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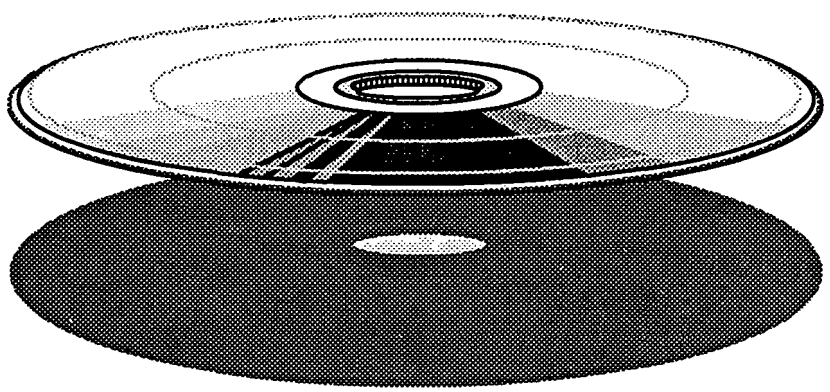
EPA

Guidance for Developing Image Processing Systems in EPA

EPA System Design and Development Guidance: Supplement to Volumes A & B



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EXECUTIVE SUMMARY

This document provides guidance for EPA managers interested in determining whether electronic image processing technology may be a cost-effective alternative for their information management needs. It explains how to define mission needs and how to conduct a feasibility study, the first steps necessary to justify investment in an imaging system. These analyses are key documentation in the government's budget and procurement process for acquiring and implementing information technology and systems. The term "image processing systems" (IPS) is defined for this guidance document as the storage, retrieval, processing and control of document images (i.e., document pages, maps, drawings, etc.) in electronic digital form.

1. THE PURPOSE OF THIS GUIDANCE DOCUMENT

The purpose of this guidance is to advise EPA managers on how to successfully demonstrate the need to make a capital investment in an image processing system -- first to their own management, then to the Director of the Office of Information Resources Management (OIRM) and, if warranted, finally to budget and oversight officials in the Office of Management and Budget (OMB) and the General Services Administration (GSA). This guidance covers the initial documentation EPA managers should expect to influence their decisions about imaging systems with preliminary assessments of:

- The nature of their document management needs
- Any specific document processing and records management problems that impede organizational effectiveness
- The options available to meet their needs and solve particular problems
- The economic, technical and organizational feasibility of an electronic imaging system solution.

Just how much detailed documentation is required to obtain agreement is generally in proportion to the magnitude of the investment. Investments associated with IPS frequently include much more than the costs of vendor-provided hardware and software and may include such new or additional resources as:

- Facilities, equipment and contractor services
- Customized applications software
- Office procedural manuals and updated records retention schedules
- Conversion and storage costs for historical and existing records
- Human resources -- both training and new roles for management and processing.

Early identification of needs as well as a focus on the range of realistic options should help to clarify whether and how IPS could significantly improve the performance of the organization. A clear understanding of the management objectives for undertaking major enhancements in document and records management programs helps managers evaluate the full potential impact of changes, benefits and costs they may experience if they decide to invest in an imaging system.

IPS is a relatively new and complex technology. Early experience in EPA and other organizations with prototype image processing systems indicates that guidance addressing the particular characteristics of these systems is important to managers. One of the major lessons from these prototypes is that IPS is a fundamentally new way of performing many office and program functions. Imaging systems offer innovative and effective processes for document creation, distribution, manipulation, storage and retrieval. To justify both the expenditure of funds and the inevitable disruption in established document handling procedures, an IPS system should not simply perpetuate current document management practices by automating them. An IPS solution should make use of the unique features of IPS technology to improve document management while at the same time supporting the overall objectives and priorities of the organization.

2. Documentation Supporting EPA Decisions

Image processing technology is powerful, but it not necessarily the best solution for all document and records management needs. The formal definition of mission needs and assessment of feasibility outlined in this guidance document should give managers the written analyses they need to determine relatively quickly:

- Whether they should invest in further, more detailed and expensive assessments of specific IPS solutions

- How large an investment over what period of time may be needed before improvements start paying off (including conversion, facility and staff costs mentioned above.)

Preliminary cost, benefit and return-on-investment (ROI) estimates are essential to meet Federal oversight requirements in the budget and procurement process. Both the Office of Management and Budget (OMB) and the General Services Administration (GSA) have criteria and dollar thresholds governing the acquisition of information technology and systems. If these are met, substantial documentation on the need for and projected return on the investment may be required.

This guidance covers the basic questions and topics that must be addressed in the mission needs analysis, preliminary design and options analysis for information systems. The products of these analyses -- the Mission Needs Study and the Feasibility Study -- address basic documentation needs for review within EPA and by oversight agencies. This guidance document supplements Volumes A and B of the Agency's *System Design and Development Guidance* and, like them, offers generic guidelines. Each program manager's document and records management needs, however, have unique as well as common concerns. Some needs are met with substantial investments in "major" or "high-end" systems; some can be satisfied with relatively inexpensive "low-end" systems. The early identification of the scope of the solution determines the extent of detailed analysis and documentation that may be needed to determine and justify the investment in an imaging system.

This guidance was produced under the auspices of the Image Processing Systems (IPS) Committee, whose charter is to ensure that EPA investments in IPS meet the Agency's overall needs and priorities. Appendix G presents the IPS Committee Charter. The Committee designed the IPS acquisition process described in this guidance to promote its oversight role and to begin building an understanding of the Agency's full range of strategic needs for imaging systems. The IPS Committee serves as a senior-level oversight and advisory body. Its recommendations inform the Director, Office of Information Resources Management (OIRM) who is responsible for exercising EPA's delegation of procurement authority by approving investments in information technology and systems, including IPS.

3. ORGANIZATION OF THIS GUIDANCE DOCUMENT

Chapter I of this guidance provides an overview of the entire process for acquiring image processing systems in EPA in six distinctive but iterative decision-making phases:

- Define "Mission Needs"
- Gain IPS Committee Concurrence
- Conduct Feasibility Study
- Obtain Director, OIRM Approval
- Perform Detailed Requirements and System Design
- Acquire and Implement System.

