work supportive to the steering committee?

1.3.2.1 Does each member of the steering committee have a representative on the steering committee working group? \_\_\_\_\_

1.3.3 Are the members of the steering committee also members of the central planning group (mentioned in 1.4.1 below)? \_\_\_\_\_

1.3.3.1 Are the members of the steering committee working group also members of the central planning group? \_\_\_\_\_

1.3.4 Is the ADP steering committee required to review approve, and/or indicate disagreement with the long-range ADP plan produced by the central planning group? \_\_\_\_\_

1.4 Establish a Central Planning Group

This group should be established at the same level as other top agency planners. It should include representation from each major user as well as the data processing unit and its completed work should be submitted to the agency head through the steering committee. The illustration of the ADP planning process on page 15 shows the organizational location of a central planning group.

1.4.1 Has the authority and responsibility of a central planning group been established by a written charter or set of instructions signed by the agency head or deputy? \_\_\_\_\_

1.4.2 Does the central planning group contain representatives from each major organizational unit in the agency? \_\_\_\_\_

1.4.3 Where there is no ADP central planning group or ADP steering committee is there an ADP planning or coordinating group with similar responsibilities that reports to the agency head or deputy? \_\_\_\_\_

1.4.4 Do the written duties and responsibilities of the members of the central planning group require them to produce planning products for which they can be held accountable? \_\_\_\_\_

1.5 Provide Directives for Integration of ADP Systems

The central planning group should be held responsible and accountable for integration of ADP systems across departmental lines of authority. \*

- 1.5.1 Do the written duties of the central planning group require that it produce an agency-wide integrated long-range ADP plan for approval by the agency head or the steering committee? \_\_\_\_\_
- 1.5.2 Is the central planning group required to review all ADP plans and assess the potential for integration of ADP systems across the entire agency? \_\_\_\_\_
- 1.5.2.1 Does the central planning group analyze and assess for overlap and integration potential each organizational unit's existing ADP
- o support applications? \_\_\_\_\_
  - o long-range objectives and sub-objectives? \_\_\_\_\_
  - o expected performance criteria? \_\_\_\_\_
  - o support problems? \_\_\_\_\_
  - o proposed new opportunities? \_\_\_\_\_
  - o potential for systems integration? \_\_\_\_\_
- 1.5.3 Is the central planning group required to document the results of its assessments? \_\_\_\_\_

---

\*See also items 2.8 and 2.9 for more duties that should be performed by a central planning group.



1.5.3.1 Does the head of each major functional unit coordinate on the system recommendations made by the central planning group? \_\_\_\_\_

1.5.4 Do the results of the central planning group studies substantially influence the system design concepts and the technical design of the system? \_\_\_\_\_

1.6 Assess the Tradeoffs Between Risks and Potential Payoff

The central planning group should be held responsible and accountable for identifying and assessing the organization-wide risks and value to the agency of the potential payoff of the total ADP investment.

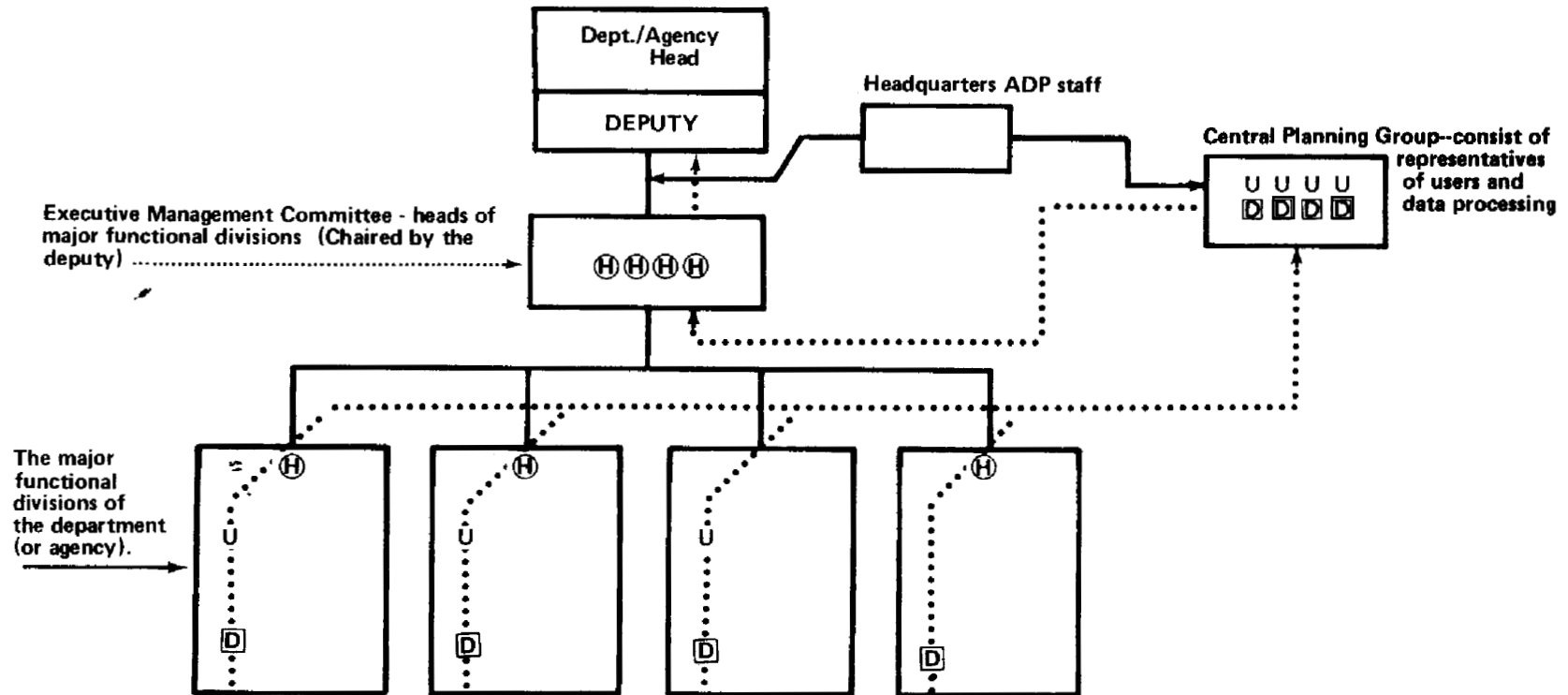
1.6.1 For each objective and/or sub-objective in the ADP plan, is there an accompanying statement of the performance criteria expected when the objectives or sub-objectives are achieved? \_\_\_\_\_

1.6.2 Does a central planning group determine whether the objectives and sub-objectives in all ADP plans contain sufficient quantitative performance criteria to be used in a cost benefit analysis? \_\_\_\_\_

1.6.3 Where such performance criteria are not included with the objectives or sub-objectives, is there some other basis in the planning documentation which communicates how achievement of the objectives will be recognized? \_\_\_\_\_

- 1.6.4 Are the performance criteria which describe how the achievement of objectives will be recognized, presented in quantitative terms? \_\_\_\_\_
- 1.6.5 Can the gap between existing and planned capabilities be identified from the record? \_\_\_\_\_
  - 1.6.5.1 Has a central planning group focused on those gaps as a means of identifying what the planned investment in ADP resources will buy? \_\_\_\_\_
  - 1.6.5.2 Has a central planning group reviewed the impact of this gap, or series of gaps, in ADP capabilities and reported in writing its assessment and recommendations to the agency head? \_\_\_\_\_
- 1.6.6 Is the central planning group required to identify to the agency head those ADP applications which
  - o have high technical risks? \_\_\_\_\_
  - o have high operational risks? \_\_\_\_\_
- 1.6.7 Is the central planning group required to establish a quantitative mission "payoff" ranking for each ADP application contained in the long-range plan? \_\_\_\_\_
- 1.6.8 Is the manager of each major unit required to coordinate, or dissent, with the mission payoff assessment identified by the central planning group? \_\_\_\_\_
- 1.6.9 Is the central planning group held accountable for the quality of the plans it produces?
  - 1.6.9.1 Does the central planning group sign off on the performance evaluation test of each major system covered in the plan? \_\_\_\_\_
  - 1.6.9.2 Does the central planning group document a comparison between plan estimates and actual performance observed in the performance evaluation tests? \_\_\_\_\_

## AN ADP PLANNING PROCESS



**Explanation :**

H = The head of a major functional division of a department (or agency).

U = Represents the users within each major functional division who receive support from the ADP operation.

D = The data processing organization within each major functional division and on the headquarters staff (Note: May Not Be Used In All Divisions).

The dotted line . . . . . represents the flow of the ADP planning process - from the users and the data processing organizations through the major unit head to the Central Planning Group. The Central Planning Group, supported by the Headquarters ADP staff, reviews, evaluates, consolidates and integrates the separate plans from the organizational units into an organization wide plan. This plan is then presented to the Department Head (Agency head) through the Executive Committee.

1.7 Develop a Financial Forecast

The central planning group should develop an agency-wide coordinated financial forecast of the overall costs of all ADP resources for each year over the life of the long-range plan.

1.7.1 Has each major unit manager been required to include in his/her long-range ADP plan a list of those ADP applications which he/she uses but which provide unsatisfactory support or which have only a marginal payoff to the efficiency, effectiveness and economy of operations? \_\_\_\_\_

1.7.1.1 Are the unsatisfactory or marginal support capabilities identified in quantitative terms? \_\_\_\_\_

1.7.2 Is each functional manager required to list in his/her long-range ADP plan those ADP applications which provide satisfactory support? \_\_\_\_\_

1.7.3 Is each functional manager required to identify those existing applications whose modification and/or enhancement would increase the efficiency, economy, and effectiveness of operations? \_\_\_\_\_

1.7.3.1 Is there a requirement to describe these modifications and/or enhancements in quantitative terms? \_\_\_\_\_

1.7.4 Is there a requirement that functional managers identify new ADP capabilities that will increase the effectiveness of their operations? \_\_\_\_\_

- 1.7.4.1 Are these new requirements for ADP support identified in quantitative terms? \_\_\_\_\_
- 1.7.5 Has the head of each organizational unit prepared a list of ADP applications available from an external source that would result in increased productivity or has some other "pay off" if acquired; i.e.
  - o from another Government agency? \_\_\_\_\_
  - o from a commercial vendor? \_\_\_\_\_

1.8 Review the Financial Forecast

The agency head should review the financial forecast and formalize, in writing, his/her investment decisions and the priorities.

- 1.8.1 For each year of the plan, does the financial forecast show the costs attributable to each major organizational unit of the agency? \_\_\_\_\_
- 1.8.2 For each year of the plan, does the financial forecast show the costs of the ADP operation by major systems components, such as:
  - o hardware? \_\_\_\_\_
  - o system software? \_\_\_\_\_
  - o application software? \_\_\_\_\_
  - o peripherals? \_\_\_\_\_
  - o communications? \_\_\_\_\_
  - o other relevant components? \_\_\_\_\_

- 1.8.3 Are the costs shown in a consistent format from year to year? \_\_\_\_\_
- 1.8.4 Are cost trends shown? \_\_\_\_\_
- 1.8.5 Is the priority shown for each application along with its annual and total cumulative life cycle estimate? \_\_\_\_\_

1.9 Require Accountability for ADP Investments

The senior manager of each organizational unit that receives or provides ADP support should be formally assigned, in writing, the responsibility and accountability for investment decisions made as a result of his/her stated ADP support requirements and recommendations.