As noted earlier, this guidance document offers supplemental information to assist EPA offices with the first four steps of the process for image processing systems. The fifth phase of system acquisition involves extensive, indepth analyses outlined in Volume C of the *System Design and Development Guidance*. Two new guidance documents support the sixth phase of acquisition and implementation. They are entitled *Image Processing Systems: Implementation Guidance -- Parts I and II*:

- *Part I IPS Contract Hardware, Software and Services Description* -- provides a list of all hardware and software components available on an EPA contract for image processing systems.
- *Part II Acquisition and Implementation Guidelines* -- provides a summary of acquisition procedures, hardware configuration design, training guidelines, site preparation guidelines, installation and testing guidelines, operations guidelines and support responsibilities.

The IPS acquisition process overview in Chapter I also defines the role and outlines the procedures the IPS Committee will follow in exercising its role to ensure the productive introduction and use of electronic image processing technology and systems in the Agency.

Chapter II describes how EPA offices decide whether IPS is a solution they should further explore by documenting their needs for improved document processing and official records management. The chapter also

describes the criteria the IPS Committee applies in concurring, from a broader Agencywide perspective, with program managers' decisions that image processing technology is a good potential candidate to address particular problems and enhance overall organizational effectiveness.

Chapter III presents a methodology for conducting a feasibility study to get as early an assessment as possible of whether IPS is a reasonable solution to pursue in terms of economic justification, technical capability and organizational realism. This chapter summarizes how to address the estimated costs and benefits of alternative solutions in a relatively quick and inexpensive analysis. The results assist EPA program managers in deciding whether more time-consuming and expensive detailed systems requirements analyses appear warranted. The results of the feasibility study then assist the IPS Committee in recommending and the Director, OIRM in approving the decision to acquire image processing technology and systems.

This guidance also includes six appendices. Several apprendices have reference materials which may be useful in assessing mission need and feasibility, such as comparative assessments of the relative advantages and costs of paper, micrographics, image processing and hybrid image processing systems. EPA documents which may be useful in developing image processing systems, such as the Agency's policy on IPS implementation, are also included as appendices.

I. ACQUISITION PROCESS FOR IMAGE PROCESSING SYSTEMS IN EPA

The need for guidance and an acquisition process specifically tailored for image processing systems (IPS) became apparent from the Agency's experience with early IPS prototypes. The distinctive requirements and characteristics of image processing systems involve considerations beyond those encountered in general automated data processing system development. The term "image processing systems" is defined for this guidance document as the storage, retrieval, processing and control of document images (i.e., document pages, maps, drawings, etc.) in electronic igital form.

To ensure that EPA offices interested in using image processing benefit from this early IPS experience, the EPA Administrative Systems Council created an IPS Committee, whose charter is to advise the Director, Office of Information Resources Management (OIRM) and members of the Administrative Systems Council on proposals to implement advanced records and information management systems employing the use of digital imaging, storage and communications technologies.

This chapter describes the role of the IPS Committee and the overall process it has established for image processing system acquisition.

A. IPS COMMITTEE

The IPS Comittee is chaired by the Deputy Director, OIRM and draws its membership from senior technical managers within OIRM and the National Data Processing Division (NDPD in OARM/RTP) as well as senior program managers knowledgeable about image processing and its use in EPA. Appendix G presents the Committee's charter which includes definitions of its objectives; membership and structure; and operation.

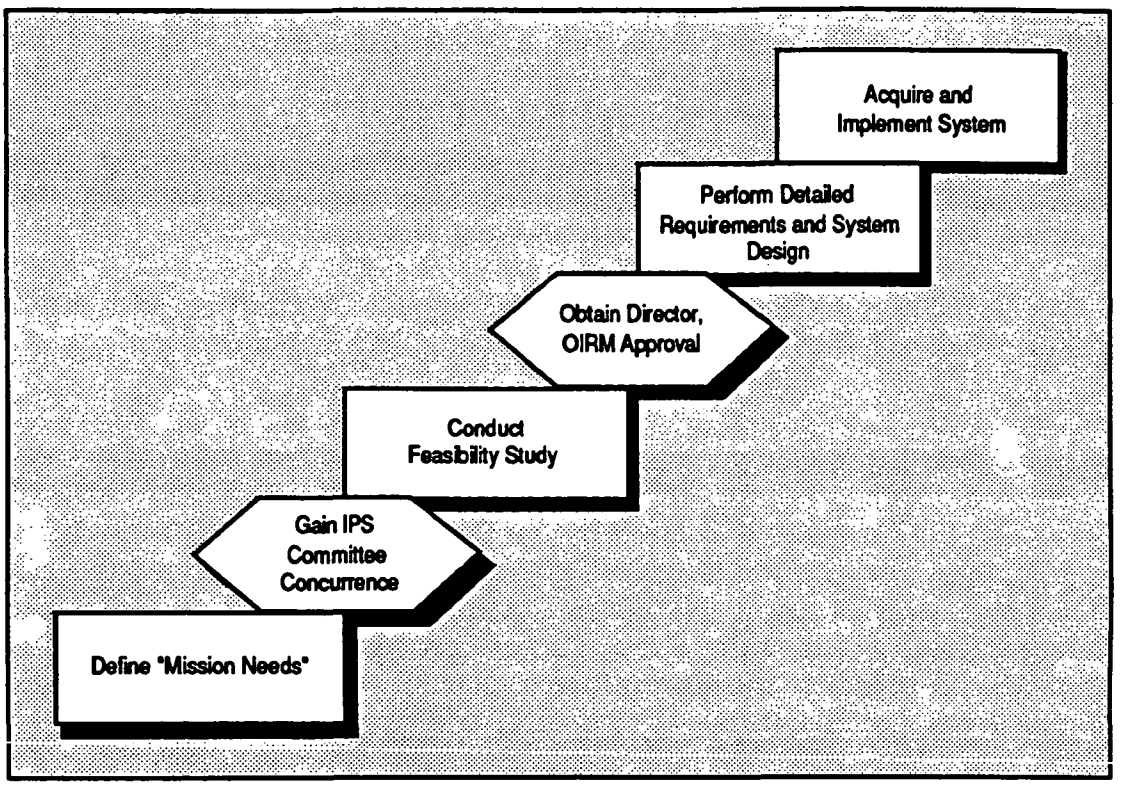
The essential role of the IPS Committee is to ensure the successful introduction of this new and complex technology which has significant impact on not only on individual offices but also on the Agency as a whole. The Committee and its members are to ensure that new proposals for IPS benefit from what the Agency has begun to learn from hands-on experience with electronic imaging systems. In addition to technology transfer, they are also to ensure coordination and prevent expensive duplications of effort where offices may have similar needs. The Committee should also advise EPA managers and the Director, OIRM of opportunities for integration and efficiencies of resource utilization, e.g., where all EPA Regional offices or

laboratories may benefit from the innovative system developed by one organization.