- 1.9.1 Does the record show that the agency head reviewed and approved
  - o the financial forecast contained in the long-range plan? (\*1.8) \_\_\_\_\_
  - o the priority of resource investments contained in the long-range plan? \_\_\_\_\_

1.10 Establish Agency Head Decision Points

Key phases (or milestones) such as those in the life cycle of each software application, system,

---

(\*1.8) Question is similar and is repeated here to provide stand alone answers for this section.

and hardware system, should be established in the plan as decision points where the agency head personally makes the decision to continue to the next phase.

1.10.1 Does the agency head have a regularly scheduled review of the "expected" performance against "actual" performance contained in the ADP plan? \_\_\_\_\_

1.10.1.1 Does the record show decisions made by the agency head as a result of these reviews? \_\_\_\_\_

1.10.2 Are shortfalls between planned performance and actual performance identified on a system basis? \_\_\_\_\_

1.10.2.1 Are the reasons for the deficiencies, if any, made visible in the record? \_\_\_\_\_

1.10.3 Is there a standard set of decision points by which the actual performance against planned performance is followed? \_\_\_\_\_

(This can be milestones such as those in the life cycle of a software application system).

1.10.3.1 Does the record show adequate communications and understanding of these milestones? \_\_\_\_\_

## 2. DIRECTION

Specific direction and guidance must be provided throughout the ADP planning process to achieve consistent and effective plans. This direction is obtained from the organization's mission requirements. From the requirements, goals and objectives are established and a coordinated strategy for achieving them is developed and included in the plan. Policies and procedures are formalized in writing to assure that the strategy is communicated and direction provided to those who carry out the plan.

### 2.1 Identify the Agency Mission

ADP plans prepared by the head of each organizational unit and the central planning group (see pages 14 and 18) should identify the agency missions or goals contained in statutory and agency policy documents.

2.1.1 Is the agency mission, or its goals, available as a written document? \_\_\_\_\_

(NOTE: OMB A-113 §3.6 uses missions and goals to mean the same thing.)

### 2.2 Identify Long-Range Agency Programs

Long-range agency programs which provide the basis for ADP support requirements should be identified and described.

(NOTE: These are not ADP plans but they provide



the goals for ADP plans.)

- 2.2.1 Is there documentation which describes the plans to achieve the agency program goals? \_\_\_\_\_
- 2.2.1.1 Does this documentation contain the short- and long-range objectives to be achieved for each program? \_\_\_\_\_
- 2.2.1.2 Is there sufficient quantitative or other explicit information contained in the statement of the program objectives (2.2.1.1) to provide effective criteria for assessing when objectives are actually achieved? \_\_\_\_\_
- 2.2.2 Is there written documentation that shows that the head of each organizational unit does assess trends for impact on his/her unit's functional tasks; i.e.,
- o political trends? \_\_\_\_\_
  - o technical trends? \_\_\_\_\_
  - o social trends? \_\_\_\_\_
  - o work trends? \_\_\_\_\_
- 2.2.2.1 Based on the type of assessment, are factors or assumptions developed which influence the content of long-range ADP objectives? \_\_\_\_\_
- 2.2.3 Are assumptions included as an integral part of the agency's long-range ADP plan? \_\_\_\_\_
- 2.2.3.1 Is there any evidence that the agency head reviewed the ADP planning assumptions and approved them? \_\_\_\_\_

## 2.3 Translate Program Objectives into ADP Goals

The agency programs should be translated into ADP sub-goals which support achievement of individual program objectives and these should be documented.

2.3.1 Is there documentation which shows the ADP goals that support achievement of agency programs? \_\_\_\_\_

2.3.1.1 Are the ADP goals stated quantitatively? \_\_\_\_\_

## 2.4 Identify the Strategy for Achieving ADP Goals

The plan should contain a strategy or series of decisions which indicate how the ADP goals are to be achieved.

2.4.1 Is there documentation for an ADP strategy to accomplish each ADP goal; i.e., a set of decisions which have been made? \_\_\_\_\_

2.4.1.1 Does this strategy contain long-range objectives? \_\_\_\_\_

2.4.1.2 Are these long-range objectives stated quantitatively? \_\_\_\_\_

2.4.1.3 Do the long-range objectives provide a guide for the investment of ADP resources? \_\_\_\_\_

2.4.1.4 Does the strategy contain quantitatively stated short-range objectives? \_\_\_\_\_

## 2.5 Establish the Scope of Centralized Authority

There should be a clear policy expression of the authority, responsibility, and accountability for ADP resources. This should cover control of planning, design, development, operations, and compliance with internal and external regulations relevant to ADP. It should specifically establish the degree to which such control is or is not centralized in the agency headquarters.

- 2.5.1 Is there policy documentation concerning
  - 2.5.1.1 internal organization authority to spend ADP funds? \_\_\_\_\_
  - 2.5.1.2 responsibility for ADP resource use? \_\_\_\_\_
  - 2.5.1.3 accountability for ADP resource investment results? \_\_\_\_\_
- 2.5.2 Is there documentation which assigns responsibility and accountability for
  - 2.5.2.1 planning the use of ADP resources? \_\_\_\_\_
  - 2.5.2.2 design of ADP systems? \_\_\_\_\_
  - 2.5.2.3 development of ADP systems? \_\_\_\_\_
  - 2.5.2.4 operational performance of ADP systems? \_\_\_\_\_
  - 2.5.2.5 a system of internal controls? \_\_\_\_\_
  - 2.5.2.6 security and contingency plans? \_\_\_\_\_
  - 2.5.2.7 compliance with internal policies? \_\_\_\_\_

2.5.3 Does this documentation establish the degree to which control is centralized in the agency headquarters? \_\_\_\_\_

2.6 Require Accountability for Approval of ADP Requirements

Accountability for cost effective use of ADP applications is that of the senior manager who approved the requirement for that support. This should be established as a matter of written policy. (\*1.9)

2.6.1 Is there documentation which assigns authority for approval of ADP requirements? \_\_\_\_\_

2.6.2 Does this documentation require that estimated cost figures accompany the ADP requirements request or otherwise be known before the requirement is approved? \_\_\_\_\_

2.6.3 Are there provisions to hold the approving official(s) accountable for the payoff of resource investment? \_\_\_\_\_

(I.e., are there start, finish, and use milestones or checkpoints where the signature or initials of the approving official(s) are **required** as his/her acknowledgement of control, feedback, status, and payoff?)

2.6.3.1 Are ~~these~~ documented procedures for certifying that milestones or checkpoints have been reached? \_\_\_\_\_

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(\*1.9) Question is similar but are repeated here to provide stand alone answers for this section.

## 2.7 Assign Priorities for ADP Requirements

There should be an established procedure to assign priorities for ADP requirements. This procedure should be consistent with the agency head's investment priorities. (\*1.8)

2.7.1 Is there a documented procedure which requires establishment of priorities for the investment of ADP resources? \_\_\_\_\_

2.7.2 Is the actual setting of ADP investment priorities consistent with the procedures set by the agency head? \_\_\_\_\_

## 2.8 Consolidate Long-Range ADP Plans

The central ADP planning group should consolidate long-range ADP plans developed by the functional managers and prepare an agency-wide ADP plan. This group should determine whether the plans contain sufficient quantitative measures for use in cost benefit analyses.

2.8.1 Is there a written directive establishing a central planning group for ADP long-range plans? (\*1.5.1) \_\_\_\_\_

2.8.2 Is a central planning group tasked to consolidate all long-range ADP plans developed by functional managers and prepare an agency-wide ADP plan? \_\_\_\_\_

---

(\*1.5.1) Questions are similar but are repeated here to  
(\*1.8) provide stand alone answers for this section.

- 2.8.3 Has a central planning group been assigned to determine whether the ADP long-range objectives proposed in functional manager (department) plans are consistent with agency mission objectives? \_\_\_\_\_
- 2.8.3 Has a central planning group been assigned to determine whether the objectives and sub-objectives in functional manager's ADP plans contain sufficient quantitative performance criteria to be used in a cost benefit analysis? \_\_\_\_\_
- 2.8.5 Has a central planning group been assigned to report to the agency head its findings on each item listed above? \_\_\_\_\_

2.9 Identify ADP Investment Risks

The central planning group should document ADP investment risks which require agency head attention. These can be identified by a lack of quantitative criteria and vague linkage between ADP sub-objectives and agency mission objectives. (\*1.6)

- 2.9.1 Is the central planning group required to identify to the agency head
    - 2.9.1.1 Those ADP applications which
      - o have high technical risks? \_\_\_\_\_
      - o have high operational risks? \_\_\_\_\_
- (\*1.6.6)

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(\*1.6) Questions are similar but are repeated here to provide (\*1.6.6) stand alone answers for this section.

- 2.9.1.2 Those having cost benefit analyses that are primarily non-quantitative. \_\_\_\_\_
- 2.9.1.3 Those containing a new hardware configuration, operating system, data base management system, or computer language for which the present in-house staff is untrained. \_\_\_\_\_
- 2.9.1.4 Those for which the input volume has not been identified. \_\_\_\_\_
- 2.9.1.5 Those which are being developed for the first time (by either a vendor or the in-house staff). \_\_\_\_\_
- 2.9.1.6 Those whose expected output can not be traced to a visible and worthwhile improvement in a mission oriented task. \_\_\_\_\_
- 2.9.1.7 Those for which no user is identified as having primary accountability. \_\_\_\_\_
- 2.9.2 Is the central planning group required to establish a quantitative mission "payoff" ranking for each ADP application contained in the long range ADP plan? \_\_\_\_\_





2.9.3 Is the head of each major functional unit required to concur, or dissent, with the mission payoff assessment identified by the central planning group? (\*1.6.8) \_\_\_\_\_

2.10 Require Supporting ADP Strategies

The head of each major organizational unit should summarize the key decisions that form the basis of the long-range ADP plans for his/her organizational unit. These decisions, or assumed decisions, should also be included in the long-range plan in an appropriate chronological sequence.

2.10.1 Is publication of an ADP strategy required as part of, or associated with, the long-range ADP plan? \_\_\_\_\_

2.10.2 Does the ADP strategy consolidate the long-range objectives proposed by the heads of the different major functional units? \_\_\_\_\_

2.10.3 Does the ADP strategy identify the performance gap which the investment in ADP resources is intended to overcome? (\*1.6.5) \_\_\_\_\_

---

(\*1.6.5) Questions are similar but are repeated here to provide stand alone answers for this section.  
(\*1.6.8)

- 2.10.4 Is there a quantitative expression of the payoff to mission performance that will be purchased by the ADP resource investments in the long-range ADP plan? (\*1.6.7) \_\_\_\_\_
- 2.10.5 Is there a requirement for the ADP strategy to contain an investment priority ranking for the ADP applications listed in the long-range ADP plans? \_\_\_\_\_
- 2.10.6 Is there a requirement for the manager of each major functional unit to coordinate on the priority ranking submitted to the agency head for signature? \_\_\_\_\_
- 2.10.7 Is there a requirement for the agency head to indicate his/her written approval of the decisions contained in the strategy document? \_\_\_\_\_

2.11 Assign Responsibility for Carrying out the Plan

Responsibility and accountability for carrying out the plan should normally be along the lines of organizational authority. When a steering committee and/or a project manager team is used, their authority and responsibility should be published under the agency head's signature.

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(\*1.6.7) Question is similar but is repeated here to provide stand alone answers for this section.