The Committee has recommended the Agency's policy for IPS acquisition and has published this guidance document as its initial activities in overseeing the productive introduction and utilization of image processing technology in EPA.

Exhibit I-1

Acquisition Process for Image Processing Systems



B. Overview of the IPS Acquisition Process

EPA's process for acquiring image processing systems includes six distinctive but iterative decision-making phases as shown in Exhibit I-1:

- Define "Mission Needs"

- Gain IPS Committee Concurrence
- Conduct Feasibility Study
- Obtain Director, OIRM Approval
- Perform Detailed Requirements and System Design
- Acquire and Implement System.

This process follows the basic analysis and decision-making structure of Volumes A, B and C of the Agency's *System Design and Development Guidance* which begins with identification of "mission need" and concludes with system acquisition and implementation.

The IPS acquisition process is distinguished from EPA's more generic systems development process only by its emphasis on the critical importance of the first step of defining mission need and the additional step of IPS Committee concurrence. The following sections outline the purpose, documentation and results of each of the six phases of the IPS acquisition process.

1. Define Mission Needs

The purpose of this phase is to conduct assessments which help EPA managers conclude that an image processing systems is an appropriate alternative for improving their document processing and official records management. This first step is critical to the rest of the acquisition process because it defines the management objectives and the improvements which promote the Agency's mission that managers should expect from their investment in IPS. These definitions of the concerns the imaging system should address are also invaluable aides to decision-making throughout the remaining feasibility, design, acquisition and implementation phases.

The data collection and analysis tasks to determine the needs for an image processing system do not require elaborate technical assessments. They do, however, demand careful examination of an organization's document processing and records management program. If an organization maintains current records retention schedules and regularly assesses its document handling procedures, these tasks can be completed efficiently to answer key questions about:

- **Management Need** -- Are documents and official records being managed to help meet the organization's mission?

- **Management Opportunity** -- Are changes in document handling and records management warranted to enhance staff and office productivity?

- **Alternative Solutions** -- What alternative document management approaches might meet these needs and enhance productivity?

Appendix D outlines the content of a Mission Needs Study to respond to these and other questions EPA managers will raise before deciding that IPS appears to merit further investigation.

Defining the nature of management problems and opportunities to be gained helps in identifying the range of alternatives which may address the problem. These alternatives are described in Appendix B and include:

- More efficient paper document-based approaches, enhanced with computer indexing, bar-coding of file folders to aid tracking , and other "low-tech" refinements.

- Microform-based approaches, including microfilm and microfiche, which may also be enhanced with computerized indexing and retrieval

- Image processing involving the conversion of paper document images into electronic digital information, which is then stored, retrieved and processed electronically

- Hybrid approaches involving combinations of the above technologies.

At this phase, results of the mission needs analysis help EPA managers define their records management requirements, evaluate the extent to which improvements depend upon enhancements to their records programs and whether information technologies may be a part of the management solution.

2. GAIN IPS COMMITTEE CONCURRENCE

If EPA program managers determine that IPS is an option they would like to pursue further, they contact members of the IPS Committee and review the results of their mission needs assessment to ensure the successful introduction of this advanced technology into their offices.

In reviewing the mission needs analysis, the IPS Committee does not seek to "screen out" requests for image processing -- apart from those that are clearly not appropriate applications of the technology -- as much as it seeks to offer guidance to sponsoring organizations, based on the Committee's experience with imaging.

In giving its concurrence to proceed with a feasibility study, the Committee may request that the sponsoring organization address specific issues in its analysis, such as giving consideration to a particular alternative involving a hybrid of technologies.

The Committee may also use the mission needs analysis to determine whether the scope of the proposed document management application should be broadened (or narrowed), or whether other organizations may have a collateral interest and might be brought into the process. For example, an important responsibility of the Committee is to ensure that duplicative feasibility studies are not conducted, such as the same program office in several regions independently analyzing identical applications. In these instances, the Committee will advise the Headquarters program office and interested regional program offices to coordinate efforts through a joint feasibility study.

The IPS Committee also may exercise its coordinating role when an application offers the potential of supporting operations in another office or functional area beyond the sponsoring office. For example, an image processing application in one program area may benefit an administrative function (or another program area) that uses the same documents or data associated with those documents. Cost recovery for Superfund site cleanup is one clear example of an activity involving both programmatic and administrative documentation that transcend organizational and data system boundaries. In these situations, the Committee may request coordination so that as the application development progresses, the opportunity for cross-functional/cross-organizational support is realized.

Ensuring the efficient use of the Agency's image processing equipment is another responsibility of the IPS Committee. Because of the high capital costs of large image processing systems, the Committee must encourage the sharing of IPS hardware, when practical. If two divisions within a Headquarters office, for instance, have pending requests that appear promising, it may be less costly to host their applications on one larger image processing platform than on two smaller platforms. The same need to coordinate equipment use applies to EPA regional offices as well. While it is premature at the mission needs analysis step to determine hardware capacities, it is not premature for the Committee to request that the feasibility analyses for such applications be coordinated. In fact, the economy of scale

gained through combining applications on a single IPS platform might permit economic feasibility when independent platforms would not.

Because the mission needs analysis serves as the foundation for all following analysis and development efforts, it is essential that it be done thoughtfully, yet not involve an elaborate technical analysis. Errors in understanding the relationship of document management needs to the mission of the sponsoring office, if not caught at this point in the process, can be very expensive to correct later.

3. CONDUCT FEASIBILITY STUDY

If the IPS Committee concurs that image processing is a potential solution worthy of further evaluation, then the sponsoring organization conducts a feasibility study. This study involves further definition of the alternatives and a comparison of their respective life cycle costs and benefits to determine the most appropriate solution for the document management needs. It is the Committee's responsibility to evaluate the results of the feasibility study and the sponsoring organization's conclusions if image processing is recommended as the most appropriate solution and advise the Director, OIRM in approving the proposed system.

Chapter III of this document presents the methodology the Committee requires for conducting the feasibility study. Several general points about the feasibility step of the IPS development and acquisition process are worth noting in this introductory chapter.

The term "feasibility", as it is defined for this process, encompasses several dimensions, including:

- **Economic justification** -- Is the cost of the proposed solution acceptable?
- **Technical capability** -- Is the recommended solution technically possible?
- **Organizational realism** -- Is it realistic that the proposed solution can be implemented by the target organization?