- 2.11.1 Is there a set of documents which indicate that the individual responsible for carrying out the plan is aware of his/her responsibilities and authority? \_\_\_\_\_
- 2.11.2 Does the record show that the organizational unit managers have been informed concerning the responsibility and authority of those carrying out the plan? \_\_\_\_\_
- 2.11.3 Does the record show any confusion or lack of authoritative direction in the carrying out of the plan? \_\_\_\_\_
- 2.11.4 Is there documentation which assigns responsibility and accountability for maintaining the written planning regulations, instructions, and guidelines up-to-date? \_\_\_\_\_
  - 2.11.4.1 Is there a senior official, who reports directly to the agency head in the headquarters staff, assigned this responsibility? \_\_\_\_\_
  - 2.11.4.2 If the answer is "no", is the organizational location of the responsible individual at an authoritative level above that of the major department heads? \_\_\_\_\_

### 3. STRUCTURE

The primary purpose of the ADP plan is to direct and control the investment of ADP resources. To accomplish this purpose, a structure of short- and long-range ADP plans must be developed. This structure should provide for the short-term operational needs of each organizational unit as well as their future requirements. An agency-wide ADP plan should be the product of an established, agency-wide, regularly scheduled, planning cycle.

The elements of the ADP planning structure should be formalized, documented, and communicated to all units of the organization that may be affected by the plan. These elements may vary somewhat from agency to agency. However, in all agencies there is a minimum structure essential to a sound ADP planning capability. That minimum is described in this section.

#### 3.1 Identify the Organizational Structure for ADP Planning

The structure and framework showing authority, responsibility, and accountability for ADP planning in each organizational unit affected by, or participating in, the ADP planning should be documented and well disseminated.

3.1.1 Can an organizational structure for ADP planning be identified from documentation issued at the agency headquarters (policy) level? \_\_\_\_\_

3.1.2 Is documentation describing the organizational structure for ADP planning available at each level of management whose subordinates use output from the ADP system? \_\_\_\_\_

3.1.3 Are non-management employees, whose job performance is affected by ADP output, aware of the organizational structure for ADP planning? \_\_\_\_\_  
(A sample of these employees should be questioned?)

### 3.2 Require Life Cycle Projections for Software Application Systems

Planning should cover the entire period during which resources will be spent on each application in the software inventory.

3.2.1 Do the long-range ADP planning instructions require, or the plan include, a set of time phased, standard decision points, or milestones, over the life cycle of each application in the software inventory? \_\_\_\_\_

3.2.2 Do the long-range ADP planning instructions require, or the plan include, a management evaluation of the technical, economic and effectiveness health of an application as part of each milestone? \_\_\_\_\_

3.2.3 Do planning instructions require, or does the plan include, an information base (feasibility study or other analysis) which supports, for each application in the software inventory, the requirements and management's decision for

- continuation of the application? \_\_\_\_\_
- development of the application? \_\_\_\_\_
- conversion of the application? \_\_\_\_\_
- redesign of the application? \_\_\_\_\_
- termination of the application? \_\_\_\_\_

3.2.3.1 Are milestones, similar to the following, included in the life cycle projection for each major application in the software inventory

- (a) requirements analysis? \_\_\_\_\_
- (b) design? \_\_\_\_\_
- (c) implementation? \_\_\_\_\_
- (d) production? \_\_\_\_\_
- (e) redesign (or termination)? \_\_\_\_\_
- (f) conversion (or termination)? \_\_\_\_\_

3.2.4 The operational efficiency of the computer system(s) is an essential component of the ADP planning base. One method for identifying its level of operational efficiency is through the computation and use of efficiency ratios. (The computation method for these ratios will vary for different types of systems - such as one that can be multi-programmed.)

3.2.4.1 Is the efficiency of the existing computer operation expressed in the plan by means of performance ratios or some equivalent method? \_\_\_\_\_

3.2.4.2 Is there an application production run ratio? <sup>1/</sup>

(This ratio is obtained when the total number of all production runs is divided by the total number of all runs for a specified period. For example, a weekly production run ratio might be the number of production runs divided by the total number of all runs for that week.)

$$\frac{\text{Production runs}}{\text{Total of all runs}} = \text{Production Run ratio}$$

3.2.4.3 Is there an application maintenance run ratio?

(This ratio is obtained by dividing the total of all application maintenance runs by the total number of all runs for a specified period.)

$$\frac{\text{Application maintenance runs}}{\text{Total of all runs}} = \text{Application maintenance run ratio}$$

3.2.4.4 Is there an application development run ratio?

(This ratio is obtained by dividing the total for all development runs by the total number of all application runs for the period specified.)

$$\frac{\text{Total number of development runs}}{\text{Total number of all runs}} = \text{Application development run ratio}$$

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<sup>1/</sup>The ratios shown on this page are concerned simply with the number of runs. The amount of computer time could be used instead. For example

$$\frac{\text{Computer use for Production Runs}}{\text{Total computer use all runs}} = \text{Production Run Computer use ratio}$$

- 3.2.4.5 Over the past 3 years, is there any indication that ratios similar to those above were used to inform management about the trends in
- o development? \_\_\_\_\_
  - o maintenance? \_\_\_\_\_
  - o production? \_\_\_\_\_
- 3.2.5 For the ten largest applications in the software inventory for the current (base) year of the plan, do records show the expenditures for
- o development? \_\_\_\_\_
  - o maintenance? \_\_\_\_\_
  - o production (operation)? \_\_\_\_\_
- 3.2.6 For the ten largest applications in the software inventory, do the records show the trends over the past three years for
- o development? \_\_\_\_\_
  - o maintenance? \_\_\_\_\_
  - o production? \_\_\_\_\_
- 3.2.7 For each application in the existing and planned software inventory, is there a projection over the life of the plan that contains an estimate of the
- o development costs? \_\_\_\_\_
  - o maintenance costs? \_\_\_\_\_
  - o production costs? \_\_\_\_\_
  - o redesign costs? \_\_\_\_\_
  - o conversion costs? \_\_\_\_\_



3.3 Require Life Cycle Projections for the ADP Hardware Configuration

The key factors and the information base that supports management's decisions on the life cycle of a computer configuration should be visible. The decisions should include the planned useful life of (a) each hardware component in the overall hardware configuration and (b) the operation system software.

3.3.1 Is there a 3-year history of the workload carried by the existing hardware configuration (such as in utilization reports)? \_\_\_\_\_

3.3.1.1 Does that history show the hardware configuration use ratio or some similar measurement of hardware use for specific periods for each of the 3 years? \_\_\_\_\_

$$\frac{\text{Actual capacity used}}{\text{Available capacity}} = \text{Hardware configuration use ratio}$$

3.3.1.2 Does that history show the annual impact on the use ratio of past hardware configuration changes? \_\_\_\_\_

3.3.2 Does the planned life cycle for the hardware configuration include a 5-year projection of the hardware components use profile which includes all

o new acquisitions? \_\_\_\_\_

o modifications? \_\_\_\_\_

(This projection should show the estimated annual

use of each major component of the hardware configuration as a percentage of the time the computer system will be turned on.)

3.3.2.1 Does the planned life cycle for the hardware include at least a 5-year pro-jection of the hardware configuration use ratio? \_\_\_\_\_

(That is, a ratio that shows the annual overall configuration capacity expected to be used as a percentage of the estimated available capacity.)

### 3.4 Standardize the Life Cycle Planning Structure

Consistent use of common planning terms over the life cycle is essential to assure effective communication and full understanding among the large numbers who contribute to, or are affected by, ADP plans.

3.4.1 Do the planning instructions (or the plan itself) contain a set of standard points (milestones) at which management is scheduled to review, evaluate and make decisions over the life cycle of each  
o major hardware component? \_\_\_\_\_  
o software application? \_\_\_\_\_

3.4.1.1 Is there a preliminary system plan milestone where (based on a rough plan and broad cost estimates) management is scheduled to make a a decision on continuation of the project? \_\_\_\_\_

3.4.1.2 Is there a feasibility study milestone where (based on a written report of the economic, technical, and operational feasibility) management is scheduled to make a decision on continuation or modification of the project? \_\_\_\_\_

3.4.1.3 Is there a cost benefit update for each milestone shown in sub paragraph 3.2.3 e.g., \_\_\_\_\_

- (a) preliminary system plan
- (b) feasibility study
- (c) design
- (d) development
- (e) implementation
- (f) production
- (g) redesign
- (h) conversion

3.4.1.4 If structured methods are employed in software development, are there milestones for structured analysis reviews (data flows) and structured design reviews? \_\_\_\_\_

3.5 Test the Transition from Functional to Technical Specifications

Loss of information during the translation of operational requirements, contained in functional specifications, to working technical design specifications can result in unwelcome output products and costly surprises. Tests and evaluations to assess consistency should be required. This consistency should include the linkage between each of the different interpretations of the original operational requirements.

3.5.1 Has a procedure been established by which management can be assured of the consistency between

functional requirements and technical design specifications? \_\_\_\_\_

3.5.1.1 Does this procedure require that benchmark testing and evaluation criteria for every major hardware component and software application system be included as part of the agency head's approval of functional specifications? \_\_\_\_\_

3.5.1.2 Is the participation and understanding of the intended major users (of the output of the planned ADP applications) required for development of the benchmark tests? \_\_\_\_\_

3.5.1.3 Is the senior manager of each major organizational unit that will receive support from the planned ADP applications required to formalize his/her concurrence or nonconcurrence with the benchmark performance criteria? \_\_\_\_\_

3.5.2 Does the procedure require that each user provide advance drafts of the different outputs expected when the planned application is completed? \_\_\_\_\_

3.5.2.1 Are these sample "draft" outputs or screens prepared by, or concurred in, by the person in the functional organization who is expected to use them when the planned systems are in operation? \_\_\_\_\_

3.5.2.2 Is the person who will receive and use the output from the completed ADP systems required to acknowledge accountability

for assessing whether or not the products satisfy the functional specifications? \_\_\_\_\_

3.5.2.3 Is this responsibility and accountability formalized by signatures? \_\_\_\_\_

3.5.2.4 Where the output is some form of a generalized computational or information retrieval capability, is there a description of these uses under the concurring signature of each person in the organization for whom they are intended? \_\_\_\_\_

3.5.3 Has a knowledgeable separate party, not involved in the statements of the ADP requirements or their use when completed, evaluated the benchmark criteria against the expectation in the functional specifications and assessed the consistency between them? \_\_\_\_\_

3.5.3.1 Was the internal auditor used for this task? \_\_\_\_\_

3.5.4 Where there is no audit trail of the above consistency (between stated ADP requirements and preliminary technical designs and/or request for proposals from commercial vendors) is there a written statement from one or more managers of major functional organizational units which identifies the reasons the trail is missing? \_\_\_\_\_

3.5.4.1 Are such statements identified as the source of investment risks and brought to the attention of the agency head or deputy as part of the review of the long-range ADP plan? \_\_\_\_\_

3.5.4.2 Has the portion of the preliminary or tentative design, which has not been previously accomplished anywhere else before and for which there is no existing precedent, been identified as a resource investment risk? \_\_\_\_\_

### 3.6 Require Compliance with Standards

For reasons of economy, compatibility, and intra-organizational unit communication, at a minimum, the ADP technical and operational standards established by the Federal Information Publication Standards (FIPS) documents should be required.

3.6.1 Do planning instructions require compliance with some set of ADP standards? \_\_\_\_\_

3.6.1.1 Are the technical standards generally comparable with those outlined in the Federal Information Processing Standards publications issued by the National Bureau of Standards? \_\_\_\_\_

(There should be some reference to these publications).

3.6.1.2 If not, are comparable standards in force? \_\_\_\_\_

3.6.1.3 Is there an additional set of ADP technical specifications used to improve agency-wide communications and compatibility of ADP systems within the agency? \_\_\_\_\_

3.6.1.4 Is an effort made to translate user requirements into functional specifications (as opposed to technical specification) to be approved by the agency head or his/her deputy? \_\_\_\_\_

3.6.1.5 Are the functional specifications approved by the agency head or his/her deputy consistently included in acquisition documents? \_\_\_\_\_

3.7 Establish a Planning Time Frame

The time frame for achieving the long-range ADP objectives should be identified as a sub-set of the long-range agency programs they support. The minimum period covered should be 5 years.

3.7.1 Has a time frame been set within which the long-range ADP objectives are to be achieved? \_\_\_\_\_

3.7.2 What is that time frame? \_\_\_\_\_

3.7.3 Is that time frame consistent with the long-range agency programs which ADP is supporting? \_\_\_\_\_

3.8. Maintain the Planning Policies and Procedures Up-to-Date

Responsibility and accountability for maintaining the agency's written planning regulations, instructions and guidelines up-to-date should be assigned to the senior headquarters planning official acting for the agency head.

3.8.1 Is there documentation which assigns responsibility and accountability for maintaining the written planning regulations, instructions, and guidelines up-to-date? (\*2.11.4) \_\_\_\_\_

3.8.1.1 Is this responsibility assigned to a senior official, on the headquarters staff, who reports directly to the agency head or his/her deputy? (2.11.4.1) \_\_\_\_\_

3.8.1.2 If the answer is "no", is the organizational location of the responsible individual at an authoritative level above that of the major department heads? (\*2.11.4.2) \_\_\_\_\_

### 3.9 Require a List of Long-Range Objectives

The heads of all organizational units that receive a prescribed level of ADP support annually should be required to list their long range ADP objectives. The threshold should be set by each agency.

3.9.1 Has each unit manager been required to include in his/her long range ADP plan a ranking of ADP applications by degrees of efficiency, effectiveness, and economy of operations and payoff? (\*1.7.1) \_\_\_\_\_

3.9.1.1 Are the unsatisfactory or marginal support

---

(\*1.7.1) Questions are similar but are repeated here to provide  
(\*2.11.4) stand alone answers to this section.  
(\*2.11.4.1)  
(\*2.11.4.2)



capabilities identified in quantitative terms? (\*1.7.1.1) \_\_\_\_\_

3.9.2 Is each functional manager required to identify those existing applications whose modification and/or enhancement would increase the efficiency, economy, or effectiveness of operations? (\*1.7.3) \_\_\_\_\_

3.9.2.1 Is there a requirement to describe these modifications and/or enhancements in quantitative terms? (\*1.7.3.1) \_\_\_\_\_

3.9.3 Is there a requirement that functional managers identify new ADP capabilities that will increase the effectiveness of their operations? (\*1.7.4) \_\_\_\_\_

3.9.3.1 Are these new requirements identified in quantitative terms? (1.7.4.1) \_\_\_\_\_

### 3.10 Include Planning Assumptions

The objectives of the ADP resource investment as a function of the agency mission are often changed by events external to the agency. Political, economic, technical, and social trends should be assessed for their impact on the agency mission. For example, new legislation may increase or decrease the projected workload. The head of each organizational unit should make such an assessment and

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(\*1.7.1.1) Questions are similar but are repeated here to provide stand  
(\*1.7.3) alone answers to this section.  
(\*1.7.3.1)  
(\*1.7.4)  
(\*1.7.4.1)

these should be included as factors or assumptions influencing the long-range ADP objectives.

3.10.1 Is there written documentation that shows that the head of each organizational unit does assess trends for impact on his/her unit's functional tasks in the following areas

- o political? \_\_\_\_\_
- o economic? \_\_\_\_\_
- o technical? \_\_\_\_\_
- o social? \_\_\_\_\_

(\*2.2.2)

3.10.1.1 Based on the type of assessment mentioned, are factors or assumptions developed which influence the content of long-range objectives? (\*2.2.2.1) \_\_\_\_\_

3.10.2 Are assumptions included as an integral part of the agency's long-range ADP plan? (\*2.2.3) \_\_\_\_\_

3.10.2.1 Is there any evidence that the agency head reviewed the planning assumptions and approved them? (\*2.2.3.1) \_\_\_\_\_

### 3.11 Amplify the ADP Objectives

While maintaining consistency in goal direction, the objectives, down to the level of each ADP application, should be amplified, documented, and used as the basis for work planning.

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(\*2.2.2) Questions are similar but are repeated here to provide stand  
(\*2.2.2.1) alone answers to this section.  
(\*2.2.3)  
(\*2.2.3.1)

3.11.1 Is there an objective, or sub-objective, documented for each ADP application listed in the ADP software inventory? \_\_\_\_\_

3.11.2 Can the sub-objectives for the ADP applications be correlated with the broad long-range ADP objectives contained in the long-range plan? \_\_\_\_\_

3.11.3 Is there an audit trail showing consistency of content between the objectives and sub-objectives of the ADP applications and the objectives contained in the long-range ADP plan? \_\_\_\_\_

(Where there is a large inventory of ADP applications, the audit trail should be ascertained for a valid sample.)

3.11.4 Does the work plan correlate with the ADP application objectives at the application program level? \_\_\_\_\_

3.11.5 Is the work plan, as a whole, consistent with the long-range ADP objectives? \_\_\_\_\_

(The work plan is that schedule or estimate of work that is needed to build the system.)

### 3.12 Expose Support Problems

Require from the head of each organizational unit a list and description of each existing application which is providing unsatisfactory support and/or a marginal payoff.

3.12.1 Has each functional manager been required to include in his/her long-range ADP plan a list of those ADP applications which he/she uses but which provide unsatisfactory support or which have only a marginal payoff to his/her efficiency, effectiveness, and economy of operation? \_\_\_\_\_

(\*3.9.1) (\*1.7.1)

(\*3.9.1) Questions are similar but are repeated here to provide stand alone answers for this section.

(\*1.7.1)

3.12.1.1 Are the unsatisfactory or marginal support capabilities identified in quantitative terms? (\*3.9.1.1) (\*1.7.1.1) \_\_\_\_\_

3.12.2 Are the reasons for dissatisfaction documented? \_\_\_\_\_

3.13 Exploit New Opportunities

Require from the head of each organizational unit a list and description of new opportunities for use of ADP resources which have a potential for enhancing the quality of that unit's, or the agency's mission performance.

3.13.1 Is there a requirement that functional managers identify new ADP capabilities that will increase the effectiveness of their operations? (\*3.9.3) (\*1.7.4) \_\_\_\_\_

3.13.2 Does plan implementation for analyses, design and development of computer software call for state of the art methods that use the computer to assist in generating software application programs and data bases? \_\_\_\_\_

3.13.3 Does the agency have a documented procedure for flagging applications or systems with obsolete software technology? \_\_\_\_\_

3.13.3.1 For each significant application is there a projected assessment of its technical status relative to the state of the art for each remaining year of its full life cycle? \_\_\_\_\_

\*Questions are similar but are repeated here to provide stand alone answers for this section.

### 3.14 Identify the Potential for External Support

Require from the head of each organizational unit a listing and individual description, including estimated cost, of ADP support which in his/her view may usefully be provided by an external source.

3.14.1 Has the head of each organizational unit prepared a list of ADP applications available from an external source that would result in increased productivity or have some other "pay off" if acquired; i.e.

o from another Government agency? \_\_\_\_\_

o from a commercial vendor? (\*1.7.5) \_\_\_\_\_

3.14.1.1 For each proposed external support ADP application, is there a requirement that the estimated cost be included? (\*1.7.5.1) \_\_\_\_\_

3.14.1.2 Does the plan contain arrangements for software or hardware sharing with other Federal agencies? \_\_\_\_\_

3.14.1.3 Where appropriate does the plan cover such contingencies as:

o emergency response procedures for events such as fires, floods, natural disasters or threats to ADP facilities? \_\_\_\_\_

o backup operations procedures to assure that essential ADP tasks can be conducted if there is a disruption to the primary facility? \_\_\_\_\_

o recovery actions to facilitate timely restoration of services? \_\_\_\_\_

### 3.15 Perform an Economic Analysis

A thorough economic analysis allows management to choose one proposed program over other alternatives based on the systems' projected costs and benefits.

(\*1.7.5) Questions are similar but are repeated here to provide (\*1.7.5.1) stand alone answers to this section.

This can only be accomplished when estimates for all systems' costs and benefits are stated in comparable quantitative terms.

3.15.1 Is there a policy and guidance for the performance of an economic analysis? \_\_\_\_\_

3.15.2 Do the guidelines require

3.15.2.1 investigation of alternatives? \_\_\_\_\_

3.15.2.2 costs and benefits for each alternative? \_\_\_\_\_

3.15.2.3 determination of the relative benefits of each alternative through a comparison of costs and benefits for both hardware and software. \_\_\_\_\_

3.15.2.4 a check to validate costs? \_\_\_\_\_

3.15.2.5 documentation of

o methodology? \_\_\_\_\_

o source of costs? \_\_\_\_\_

o rationale? \_\_\_\_\_

o assumptions? \_\_\_\_\_

o constraints? \_\_\_\_\_

o priorities? \_\_\_\_\_

3.15.2.6 identification of the key variables associated with the sensitivity to change? \_\_\_\_\_

3.15.2.7 determination and validation of the degree of risk or uncertainty in the results? \_\_\_\_\_

### 3.16 Require a Risk Assessment

The agency head should require that a level of investment risk be assessed for each new system or major revision planned. This assessment should include risk factors for software applications, operating system software, and hardware as well

as overall probability of success or failure. (One useful rule is that the probability of achieving that pay off is directly related to the degree with which the expected performance criteria of a system is quantified.) (\*1.6)

3.16.1 Has the agency head been provided with some assessment of the risks associated with major changes or new system developments? \_\_\_\_\_

3.16.2 Has the agency head been provided with the estimated costs and technical criteria that will be used to reduce dependence on the manufacturer of the current hardware? \_\_\_\_\_

3.17 Provide for Plan Implementation (Activation)

The transition from "plan" to action normally begins with the allocation of funds as part of an approved agency budget. At this point the agency should formally designate an office or official as responsible and accountable for these resources. (\*1.10) (\*2.11)

3.17.1 Is there a written document which identifies and holds responsible and accountable a specific official or officials for plan implementation? \_\_\_\_\_

3.17.2 Does that document or a separate one allocate or transfer funds or other resources for that purpose to the official(s) identified? \_\_\_\_\_

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(\*1.6) Questions are similar but are repeated here to provide  
(\*1.10) stand alone answers to this section.  
(\*2.11)

#### 4. CONTROL

Because planning and control are inseparable, the control methods should be an integral part of the planning documents. While highly dependent on individual management styles, there are, nonetheless, minimum essential elements of management control for ADP planning. The most important of these essential elements is quantitative performance capabilities. Quantitative terms make it easier to maintain a focus on the progress toward achievement of the goals and objectives contained in both the ADP plan and the mission programs that the ADP plan supports. A visible, easy to understand, quantitative control method also assures effective communication and enhances the organization's commitment to the goals management has set. The essential elements of a quantitative method for management of ADP planning are presented in this section. The more specific reporting information needed to maintain the control focus is covered in section 5.