The actual determination of feasibility is complex because it involves weighing these factors with the benefits derived from managing documents in a way that better supports the organization's mission. Baseline characteristics that are developed in the Mission Needs Study are used to perform economic analysis for each of the alternatives. These economic considerations are then combined with the technological, organizational and

mission needs considerations in order to determine the most feasible alternative.

The feasibility study elaborates on the alternative solutions identified in the mission needs analysis, yet it is still conducted at a fairly high level. An investment to develop detailed requirements and design should only be made for the most appropriate alternative selected as a result of the feasibility study. Thus, a sponsoring organization needs to define its alternatives only to the extent required to support analysis presented in Chapter III.

Nonetheless, in some cases the IPS Committee may request further analysis by the sponsoring organization to clarify ambiguities or to test different cost factors. This is why it is important at the outset for the sponsoring organization to clearly understand the Committee's objectives for the feasibility analysis.

4. Obtain Director, OIRM Approval

If the feasibility analysis concludes that an image processing-based solution is the most appropriate, then the sponsoring organization receives authorization from the Director, OIRM to proceed with development of the application. The Director will consult the IPS Committee for advice in making this decision to approve, disapprove or direct additional analysis before the procurrement of an imaging system or a detailed design study may begin.

If image processing is determined not to be the appropriate solution, then the sponsoring EPA managers decide whether to proceed with another alternative that does not include image processing technology. The development and implementation of a solution other than IPS would occur outside the process described in this guidance document.

5. Perform Detailed Requirements Analysis and System Design

After receiving authorization to proceed with IPS application development, the sponsoring organization will begin to specify the application's detailed user and system requirements, and the system's design. This analysis will build on the foundation begun in the mission needs and feasibility steps.

The guidance for sponsoring organizations at this step of the development process is contained in the *EPA System Design and Development Guidance, Volume C: System Design, Development, and Implementation.*

During this step of the development cycle, the IPS Committee's interaction with the sponsoring organization will be similar to the interaction between OIRM and the NDPD for a major system development effort. Periodic progress meetings may be held, mutually scheduled by the IPS Committee and sponsoring EPA program office. These meetings will serve to keep the Committee apprised of progress and significant problems. The meetings will also provide an opportunity for the Committee to gain insights that may be helpful to pass along to the other IPS applications developers, as well as offer guidance to the EPA office developing its detailed requirement and design specifications.

At present, image processing systems are considered "major" systems, as defined by the *EPA System Design and Development Guidance,* by virtue of their scope of operation or magnitude of costs. The documentation and review requirements specified throughout this present guidance for IPS applications is consistent with the requirements for all major applications.

6. ACQUIRE AND IMPLEMENT SYSTEM

At the appropriate stage of IPS system design, the acquisition process will begin. This point is determined by EPA program managers leading the development of the imaging system. Written authorization from the Director, OIRM is required under the Agency's delegations of ADP procurement authority to invest in the necessary equipment and services from the appropriate Agency contracts. Actual implementation is expected to follow a project management and implementation plan defined as part of the detailed system design.

Guidance on the acquisition and implementation step of this process is contained in two separate documents on *Image Processing Systems: Implementation Guidance: Parts I and II:*

- *Part I IPS Contract Hardware, Software and Services Description* -- provides a list of all hardware and software components available on an EPA contract for image processing systems.

- *Part II Acquisition and Implementation Guidelines* -- provides a summary of acquisition procedures, hardware configuration design, training guidelines, site preparation guidelines, operations guidelines and support responsibilities.

The average timeframe in the federal government for the overall process from mission needs through acquisition and implementation of a major information system is approximately 18-to-36 months.

II. MISSION NEEDS STUDY

This chapter discusses the process used to perform a Mission Needs Study for a system in which the use of image processing technology is contemplated. It also discusses the concurrence process and criteria used by the IPS Committee when reviewing Mission Needs Studies.

The Mission Needs Study should identify the management objectives and any specific records management concerns. These will define the feasibility and requirements for an improved document management system. Since the focus of this manual is on imaging systems which deal with the manipulation and storage of documents, the focus of the Mission Needs Study will be on records management issues in an EPA program area. A range of alternatives to meet the defined needs must be assessed to arrive at tentative conclusions regarding the most appropriate technological approach to the problem.

The most critical aspect of the Mission Needs Study is providing sufficient detail to demonstrate the nature of the program's needs without getting lost in detailed data collection and analysis. The study is not meant to be extensive or costly because no feasibility for implementing the system has been established. On the other hand, enough information must be developed to narrow the options sufficiently to focus the Feasibility Study on the most appropriate document management solutions to the problem. Establishing a sharp focus for the Feasibility Study will greatly reduce the effort and cost necessary to conduct the study and will allow the study team to concentrate more effort in identifying the most promising solutions.

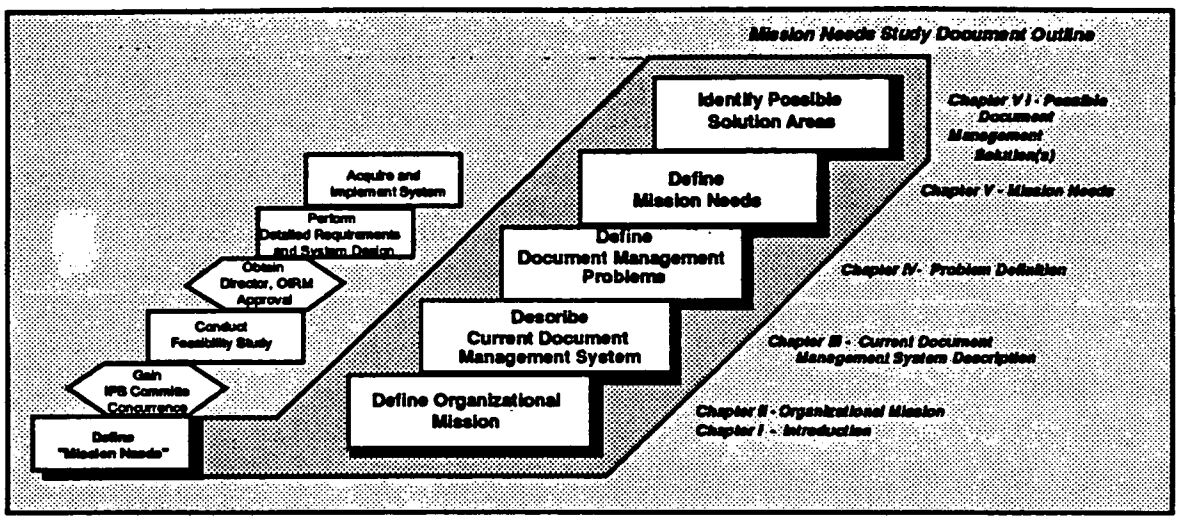
Another critical issue is the effectiveness of existing records management policies, procedures, operations and personnel. Any of these aspects of the records management program that are outdated, ineffective or unresponsive to the EPA program's needs must be corrected before information technology solutions are worth the investment. Any new system built upon weak document processing, insufficient staff resources or obsolete records retentions schedules risks perpetuating the existing problems. Some problems, in fact, might be aggravated with the introduction of some technologies. Because of its central role in the successful introduction of IPS, the program's records management should be reviewed and clearly understood prior to the establishment of system requirements.