##### 4.1 State all Performance Criteria

A meaningful statement of the conditions expected when objectives are achieved should be included in the strategy for accomplishment of each ADP goal.

- 4.1.1 Is there a description of the conditions expected if the objectives are met?



4.1.2 Is the description in quantitative terms? \_\_\_\_\_

4.2 Require that Performance Criteria be Quantified

In each set of expected performance criteria; i.e., for each objective and sub-objective, a quantitative change should be included which can be compared to the existing performance to measure progress. If a new or revised capability is being described, it should contain some quantitative information which can be used as a basis for assessing the "pay off" of the investment.

4.2.1 For each objective and/or sub-objective in the ADP plan, is there an accompanying statement of the performance criteria expected when the objective or sub-objectives are achieved? (\*1.6.1) \_\_\_\_\_

4.2.2 Where such performance criteria are not included with the objectives or sub-objectives, is there some other basis in the planning documentation which communicates how achievement of the objective will be recognized? (\*1.6.3) \_\_\_\_\_

4.2.3 Are the performance criteria which describe how the achievement of objectives will be recognized, presented in quantitative terms? (\*1.6.4) \_\_\_\_\_

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(\*1.6.1) Questions are similar but are repeated here to provide stand  
(\*1.6.3) alone answers to this section.  
(\*1.6.4)

4.2.4 Can existing performance criteria be compared with expected capabilities stated in ADP plans to identify the gap between present and planned capabilities? (\*1.6.5)

4.2.4.1 Has a central planning group focused on those gaps as a means of identifying what the planned investment in ADP resources will buy? (\*1.6.5.1)

4.2.4.2 Has a central planning group reviewed the impact of this gap, or series of gaps, in ADP capabilities and reported in writing its assessment and recommendations to the agency head? (\*1.6.5.2)

### 4.3 Front end Planning Should be Quantitative

Descriptions of functional users' requirements should be stated in words that show a quantitative gap between existing manual or automated capabilities and those that are needed.

4.3.1 Is the existing system, or capability, described in quantitative terms?

4.3.2 Are the different organizational units that receive support from the existing capability, or system, identified?

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(\*1.6.5) Questions are similar but are repeated here to provide stand alone answers to this section.  
(\*1.6.5.1)  
(\*1.6.5.2)

4.3.3 Is the support received by each of these organizational units described in quantitative or other terms that provide an understanding of its impact on the duties and responsibilities of the units? \_\_\_\_\_

4.3.4 Are new requirements described in words that show a quantitative gap between existing capabilities, or systems, and those proposed? \_\_\_\_\_

4.3.5 Do those organizational units that will be supported by the requirements for new or revised ADP capabilities agree with the need expressed? \_\_\_\_\_

4.3.6 Were all of the requirements for new or revised ADP capabilities, or systems, written by the organizational units that will be supported by those systems? \_\_\_\_\_

#### 4.4 Quantify the Expected Benefits

If the expected capabilities required by a new ADP system; i.e., a software application, a hardware configuration or a mix of both added to an existing system, are achieved those results must contain identifiable benefits. Such benefits should be documented in terms that permit the agency head to assess the value to the organization of the investment performance.

4.4.1 Is there a cost benefit study or similar document which describes the benefits of the system? \_\_\_\_\_

4.4.2 Are quantitative performance capabilities in the cost benefit study described for individual application programs? (By quantitative we exclude words like improved, better, faster, etc. We include numbers that can be compared with other numbers.)

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4.4.4.2 If the answer is "no", what percentage of the existing inventory of application programs has its performance capabilities described in quantitative terms?

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#### 4.5 Quantify the Existing ADP Software Assets

All computer programs should be described in simple, consistent, realistic quantitative terms that are understandable to all levels of the organization. Two such criteria might include (1) the total number of instructions or lines of code per application, system - or other standardized component, and (2) the average cost per instruction. (See the Guide For a Software Inventory in Appendix I.)

4.5.1 Is there an inventory of all the ADP software assets?

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4.5.1.1 Is the software inventory accounted for in the same manner as are other capital assets? (See footnote on page 63.)

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4.5.2 Do the records show that an overview of the software inventory was presented to the agency head as part of the long-range plan? \_\_\_\_\_

4.5.2.1 Does the overview identify the programs in use, the users, the total cost, the number of different languages and other relevant items from the software inventory of the type illustrated in Appendix I? \_\_\_\_\_

4.5.3 Do the records show that an overview of the file inventory was presented to the agency head as part of the long-range plan? \_\_\_\_\_

4.5.3.1 Does the overview identify the files, the users whose requirements generated the input to each file, the size and cost of the file, its growth trends and other relevant information from a file inventory such as described in Appendix II? \_\_\_\_\_

4.6 Require that Proposed New or Revised Software Applications be Quantified

Unless some other basis is used to indicate the size of software applications, the estimated total number of lines of code per application and the estimated cost per line should be included in the plan.

4.6.1 Is the number of lines of code and the cost per line for each proposed new or revised application estimated? \_\_\_\_\_

4.6.1.1 If estimates are not included, is there some other reasonable method of quantifying the projections for new or improved software? \_\_\_\_\_

4.6.1.2 Is this other method (4.6.1.1 above) consistent with the way software assets are quantified and valued for the organization? \_\_\_\_\_

4.6.1.3 Where there is no method for quantifying projected software applications (as per 4.6.1 and 4.6.1.2), does the plan contain a reasonable method for estimating the cost and size of the software applications? \_\_\_\_\_

4.6.2 When the planned software applications are examined side by side with the existing software inventory, is there a year to year visible change in the size and value of the inventory? \_\_\_\_\_

4.6.2.1 If the change is one of growth, can that growth be correlated with increased or new capabilities? \_\_\_\_\_

4.6.2.2 If there is no growth in the size of the inventory, but there is still an increase in capabilities, can that increase be attributed to enhanced productivity? \_\_\_\_\_

#### 4.7 Quantify the Existing ADP Hardware Assets

All components of the entire hardware configuration should be recorded in an asset inventory so

that the total capital investment and other asset accounting information can be maintained up to date.

4.7.1 Are hardware acquisitions proposed in the plan justified on the basis of system capacity? \_\_\_\_\_

4.7.1.1 Have performance monitors been used in these analyses? \_\_\_\_\_

4.7.1.2 Is there a historical record of the system accounting data which was used in this analysis? \_\_\_\_\_

4.7.2 Is there a historical record (at least 3 years) which shows the difference between system capacity available and that actually used? \_\_\_\_\_

4.7.3 Is the annual size of the expected overage or shortage in system capacity gap estimated for the life of the plan? \_\_\_\_\_

4.7.3.1 Are the alternative approaches that were analyzed to plan the operating capacity shown? \_\_\_\_\_

(These approaches should be in cost benefit studies supporting the plan.)

4.7.4 Are the studies of capacity overages or shortages presented in capability performance terms as well as system capacity terms? \_\_\_\_\_

(That is, in terms that can be correlated directly with the operational performance requirements of those who use the system output (see section 1.2.2).)

4.8 Require that Proposed Hardware Acquisitions be Quantified

All costs for planned hardware should be estimated and aggregated in the same quantitative terms as is used for the existing hardware inventory.

4.8.1 Has the proposed hardware inventory been analyzed and an estimated agency-wide profile developed as to who will use it? \_\_\_\_\_

4.8.1.1 Does this aggregation identify the cost of each major user's output as a percentage of the proposed system cost? \_\_\_\_\_

4.8.2 Is each user required to acknowledge, in writing, the percentage so attributed? \_\_\_\_\_

4.9 Quantify the Existing Products of the ADP Systems

To provide a basis for correlating aggregate costs with specific types of runs (such as for application programs, maintenance or development) the output for the entire system should be identified.

This identification should be in easily understood terms, such as the number of lines of print, pages, or other acceptable units of output.

4.9.1 Is there an estimate of the total cost of each distinct output product produced by the current ADP operation? \_\_\_\_\_



4.9.1.1 Can the output products of each distinctive ADP application system be totalled to indicate the cost of all products of that system? \_\_\_\_\_

4.9.1.2 In terms of the end users, can these output products be identified so that the overall cost of the ADP application system can be traced to one or a group of end users who receive the output products? \_\_\_\_\_

4.9.2 What percentage of the total current output is costed (as described in 4.9.1) above)? \_\_\_\_\_

4.10 Require that the Proposed Products of the Planned ADP System be Quantified

Itemize and describe the products expected of the planned ADP systems. These products can then be compared with those of the existing manual or automated procedure, being replaced, and the reasons for the investment made visible in quantitative terms.

4.10.1 Is there an inventory of the output reports or screens expected from each computer application, contained in the plan? \_\_\_\_\_

4.10.1.1 Does this inventory show the expected user of each such product? \_\_\_\_\_

4.10.1.2 Is there an estimated cost shown for each type of output in the proposed output inventory? \_\_\_\_\_

4.10.1.3 Does each recipient of the output receive the estimated cost of that planned output? \_\_\_\_\_

4.10.2 Does a comparison of the current and planned output inventories show the magnitude of planned changes in terms of the existing output? \_\_\_\_\_

4.10.3 Can the planned output inventory be correlated with the user requirements, see 1.2.1 - 1.2.2.4, to pinpoint management accountability? \_\_\_\_\_

4.10.4 Does the record show that the central planning group examined the current and planned output inventories as part of their work? \_\_\_\_\_

4.10.5 Does the record show that the steering committee reviewed and approved the existing and planned output inventories? \_\_\_\_\_

#### 4.11 Require that Development Risk be Quantified

Research and development investments and any investment for which planned products are not quantified, as described in item 4.9, should have a confidence level assigned and be supported by a narrative describing the risks. (\*1.6)(\*2.9)(\*3.16)

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(\*1.6) Questions are similar but are repeated here to provide stand  
(\*2.9) alone answers to this section.  
(3.16)

- 4.11.1 Are there any existing or planned computer applications, or systems, which have not been quantified as described above? \_\_\_\_\_
- 4.11.1.1 Has a confidence level, identifying the risk, been established? \_\_\_\_\_
- 4.11.1.2 Is there a narrative explanation of the risk which includes the position of the chief sponsor of that effort? \_\_\_\_\_
- 4.11.2 Are these risk areas reviewed by the central planning group? \_\_\_\_\_
- 4.11.3 Were the risk areas reviewed and approved by the steering committee? \_\_\_\_\_

## 5. REPORTING

The reporting system for ADP resource usage should be in the mainstream of information used by management to control all its resources. The feedback should be described in words that show the link to accomplishments projected in the plan. It should report actual against planned performance in such key areas as the (a) software that controls and coordinates the entire system (system software), (b) user specific application software that performs mission-related functions, (c) hardware components, and (d) total dollar resources used by accountable management. The use of quantitative criteria as the basis for this type of control information was emphasized in the previous section.

In this section some types of reports which can assist management to detect deviations from planned accomplishments are described. Because most are quantitative, a sample graph or table reporting format can be used. They are applicable to all ADP systems and are essential for the control of ADP plan implementation.

### 5.1 Require Organization-wide ADP Resource Accounting and Control

The senior financial officer should be held responsible for providing an organization-wide system of

ADP resource accounting and control. This system should regularly provide top management with a current record of all ADP resources. It should show their status, use, use trends, costs, cost trends, and other analyses needed for developing plan starting points, projections and plan progress. In addition it should provide similar feedback to the head of each organizational unit who uses ADP support. 1/

5.1.1 Is the senior agency financial officer required to maintain an organization-wide accounting of ADP resources? \_\_\_\_\_

5.1.2 Is the senior agency financial officer required to provide accounting information which can be used for planning and control of ADP resource investments and expenses to the

- o agency head? \_\_\_\_\_
- o functional managers? -----

5.1.2.1 Is information provided on capital investments in

- o computer hardware? \_\_\_\_\_
- o new software (both applications and operating systems)? \_\_\_\_\_
- o major conversions of existing software? \_\_\_\_\_
- o major upgrades of existing software? \_\_\_\_\_

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1/ See Federal Government Accounting Pamphlet No. 4, "Guidelines for Automated Data Processing Costs, Illustrative Accounting Procedures for Federal Agencies" prepared by GAO during 1978. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402. Specify Stock No. 020-000-00162-3.

5.1.3 Does the accounting system maintain records in a form that permits the output of each application system to be quantified? \_\_\_\_\_

5.1.3.1 Can the accounting system provide information needed to compute the cost per item of output for an ADP application system? \_\_\_\_\_

5.1.3.2 Does the quantitative information maintained by the accounting system provide a data base which can be used to assist in determining whether forecasted output and estimated costs have been achieved? \_\_\_\_\_

5.1.4 Is the manager of each organizational unit routinely charged for all ADP services received or is otherwise routinely made aware of the cost of services received? \_\_\_\_\_

5.1.5 Is the manager of each organizational unit required to prepare a budget for the anticipated costs of ADP services? \_\_\_\_\_

## 5.2 Provide Life Cycle Costing

The agency accounting system should provide cumulative sums of actual costs for the life cycle of each application in the software inventory and the major components of the hardware system.

5.2.1 Are costs accumulated over the life cycle of ADP  
o applications? \_\_\_\_\_  
o systems? \_\_\_\_\_

- o hardware?
- 5.2.2 Can the agency accounting system provide cost accumulation for a single phase (or a single year) within the life cycle of an ADP
- o system? \_\_\_\_\_
  - o application? \_\_\_\_\_
- 5.2.3 Over the full life cycle of each significant application, are current costs recorded, future costs estimated, and aggregate totals computed for:
- o maintenance? \_\_\_\_\_
  - o modifications? \_\_\_\_\_
  - o enhancements? \_\_\_\_\_
  - o redesigns? \_\_\_\_\_
- 5.2.4 Are the actual ADP resource costs of each major organizational unit itemized and reported to the heads of those units on a routine basis? \_\_\_\_\_
- 5.2.5 Are the costs of intradepartmental ADP applications or systems accumulated and aggregated across all departments to identify the full cost of such
- o systems? \_\_\_\_\_
  - o applications? \_\_\_\_\_
- 5.2.5.1 Are the life cycle costs of intradepartmental ADP systems available in the financial records? \_\_\_\_\_
- 5.2.6 Can the accounting system be used by all levels of management to flag excessive costs for a life

cycle phase (or some similar event) in time to take corrective management action and preclude unanticipated resource expenditures? \_\_\_\_\_

5.3 Require Reports on Implementation of the ADP Plan

There should be a formalized reporting system which provides to top management, on a regular basis, information as to problems, opportunities, and deviations between planned performance and actual performance. (\*1.10)

5.3.1 Is there an administrative procedure in use that extracts and translates the projected performance criteria contained in the plan into tangible goals against which progress can be compared? \_\_\_\_\_

5.3.1.1 Is this information used as a basis for reporting progress toward its achievement? \_\_\_\_\_

5.3.1.2 Is this done for CPU time actually used in some accepted standard unit? For example, is central processing unit (CPU) time actually used reported and compared with a performance goal for CPU use contained in the plan? \_\_\_\_\_

5.3.1.3 Is it done for revision of existing

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(\*1.10) Question is similar but is repeated here to provide stand alone answers to this section.



application programs? For example, are the revisions planned for application Programs translated into tangible performance goals for specific users? \_\_\_\_\_

5.3.1.4 Is it done for design and use of new application programs? For example, are the expected performance criteria for new applications translated into tangible performance goals for specific users? \_\_\_\_\_

5.3.1.5 Is it done for all major objectives established in the ADP plan? For example, are all major objectives in the plan similarly translated into tangible performance goals for specific users (or other accountable managers)? \_\_\_\_\_

5.3.1.6 Does the status information contained in progress reports focus on the tangible performance goals such as those described above? \_\_\_\_\_

#### 5.4 Require a Software Inventory Report

The agency head or his/her deputy should have a feel for the scope, composition, complexity, and impact of the total ADP resource. This report is as important as the inventory records for any major corporate asset.

5.4.1 Is there an inventory of software applications? (\*4.5.1) \_\_\_\_\_

5.4.1.1 Is the inventory updated on an annual basis? \_\_\_\_\_

5.4.2 If a decision were made to upgrade or otherwise improve the ADP system, would the software inventory contain enough technical, operational, and cost detail to be usable in the development of an industry Request for Proposal (RFP)? \_\_\_\_\_

(To assist in answering this question, see our separate guide in Appendix I. It lists 29 items which should be checked.)

5.4.3 Is there an inventory of the files? (\*4.5.3) \_\_\_\_\_

5.4.3.1 Is the inventory updated on an annual basis? \_\_\_\_\_

5.4.4 If a decision were made to upgrade, or otherwise modify the ADP system, would the file inventory contain enough technical, operational, and cost information to be usable in the development of an RFP? 1/ \_\_\_\_\_

(To assist in answering this question, see our separate guide in Appendix II on this subject. It lists 25 items which should be checked.)

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(\*4.5.1) Questions are similar but are repeated here to (\*4.5.3) provide stand alone answers to this section.

1/The importance of the requirement that ADP plans contain detailed software inventory information can be appreciated by reading the Review and Analysis of Conversion Cost Estimating Techniques, Report No. GSA/FCSC-81/001, April 1981 used by the Federal Conversion Support Center, 5203 Leesburg Pike, Suite 1100, Falls Church, Virginia 22041, and the National Bureau of Standards Special Publication 500-90, Guide to Contracting for Software Conversion, Services, issued May 1982.

## 5.5 Require a Hardware System Inventory Report

The agency head should receive an annual hardware inventory report which lists each different hardware component, its cost, the manufacturer, its age, its reliability, and other relevant factors such as the system software supplied by the manufacturer. The report should be formatted in such a manner as to highlight (1) the cumulative changes from the previous year's report and (2) any trends in the composition and overall value of the inventory. (\*4.7)

- 5.5.1 Is there an inventory of all ADP hardware? \_\_\_\_\_
- 5.5.1.1 Is it kept up-to-date on at least an annual basis? \_\_\_\_\_
- 5.5.1.2 Does it show changes from the previous year? \_\_\_\_\_
- 5.5.1.3 Does it show changes projected for the next year? \_\_\_\_\_
- 5.5.1.4 Does it show the age of each different component? \_\_\_\_\_
- 5.5.1.5 Does it show the system software supplied with the hardware? \_\_\_\_\_

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(4.7) Question is similar but is repeated here to provide stand alone answers to this section.

5.5.1.6 Does it contain figures which indicate the costs of the various components? \_\_\_\_\_

5.5.1.7 Does it contain one figure showing the total cost of the inventory that is actually on board? \_\_\_\_\_

(NOTE: This is not the depreciated value.)

5.5.2 Does the agency head or his deputy indicate by signature or initials on the inventory report that the inventory report is seen at least once a year? \_\_\_\_\_

5.6 Require a Mission - Function - ADP Support Relationship Report

Submitted annually by the manager of each organizational unit that receives a significant level of ADP support, this report should contain a formal, either written or tabular, linkage between the ADP support and the agency mission statement(s). A convenient form for this report is a matrix which, if standardized, can be the basis for an agency-wide picture of how ADP supports the entire agency.

5.6.1 Is there a written document that identifies the specific application programs that support each organizational unit that receives significant ADP support? \_\_\_\_\_

5.6.1.1 Is the principal user of each application program identified as suggested in item 6 of Appendix I, the software inventory form? \_\_\_\_\_

5.6.2 Is there a written document that identifies the mission-function(s) that is being supported by each application in the inventory? \_\_\_\_\_

5.6.2.1 Each ADP application is supposed to contribute to the performance of some specific task or subtask that stems directly, or indirectly, from the organization's missions and functions. Are such functions or tasks identified for each application? \_\_\_\_\_

5.6.3 Is a report identifying the mission - function - ADP support relationship submitted to the agency head or deputy annually? \_\_\_\_\_

5.7. Show the Cost of ADP by Mission and Function Statements

The senior financial officer should be required to accumulate the annual costs of each ADP application and report these costs to the agency head in a format similar to that described in 5.6. above. By correlating such costs with mission-function statements (as in 5.6 above) the agency head will be made aware of the specific mission dependencies on ADP.

5.7.1 Does the cost accounting system capture and aggregate the total cost of each ADP application in the inventory? \_\_\_\_\_

5.7.1.1 Is there an annual report which shows the aggregate cost of each ADP application in the software inventory? \_\_\_\_\_

5.7.1.2 Are costs accumulated over the life cycle of the application? (\*5.2.1) \_\_\_\_\_

5.7.1.3 Is there an annual report which shows the aggregate cost for ADP support of individual functions? \_\_\_\_\_

5.7.1.4 Do functional managers receive this report? \_\_\_\_\_

5.7.1.5 Is there some other way that functional managers are made aware of the ADP support costs of each function? \_\_\_\_\_

5.8 Require a Summary of the Long-Range Plan by Mission - Function

For each year of the long-range plan, require the manager of each major organizational unit and the controller to prepare a projection containing the information specified in 5.7.

5.8.1 Is a long-range plan available which contains the estimates of ADP support required for each functional area supported by ADP? \_\_\_\_\_

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(\*5.2.1) Question is similar but is repeated here to provide stand alone answers to this section.

5.8.2 Does each functional manager review the long-range plan for his area and assume accountability for the ADP support estimates? \_\_\_\_\_

5.8.3 Does the controller combine the ADP support estimates for each functional area in the long-range plan and provide summaries for the agency head or his/her deputy? \_\_\_\_\_

5.8.4 Does the agency head or the deputy review and make the decision to request funds for these long-range projections? \_\_\_\_\_

5.9 Require Auditor Review and Report on ADP Plans

The internal audit staff should review the planning structure, the completed and proposed planning decisions, and provide an evaluation report to the agency head or his/her deputy. This report should provide an assessment of the degree to which plans support mission requirements.

5.9.1 Are the internal auditors required to review and validate any portion of the ADP plan for the agency on a regular basis? \_\_\_\_\_

5.9.2 Are the reports of such audits available? \_\_\_\_\_

5.9.3 Does agency head or the deputy review these audit reports prior to making their decisions on the content of the long-range ADP plan? \_\_\_\_\_

- 5.9.4 Does the agency head or his deputy have some other methods for assuring that the estimates for ADP support are reasonable and based on factual information? \_\_\_\_\_
- 5.9.5 Does the audit report advise the agency head or his deputy whether the projected ADP support is directly or indirectly supportive of specific mission tasks? \_\_\_\_\_
- 5.9.6 Does the audit report advise the agency head about the agency's compliance with policies and standards for Federal agencies to follow in establishing and maintaining internal controls in ADP systems that support agency programs and administrative activities? \_\_\_\_\_



INSTRUCTIONS FOR PROVIDING SOFTWARE INVENTORY INFORMATION\*

Application Program Information - This information should be on record for each computer program (model, utility program, program system, special purpose program etc.) which is stored in the library, currently operational, or under development for the programs operated by the central ADP staff or the individual user organizations. Some organizations use the term "application system" which is an aggregate of computer programs supporting one application. In that case the information in the appendix would be for the "application system."