Exhibit II-1 illustrates the process used to conduct the Mission Needs Study. This is the first step in the development process, and in many ways, the most critical. The high-level mission needs identified in this study will become the foundation for all future feasibility and requirements analyses.

They will also serve as the primary rationale to justify the cost and effort necessary to acquire the system.

Exhibit II-1

Steps for Conducting the Mission Needs Study



Appendix D provides an outline for the written report which describes the results of the Mission Needs Study. The document contains the following chapters:

- Chapter I (Introduction) provides a general introduction to the purpose of the study, the process used to conduct it, and the sources of information for the study.

- Chapter II (Organizational Mission) describes the organizational purpose, goals, objectives and functions of the sponsoring organization and its records management policies.

- Chapter III (Current Document Management System) describes the existing document management system and its strengths and weaknesses.

- Chapter IV (Problem Definition) defines the document management problems which exist that hinder the organization in meeting its goals and objectives.

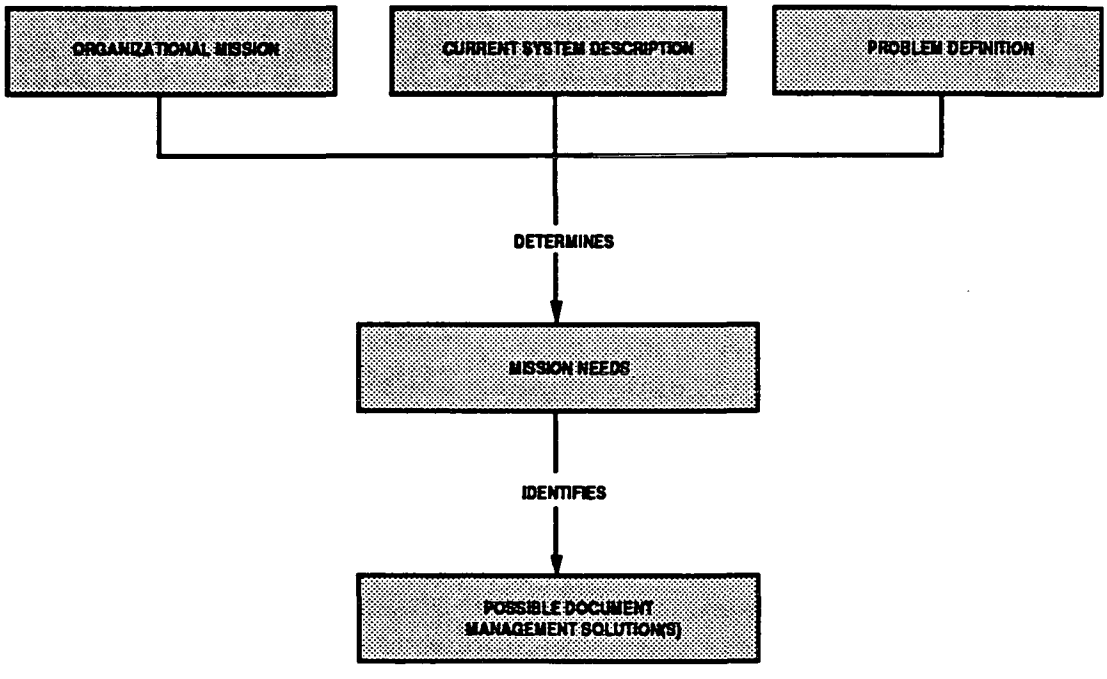
- Chapter V (Mission Needs) describes the document management needs required to access, store, process and control the documents maintained by the current system.

Chapter VI (Possible Solutions) provides a description of potential solutions to the problem with a rationale for each describing how it solves the problem and meets defined needs.

Exhibit II-2 identifies the methodology for conducting the Mission Needs Study. The remainder of this chapter provides a description of this methodology including the activities necessary to conduct the study and produce the study document.

Exhibit II-2

Mission Needs Methodology



A. DEFINE ORGANIZATIONAL MISSION

The first step in conducting the Mission Needs Study is to identify and document the goals, objectives and functions of the organization which are supported by an existing system. In general terms the organizational mission defines what the organization does today and where the organization is going tomorrow. The organizational mission is one element which establishes the framework for identifying its document management needs. Exhibit II-3 identifies the major components comprising the organizational mission.

Exhibit II-3

Organizational Mission Components

In order to identify these needs effectively, the mission must be defined in the context of the Agency's overall goals and priorities. For example, is the broad mission of the program to enforce EPA regulations by successfully prosecuting violators of EPA permits or to manage contracts which promote more effective performance by the Agency? The mission should encompasses all areas of the organization which are affected by the current document management system or could be affected by implementing a new system. Depending on the scope of the system, the organizational mission may be defined for a specific branch, division, program office, regional office or the entire Agency.

Laws, regulations and administrative policies and procedures have a controlling influence on the characteristics of records management systems. These issues must be well understood if the system is to ultimately serve the needs of the organization.

To warrant the expenditure of funds, an IPS system should not simply perpetuate current document management practices by automating them. An IPS solution should make use of the unique features of IPS technology to improve document management while at the same time support the overall objectives and strategy of top management in information management.

IPS systems may be used for a wide range of applications within an organization. Certain applications may be more strategically important than others. For example, there may be an immediate need to reduce the number of documents which are lost during a key phase of their processing. There may, however, also be a strategic need to change the overall process through which different staff in various locations interact as a document goes through various stages of review and use. Potential users must appreciate the features and capabilities that IPS technology offers to determine if an IPS can be implemented cost-effectively to meet immediate and longer-term program needs.

The complexity of an IPS varies with the application goals. Some systems intended for limited use in a single organization may be small, standalone systems that do not require extensive document processing or networking capability. On the other hand, systems which will be used throughout the Agency and require integration of information from many different sources could become very large and complex.