- (1) Name - the name of the program.
- (2) Mnemonic Name - the mnemonic name of Program.
- (3) Current Status - the status of the program system.
- (4) Project Name - The mission related project or agency program under which this program system is being used, developed, or planned.

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\* The information in this appendix is intended as an illustrative guide. The purpose is to indicate that the software inventory contains a number of significant details which must be documented, kept up to date, aggregated, and examined at intervals as is done for the effective management of any important resource. It should not be expected that the software inventory will conform to this illustrative guide. However, the procedure in use should be complete enough to provide management with enough information to maintain effective management awareness and control of this resource.

- (5) Project Accounting Number - The proper accounting number of the agency program under which this application program is being used, developed, or planned.
- (6) USER - Name of the primary customer who sponsored the program. List all others as secondary users.
- (7) Documentation - The title(s) of the program documentation which may be useful in a conversion process (i.e. flowcharts, listing, etc.). The degree of completeness of this documentation and the currentness with respect to the program as it now exists. This information should be given in terms of the following ratings: Excellent, Good, Average, Poor. Also the number of pages in the appropriate documents should be shown.
- (8) Program Components - the names of subprograms that make up the system. If only one program, so indicate.
- (9) If operated outside of the agency, show location.
- (10) Computer(s) Used - List the computer(s) used to run the program. If installed on more than one, for concurrent development and operation,

indicate the operational computer.

- (11) Equipment Requirements - for each program listed, indicate the current equipment requirements for operating the program.
- (12) Unique Program Dependency on Current Hardware and Software - program dependency on hardware and contractor provided software should be shown. For example, if the program requires the use of a specific vendor's package, the name of the package should be shown:
- (13) Language of the Program - The language(s) of the program and the appropriate number of machine instruction and/or number of procedure oriented language instructions (i.e., FORTRAN, PL1, BASIC COBOL, ASSEMBLY etc.).
- (14) Files Used - If a program is under development, indicate the name(s) of the file(s), number of records, and number of characters per record expected to be used. For operational programs, indicate the name(s) of the file(s), number of records and number of character(s) per record used.

- (15) DMS/DBMS - If the program requires the use of a Data Base Management System (DBMS) or Data Management System (DMS), identify the DBMS or DMS.
- (16) Operating System - The name and release of the operating system currently used. Indicate the number of linkage(s) instructions required. Also, the mode of operation currently employed (i.e. Batch, On-Line, Interaction, etc.) should be shown.
- (17) Frequency of Operation - Number of times program is operated per month should be shown.
- (18) Average Run Time - The average run time for the program system. If the program system consists of more than one program, all of which are not run at one time, indicate the average run time for a run regardless of the number of programs used.
- (19) Life Expectancy - The year the requirement for the program is expected to expire or change sufficiently to warrant a new program. If requirement appears indefinite or unknown, that information should be shown.

- (20) Input Volume - The number of cards, tape size (characters), or other factors that describe the input volume to the program system.
- (21) Output Volume - The number of cards, tape size (characters), lines/page of printout, or other factors that describe the output volume of the program system.
- (22) Estimated Cost of Program Development - The cost and man-months required for development of the program. If program was developed by contractor or in-house, or if a combination percent of effort for each should be shown.
- (23) Estimated Current Operating Cost Per Year - The estimated cost in terms of computer hours and programmer/analyst man-months required for operation of the program.
- (24) Revision of Program - The number of revisions and man-months expended on the revisions for each year of the life of the program. Also, an estimate of the number and man-months required for revisions for the next 12 months.

- (25) Programming Responsibility - Name, organization, and phone number. If program is maintained under contract, indicate the contractor and the responsible internal staff member.
- (26) Availability and Location of Source Deck and Listings - Show who maintains the current source deck and listing. If located with a contractor, indicate name and location of contractor.
- (27) Program Function - A description of the operational function supported by the program.
- (28) Other Comments - Additional data or comments which could assist in the calculation of the cost of converting this program to the hardware of a different manufacturer should be provided.

(continued on next page)

(29) OVERVIEW SUMMATIONS

Totals for several of the above items can provide a fairly comprehensive overview of the software inventory. From this overview the agency head can obtain a quick assessment of the scope, complexity pervasiveness, impact, and cost of the software investment required for agency operations. Listings and/or totals are suggested for the below items to provide this overview:

(1)	(8)	(15)	(21)	(26)
(3)	(9)	(17)	(22)	(27)
(4)	(12)	(18)	(23)	(28)
(5)	(13)	(19)	(24)	(29)
(7)	(14)	(20)	(25)	

Does the record show that such an overview was presented to the agency head at least once a year?

INSTRUCTIONS FOR PROVIDING FILE INFORMATION\*

File Information - This information is requested for each file stored in the library or which is currently operational or under development.

- (1) File Name.
- (2) Mnemonic Name.
- (3) Project Number - The proper accounting number authorization under which this file was established and is being used.
- (4) Current Status - Active or inactive.
- (5) Location of File - The location where the file is kept.
- (6) Computer(s) Used - List the computer(s) which have access to the file.

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\* The information in this appendix is intended as an illustrative guide. The purpose is to indicate that the file inventory contains a number of significant details which must be documented, kept up-to-date, aggregated, and examined at regular intervals as is done for the effective management of any important resource. The method of file inventory need not conform to this guide. However, the one in use should be complete enough to provide management with enough information to maintain effective management awareness and control of this resource.



- (7) Principal Users - The identity of the user who required the development of the file. Secondary users of the file should also be identified.
- (8) Documentation - The title(s) of the program documentation which may be useful in a conversion process; i.e., flowcharts, listings, etc.). Indicate the degree of completeness of this documentation and the currentness with respect to the program as it now exists. This information should be given in terms of the following ratings: Excellent, Good, Average, and Poor. Also indicate the approximate number of pages in the document.
- (9) File Size - For each file the number of records and the number of characters per record for the file used should be shown.
- (10) Primary Storage Media - The media used for the primary storage of the file.
- (11) There is no number 11.
- (12) Estimated File Growth - The estimated file growth in terms of total characters for the time period.

- (13) Required Programs Unique to the File - Show along with the name and language of the program, the number of machine instructions and/or the number of procedure oriented language statements for each program that is unique to the use of the file. There is no need to list the programs that belong to a data management system.
- (14) DBMS or DMS - Identify the Data Base Management System or Data Management System used with the files.
- (15) Estimated Cost of File Development - The approximate cost and the number of man-months needed to develop the file should be documented.
- (16) Date Operational - The date that the file became operational.
- (17) Update Frequency - How often the file is updated (hour/day/week/month/qtr./year).
- (18) Output Report Frequency - The frequency of the output report of the file (hour/day/week/month/qtr./year).
- (19) Query Frequency - The ad hoc (unscheduled) query frequency of the file (if used this way).

- (20) Data File Used By - Programs which use the information from this file should be recorded.
- (21) File Function - Describe the mission function supported by the use of the file. If the description is contained in a general catalog of files or other type reference, that information should be shown.
- (22) Other Comments - Additional data or comments which could influence the calculation of the cost of converting this file to the hardware/software of another vendor should be shown.
- (23) Programming Responsibility - Name, organization, and phone number of persons responsible for and familiar with the use of the file.

Some Sample Uses of This Pamphlet

The criteria in this pamphlet can be used, we believe, to assist agency management, auditors, and others with specific tasks related to the ADP planning process. Four examples of such uses, which illustrate also the flexibility of the reference base in this pamphlet, are presented in this appendix.

Example 1: A Management UseIdentifying key subjects of the ADP planning process that are of direct concern to the agency head

Let's assume that an agency head with no background in ADP would like a summary of the direct involvement in the ADP planning process expected of his/her office. While such a summary may vary for different individuals, an example of a few of the questions from this pamphlet which might be useful for such a purpose are:

- 2.2.1 Is there documentation which describes the plans to achieve the agency program goals? \_\_\_\_\_
- 2.2.1.1 Does this documentation contain the short- and long-range objectives to be achieved for each program? \_\_\_\_\_
- 2.2.1.2 Is there sufficient quantitative or other explicit information contained in the statement of the program objectives (2.2.1.1) to provide an effective criteria for assessing when objectives are actually achieved? \_\_\_\_\_

- 2.2.3 Are assumptions included as an integral part of the agency's long-range ADP plan? \_\_\_\_\_
- 2.2.3.1 Is there any evidence that the agency head reviewed the ADP planning assumptions and approved them? \_\_\_\_\_
- 1.10.1 Does the agency head have a regularly scheduled review of the "expected" performance against "actual" performance contained in the ADP plan? \_\_\_\_\_
- 1.10.1.1 Does the record show decisions made by the agency head as a result of these reviews? \_\_\_\_\_
- 1.10.2 Are shortfalls between planned performance and actual performance identified on a system basis? \_\_\_\_\_
- 1.10.2.1 Are the reasons for the deficiencies, if any, made visible in the record? \_\_\_\_\_
- 1.10.3 Is there a standard set of decision points by which the actual performance against planned performance is followed? \_\_\_\_\_
- (This can be milestones such as those in the life cycle of a software application system).
- 1.10.3.1 Does the record show adequate communications and understanding of these milestones? \_\_\_\_\_
- 1.9.1 Does the record show that the agency head reviewed and approved
- o the financial forecast contained in the long-range plan? \_\_\_\_\_
  - o the priority of resource investments contained in the long-range plan? \_\_\_\_\_

Example 2: A Management Use

Identifying some organizational duties and responsibilities for ADP planning

Let's assume that an individual has been assigned to write the organizational charter for an ADP executive management committee (steering group) and an ADP central planning group. The paragraph numbers of questions that might be useful as reference information for this task are listed below.

<u>ADP STEERING GROUP</u> <u>REFERENCE QUESTIONS</u>	<u>CENTRAL PLANNING GROUP</u> <u>REFERENCE QUESTIONS</u>	
1.3.1.1	1.4	
1.2	1.4.1	1.5.2
1.3.2	1.4.2	1.5.2.1
1.3.2.1	1.4.3	1.5.3
1.3.3.1	1.4.4	1.5.3.1
1.3.3.4	1.5.1	1.5.4
		1.6

Example 3: An Auditor Use

Evaluating the completeness of an ADP planning process

As was mentioned in the introductory section, the criteria in this pamphlet represent idealized performance objectives and we doubt that any organization will meet all of them exactly as presented. Nevertheless, by using a procedure similar to the steps outlined below we believe a reviewer can use the contents of this pamphlet to help determine the completeness of an agency ADP planning process.

Step 1: Prepare a target list of key subjects on ADP planning

Using this pamphlet, other reference material, past experience and knowledge of the agency prepare a target list of the key subjects that should be covered in the agency's ADP planning process. One view of such a target

list containing 5 key subjects is shown across the top row of figure III-1 (next page).

**Step 2: Analyze the key subjects**

Select from this pamphlet, as evaluation criteria, those questions whose answers will provide or help develop information about each of the key subjects identified in step 1 above. For example, figure III-1 shows how the questions from this pamphlet might be re-packaged into separate lists for each of the 5 key subjects.