Additionally, a range of sensitive, human resource management issues may surface with a proposal to consider an IPS system. IPS systems may establish new information-access hierarchies, allowing rapid access to documents by persons who previously followed structured procedures to obtain them. Access control and document processing capabilities might be built into an IPS system to ensure that only authorized persons have access to documents or that documents must be processed in a specific way.

On a more basic level, it is important to consider the people who will actually be operating, using and managing the system. Most office documents and official government records are handled by many people throughout the organization. The system must ultimately be responsive to all of their needs -- and some groups will have distinctive needs not shared by others. People have different reactions to automation of their work. They may not share the same motivation to improve paperwork handling effectiveness and may resist change, regardless of the benefits to the organization. Also, the ability to process more work electronically in a unit of time may create a heavier workload for operators and users, as well as the temptation for managers to expect more work. These human factors must also be considered in the Mission Needs Study.

It is important to understand that the overall effectiveness of an IPS system is not determined by the capabilities of the hardware and software -- it is determined by the ability of people who take advantage of these capabilities.

B. DESCRIBE CURRENT DOCUMENT MANAGEMENT SYSTEM

Having identified organizational goals and objectives, it is now necessary to evaluate the current document and records management system of the organization. Is it expected that a proposed system will improve an existing document management and processing capability? Or should the new system be designed as a complete replacement of the existing system? These questions can only be answered and justified by achieving a good understanding of the current system.

The results of this analysis should provide an overall description of the lifecycle of documents critical to the operations and performance of the program office. The lifecycle of key documents begins with creation, through

active use to storage and disposition, either as an archival record or destruction. Reference to the organization's retention schedules is essential at this stage of analysis. The retention schedules provide an inventory of the important documents in the office; identify which documents are official governments records; and define disposition dates and procedures for each document.

After establishing the set of documents and records used in the paperwork supporting the office's functions, it is useful to distinguish different types of documents -- by how they are created and how they are used. One approach to organizing the office's many different types of documents into categories for further analysis might look like this:

- **Forms** -- where the graphic format and size dimension of the document are standard but the specific information requiring action changes (e.g., purchase requisitions and requests for personnel action)

- **Reference materials** -- where the documents are not changed by the holding office which uses this information to perform its work on a routine basis (e.g., regulations, contract terms and conditions, policy and guidance documents, and publications from other sources)

- **Working and official documents** -- where the documents are either created or modified by processes in the office while the documents are being developed or are held as a record of an official action of the United States Government (e.g., correspondence, record of decision, memorandum of understanding, regulations, court briefs and research reports)

- **Archival materials** -- where the documents are not changed by the office which either uses this information in its work on an infrequent basis (i.e., for historical trends) or is required by law to maintain inactive records on-site (e.g., dockets).

Some method for organizing all the program office's documents into useful categories helps create meaningful document profiles. These profiles establish a functional description of the document categories, including how they are processed and maintained under the current records management system. Data collected for these document profiles are typically represented by the kinds of questions illustrated in Exhibit II-4.

Exhibit II-4

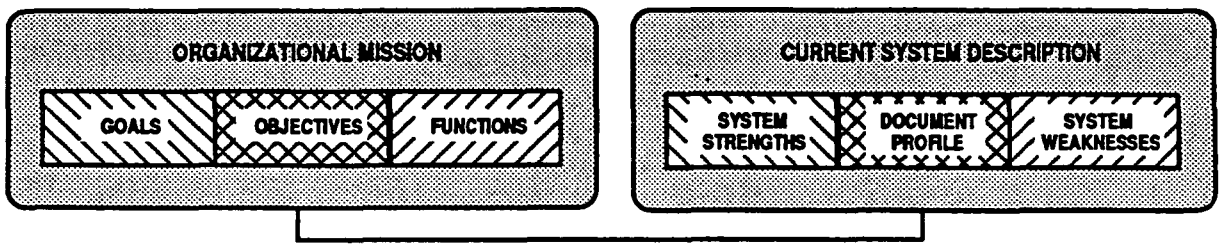
Document Management Profile

What documents are retained?
What is the average number of pages per document?
What locations are served by the systems?
What is the mix of color and size?
Where are the documents stored?
Who uses the documents?
Who manages and controls the documents?
Why are the documents created?
Why are the documents retained?
How many documents are received daily? Annually?
How many document are retrieved daily?
How many documents are processed daily?
How many documents are stored? How many pages?
How are the documents organized?
How are the documents managed and controlled?
How long are the documents retained?
How are the documents disposed?
How many documents will exist next month?
Next year? In five years?
How many users are served by the system?
How often are the documents accessed?
Are the documents double-sided?
Are there security requirements (e.g. Privacy Act)?
Do the documents contain official signatures?

In addition to preparing a document profile, it is important to develop an overall system description, including identifying the strengths and weaknesses of the current system. The objective is to retain the strengths and correct the weaknesses of the current system in order to implement a successful document management solution that solves the problems. Exhibit II-5 identifies the major components of the current system description.

Exhibit II-5

Current System Description Components



Information collected for the document profile and the system description can be obtained using the following techniques:

- Circulating survey questionnaires
- Conducting interviews with management and staff personnel
- Conducting additional research by analyzing system documentation and/or observing system operations.

The survey questionnaire should be designed to elicit quantifiable information concerning characteristics of documents managed by the current system. The wording of the questionnaire should be phrased carefully so that it can be easily understood. In other words, technical data processing terms should be removed and specific references to documents (e.g., document acronyms [DMR], form numbers [SF-52], etc.) should be used where appropriate.

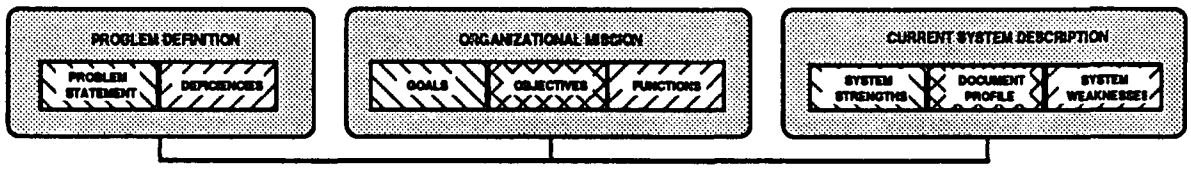
Chapter III of the Mission Needs Study Document, as shown in Appendix D, should provide document profiles and description of the current document management system including system objectives, responsibilities of operating staff, document profiles, process flow diagrams showing inputs, processes and outputs, and system strengths and weaknesses.

C. DEFINE DOCUMENT MANAGEMENT PROBLEMS

The document management problems which currently exist must be clearly defined in order to identify the document management needs and ultimately determine the best technological solution. The problem essentially identifies unmet document management needs or deficiencies of the existing system. These deficiencies define what the existing system cannot perform in order to meet organizational goals and objectives. Similar to the system strengths and weaknesses described above, these system deficiencies are also defined within the context of the organizational mission.

Exhibit II-6

Problem Definition Components



In addition to defining any problems, it is also important the sponsoring office understands the implications of changes that may occur when correcting these problems. An organization might create a new group or remove an existing group of staff to support a new document management system, or the organization might develop new procedures for document management. Depending on the scope and complexity of the problem and the solution implemented, these changes may have a significant impact on the organization.

Identifying the strengths and deficiencies of the existing system will establish the framework for defining the document management needs. Chapter IV of the Mission Needs Study Document, as shown in Appendix D, should provide an overall statement of the problem, as well as deficiencies of the existing system.

D. IDENTIFY DOCUMENT MANAGEMENT NEEDS

Description of the current system and definition of the document management problem establish the framework for determining what capabilities an improved document management system should provide. The description of strengths and weaknesses of the current system can portray how current and future document management needs can and cannot be met. Combined together, these elements can provide a foundation for system

enhancement that will preserve existing strengths, correct system weaknesses and eliminate deficiencies. The following criteria provide an effective basis for technology selection in the final step of the mission needs process.

1. DOCUMENT ACCESS

This need addresses which documents in the system are retrieved and used by managers and staff in the program office and the type of access required. Some of the issues to consider are:

- **Frequency of access:** Is access to documents frequent or seldom? Does access vary over time? If access is infrequent, then a non-IPS solution may be most cost-effective, such as microfilm or microfiche.

- **Speed of access:** Length of time required to access documents (rapid or slow)?

- **Single user or multi-user access:** How many users will need to access the same document or set of related documents at the same time?

- **Other access characteristics:** Do access characteristics change over time? Are the accessed documents usually related? If so, how? Access characteristics, such as what type of information is typically needed (specific information or general information), type of access (from one document to another in sequential order or random) and how many documents are accessed at the same time (single or many per access), all affect the technology decision and ultimate system characteristics.

2. DOCUMENT STORAGE

Storage requirements define how long and under what conditions documents must be available in the system. Some of the issues which should be considered are:

- **Storage quantity:** What is the total current document volume? How many documents must be stored by the system? What is the annual growth?

- **Storage duration:** How long must documents be stored in the system? If documents must be stored for a long time, then the ability of the storage media to remain reliable over time becomes an issue.

- **Storage mandate:** How long must the documents be retained to satisfy the legal, statutory and disposition requirements set forth in the Agency records disposition schedules? Do any of these requirements limit the range of acceptable storage media?

- **Active or inactive documents:** How long do documents stay active? Does access to documents become very infrequent with age?

3. DOCUMENT DISTRIBUTION

Distribution requirements relate to the extent to which documents must be delivered to multiple points in the organization in order to facilitate other tasks. Some of the issues that relate to this requirement are:

- **Extent of internal and external distribution:** Is document distribution required? How many copies of the document are typically distributed, both internal to the parent organization and to external organizations.

- **Type of distribution:** Is the whole document distributed, or is only a portion of the document necessary? Alternatively, is it necessary to distribute only data from the document? Are documents distributed in groups or individually?

4. DOCUMENT CONTROL

Document control relates to the security and accountability requirements for documents in the system. These concerns are defined by the requirements of the Privacy Act Program and legislation protecting confidential business information and computer matching. In financial and administrative documents, there are also objectives to minimize vulnerability to waste, fraud and abuse. The following issues influence the selection of technology in this area:

- **Security requirements:** How extensive are security requirements for documents in the system? Who sets the security requirements? Are they sufficient as they currently exist?

- **Document accountability:** How extensive is document accountability? Do the documents have intrinsic value if control of the document is lost? Who sets the

accountability requirements? Are they sufficient as they currently exist?

- **Security for portions of documents or for data from documents:** Do different security requirements exist for different parts of the same document? Is document level security/accountability required?

5. DOCUMENT PROCESSING

Document processing is the extent of document flow, modification or use of the document in the routine business of the organization. If the document goes through extensive review or modification during the creation process, or if routine business processes depend upon utilization and modification of the document, then document processing is involved. The following issues relate to this requirement:

- **Single or multiple persons processing documents:** Are documents typically processed by one person or by many? Are multiple offices involved? Is there a specified sequence of document flow during processing?

- **Internal and external document processing:** Are the documents reviewed or modified by external organizations? Are documents processed in groups or one by one? Are documents processed concurrently? Is there a requirement that documents be processed in a specified time?

A set of baseline characteristics must be developed to compare the current document management system to the possible solutions. These baseline characteristics are a subset of the mission needs and establish the foundation for performing economic analysis. In order to perform an equal comparison of the current system to each of the possible solutions, these baseline characteristics define the reasonable set of mission needs characteristics that should be reflected in the current system. Once established, these baseline characteristics are constant for all of the alternative solutions.

Exhibit II-7 presents a sample set of baseline characteristics that are used to select the range of alternative solutions. These characteristics are a subset of the document management profiles presented in Exhibit II-4. However, the document management profiles reflect only the current system In comparison, the baseline characteristics incorporate the mission needs that should be reflected in the current system. The baseline characteristics are further discussed in Chapter III - Feasibility Study. Exhibit II-8 identifies the

components that are used to derive the mission needs and depicts the baseline characteristics as a subset of those needs.

Exhibit II-7

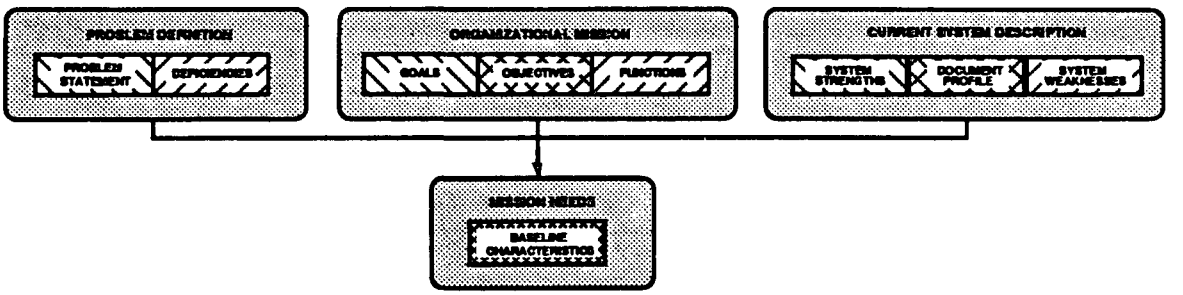
Baseline Characteristics

What is the average number of pages per document?
How many documents are received daily? Annually?
How many documents are retrieved daily?
How many documents are processed daily?
How many documents are stored?
How many pages are stored?
How many users must the system support?
How many locations must the system serve?
How many documents will exist next month?
Next year?
In five Years?
How long must the documents be retained?