**Step 3: Prepare evaluation**

In context with the audit objectives, analyses of other materials and the answers to the above questions prepare the evaluation. In general the greater the number of answers to the questions that indicate unsatisfactory performance the more serious might be the management problems. It might be useful also for the reviewer to identify critical questions where negative answers indicate specific problems which require correction before large investments are made. For example, negative answers to questions such as those below might indicate weak management control over expensive and critical software investments.

3.2.5 ...do records show the current year expenditures for software development, maintenance and production?

5.2.3 Can the agency accounting system provide comparisons between cost estimates and actual cost accumulation for each phase (year) of the life cycle of an ADP system or application?

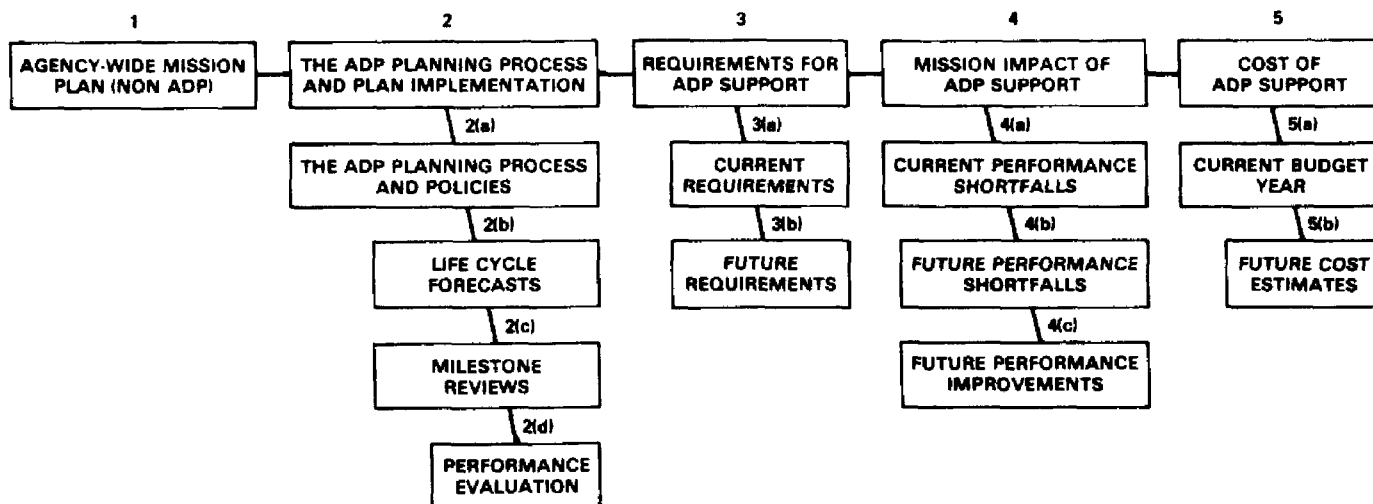
Because use of all the criteria shown in figure III-1 would result in a lengthy and expensive review, a preliminary evaluation might be developed by using only criteria considered most important to the review objectives. For example, in figure III-1 we have marked

**FIGURE III-1  
SUMMARY OF PLANNING ELEMENTS BY KEY SUBJECTS**

The purpose of this illustration is to suggest one way the planning elements in this pamphlet can be repackaged to help determine the completeness of an agency's ADP planning process.

Numbered in the top row of squares are the 5 key subjects mentioned in example 3 of this appendix. Then in the bottom half of this illustration, keyed to each of the 5 subjects and the sub subjects, are listed the paragraph numbers of questions from this pamphlet. The types of answers obtained from these questions should be helpful in evaluating the completeness of an agency ADP planning process.

While these key subjects and the lists of questions were developed by an auditor experienced in reviews of large Federal agencies they are presented for illustrative purposes only. They are not intended as nor should they be considered a General Accounting Office audit guide.



1	2(a)	2(b)	2(c)	2(d)	3(a)	3(b)	4(a)	4(b)	4(c)	5(a)	5(b)	
2.1*	1.3.1*	2.8.2	1.2.2.7	1.2.2.9	1.2.2.8	1.1.1*	2.2.2.1	1.2.2.1	1.6.6*	1.7.3*	1.2.2.2	1.2.2.6
2.1.1*	1.3.1.1	2.8.3	2.8.1*	1.9.1	1.6.1*	1.2*	2.2.3	1.2.2.3*	1.6.7*	1.7.3.1*	3.2.5*	1.7.5.1
2.2.1*	1.3.1.2	2.8.4	2.8.4*	1.10.1*	1.6.2	1.2.2	2.2.3.1*	1.2.2.4*	1.10.3*	1.7.4	3.2.6	1.8.1
2.2.1.1*	1.3.1.3	2.8.5	3.2.1*	1.10.3.1	1.6.3	2.3.1	2.4.1	1.2.2.5	2.3.1.2*	1.7.4.1	4.9.1*	1.8.2
2.2.1.2*	1.3.2*	2.10.1	3.3.2	2.6.3*	1.6.4	2.3.1.1	2.4.1.1	1.6.5*	2.9.1	1.7.5	4.9.1.1*	1.8.3
2.2.2*	1.3.2.1	2.10.2	3.4.1	2.6.3.1	1.6.9.2	2.6.1	2.7.1	1.6.5.1	2.9.1.1	2.4.1.4	4.9.1.2	1.8.4
	1.3.3	2.10.5		3.2.1*	1.7.2	2.6.2*	3.5.2*	1.6.5.2	2.9.1.2	2.9.2	4.9.2	2.4.1.3
	1.3.3.1	2.10.6		3.2.2*	2.4.1.2	3.2.3	3.5.2.1	1.7.1	2.9.1.3	2.9.3	5.1.1*	2.6.2
	1.3.4	2.10.7*		3.2.3.1	2.4.1.4*	3.11.1	3.5.3	1.10.2	2.9.1.4	2.10.3	5.1.2*	3.2.7
	1.4.1	2.11.1		3.4.1.1	2.10.4*	3.11.2	3.5.2.1	3.2.4.1*	2.9.1.5	2.10.4	5.1.2.1*	4.6.1*
	1.4.2	2.11.2		3.4.1.2	2.10.4.1*	4.3.1	3.5.2.2	3.2.4.2	2.9.1.6	2.10.4.1	5.1.3	4.8.1.1*
	1.4.3	2.11.3		3.4.1.3	3.5.1.1	4.3.2	3.5.2.3	3.2.4.3	2.9.1.7	3.13.1*	5.1.3.1*	4.8.2
	1.4.4	2.11.4*		3.4.1.4	3.5.1.2	4.4.2	3.5.4	3.2.4.4	2.9.3*	3.15.1*	5.1.3.2	4.6.1.2
	1.5.1*	3.1.1		5.3.1.6	3.5.1.3	4.5.1*	3.5.4.1	3.2.4.5	3.5.4.2	3.15.2*	5.1.4	4.6.1.3
	1.5.2	3.1.2			5.3.1*	4.5.1.1	3.6.1.4	3.3.1	3.15.2.6	3.16.1	5.1.5*	4.6.2
	1.5.2.1*	3.1.3			5.3.1.1	4.5.2	3.6.1.5	3.12.1	3.15.2.7	4.2.1	5.2.1	4.8.1.1*
	1.5.3	3.6.1*			5.3.1	4.5.2.1*	3.11.3*	3.12.1.1	3.16.1	4.2.2	5.2.2	4.8.2*
	1.5.3.1	3.7.1			5.3.1.6	4.5.3	3.11.4	3.12.2	4.7.3*	4.3.4*	5.2.3*	4.10.1.2
	1.5.4	3.7.2				4.5.3.1*	3.11.5	4.3.3*	4.7.3.1*	4.3.5	5.2.4	4.10.1.3
	1.6.9	3.7.3				4.10.1	4.1.1	4.3.4	4.7.4	4.3.6	5.2.5*	5.8.3*
	1.6.5*	3.15.1*				4.10.1.1	4.1.2*	4.7.1.1	4.11.1	4.4.1	5.2.6*	5.8.4
	2.5.1	3.15.2*				5.4.1.1*	4.8.1	4.7.1.2*	4.11.1.1	4.4.2*	5.5.1.6	5.9.4
	2.5.2	3.17.1				5.4.2	4.8.1.1*	4.7.2	4.11.1.2	4.6.2.1	5.5.1.7	
	2.5.3	3.17.2				5.4.3.1	4.8.2	5.3.1	4.11.3	4.6.2.2	5.5.2*	
	2.7.2	5.9.1*				5.4.4	4.10.3		5.9.6	4.7.1	5.7.1	
	2.8.1*	5.9.2				5.5.1*	4.10.4*			4.10.2	5.7.1.1	
		5.9.3				5.5.1.1	5.5.1.3			5.3.1	5.7.1.2	
						5.5.1.2	5.8.1*			5.3.1.3	5.7.1.3	
						5.5.1.4	5.8.2*			5.3.1.4	5.7.1.4	
						5.5.1.5				5.3.1.5	5.7.1.5	
						5.6.1*				5.9.5	5.8.1	
						5.6.1.1						
						5.6.2						
						5.6.2.1						

\*INDICATES QUESTIONS THAT MIGHT BE USED IN A PRELIMINARY EVALUATION



with an asterisk about 82 questions that might be used in a preliminary evaluation.

In developing the evaluation reviewers should be cautioned that in many cases substitute procedures, abbreviated measures or other approaches would be equally as effective as those identified in this document. An ability to recognize such substitutions and sufficient understanding about this area to make confident judgments about their effectiveness are essential for anyone who would use this publication.

Example 4: Auditor and management use

Evaluating a Particular Component of the ADP Planning Process

Let's assume that a task is to determine if ADP support requirements can be linked to the achievement of specific agency mission objectives. Since neither of these subjects is identified explicitly in this pamphlet it is necessary to review the table of contents and the relevant sections to select the appropriate questions. The questions listed below illustrate what such a selection process can produce.

Questions about agency mission objectives

2.1.1 Is the agency mission, or its goals, available as a written document? \_\_\_\_\_

(Note: OMB A-113 ¶3.6 uses missions and goals to mean the same thing.)

2.2.1 Is there documentation which describes the plans to achieve the agency program goals? \_\_\_\_\_

2.2.1.1 Does this documentation contain the short- and long-range objectives to be achieved for each program? \_\_\_\_\_

2.2.1.2 Is there sufficient quantitative or other explicit information contained in the statement of the program objectives (2.2.1.1) to provide an effective criteria for assessing when objectives are actually achieved? \_\_\_\_\_

2.10.2 Does the ADP strategy consolidate the long-range objectives proposed by the heads of the different major functional units? \_\_\_\_\_

Questions about ADP support requirements

2.3.1 Is there documentation which shows the ADP goals that support achievement of agency programs? \_\_\_\_\_

2.4.1 Is there documentation for an ADP strategy to accomplish each ADP goal; i.e., a set of decisions which have been made? \_\_\_\_\_

2.4.1.1 Does this strategy contain long-range objectives? \_\_\_\_\_

2.4.1.2 Are these long-range objectives stated quantitatively? \_\_\_\_\_

1.6.7 Is the central planning group required to establish a quantitative mission "payoff" ranking for each ADP application contained in the long-range plan? \_\_\_\_\_

1.6.8 Is the manager of each major unit required to coordinate, or dissent, with the mission payoff assessment identified by the central planning group? \_\_\_\_\_

5.9.5 Does the audit report advise the agency head or his deputy whether the projected ADP support is directly or indirectly supportive of specific mission task?