As shown in Appendix D, Chapter V of the Mission Needs Study Document should describe the document management needs of the organization in terms of access, storage, distribution, control and processing. In addition, the baseline characteristics should be included for use in determining economic feasibility conducted in the next development phase.

Exhibit II-8

Mission Needs Components



E. IDENTIFY POSSIBLE SOLUTION AREAS

The final step of the Mission Needs Study process is to determine appropriate technology solution options that can meet program requirements. Exhibit II-9 identifies the possible document management solution areas. These possible solutions include:

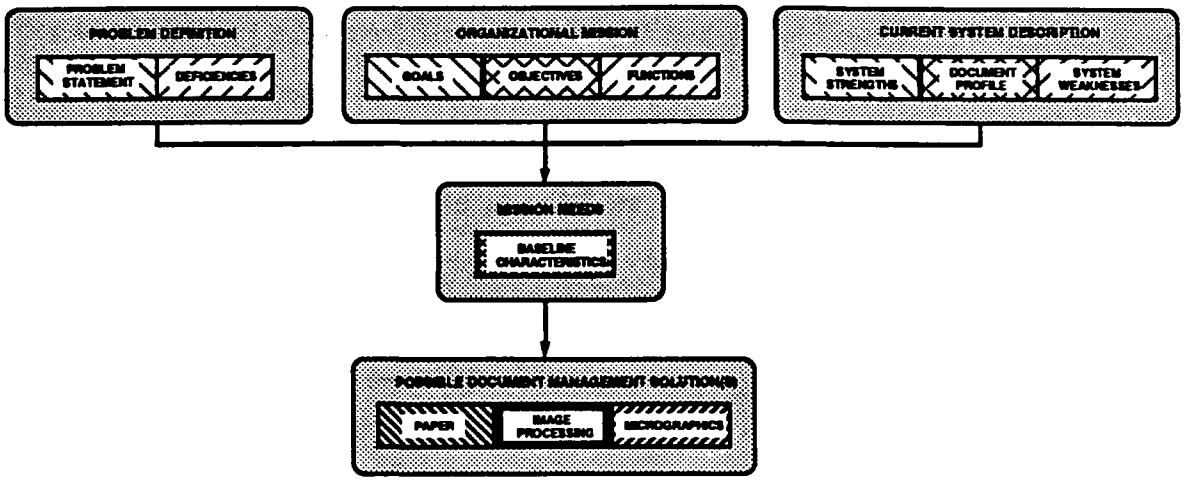
- Improved paper-based systems
- Microform systems using microfilm or microfiche
- Image Processing Systems
- Hybrid combinations composed of combinations of the above categories as well as other MIS technologies

Appendix B summarizes each of these solutions, which should be understood before proceeding with the Mission Needs Study.

Exhibit II-10 provides an illustration of the relationships between the criteria utilized to describe mission needs in the previous section and the basic technologies available as system solutions. This exhibit does not consider cost in the analysis, but merely depicts how well the needs criteria generally apply to the functionality of the solution areas. Appendix A provides a more detailed comparison of the requirements characteristics to the system solutions. The following discussion amplifies the information highlighted above under Section E.

Exhibit II-9

Possible Document Management Solutions



1. DOCUMENT ACCESS

Generally, image processing technology is most advantageous where the solution requires frequent access to large volumes of documents. Simultaneous access to paper documents by several users is difficult to manage without creating copies of the document. Finally, increasingly complex and demanding access requirements increase the likelihood that image processing technology may be an appropriate solution for the problem.

2. DOCUMENT STORAGE

Image processing systems are most appropriate in cases where large quantities of documents must be stored in the system. Technologies such as Write Once-Read Many (WORM) optical disks offer large storage capacity at a low cost and good long-term storage reliability. If some documents in the system are very active and others are inactive, then perhaps a hybrid system combining image processing with another technology is appropriate.

Image processing is a relatively new method for storing information and, therefore is still in the early stages of acceptance by courts and regulatory agencies. A legal precedent has not been established, to date, for the admissibility of information stored on optical storage medium in a court of law In current document management systems, micrographics remains the best legally acceptable medium to ensure document integrity and reliability.

3. DOCUMENT DISTRIBUTION

If distribution of multiple documents or portions of documents is required, an image processing system may be a suitable alternative. In general, IPS is best suited for applications requiring shared corporate databases of documents distributed to multiple areas.

Exhibit II-10

Comparison of Document Management Solutions

Requirements Categories	Paper	Micrographics	Image Processing
Document Access	◒	◒	●
Document Storage	○	◒	●
Document Distribution	◒	◒	●
Document Control	◒	◒	◒
Document Processing	◒	◒	●

Key:	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

4. DOCUMENT CONTROL

If security requirements are high, a number of options exist for enhancing document security, including microfilm and IPS. Extensive document accountability may also indicate the need for an image processing system. Additionally, if sensitivity requirements are different for various portions of the document or for data elements on the document, an image processing solution may be appropriate.

5. DOCUMENT PROCESSING

If documents are processed by multiple persons, in multiple offices, externally to the Agency or if processing is done to batches of documents, image processing technology may be appropriate.

Appendix A provides a more detailed view of these relationships, and Appendix B provides a brief description of the technological alternatives that are currently available. Utilizing the mission needs developed above and this information, the sponsoring office identifies the solution(s) that are most appropriate. The primary purpose of this process is to narrow the scope of the Feasibility Study to only those solution areas which are appropriate to the problem so that effort expended in the Feasibility Study can be as productive as possible.

As shown in Appendix D, Chapter VI of the Mission Needs Study should provide for each candidate solution, the name and description of the solution as well as a rationale why it may be an appropriate alternative to further analyze in the Feasibility Study.

F. OBTAIN IPS COMMITTEE CONCURRENCE AND DIRECTION

Exhibit II-11 summarizes the primary criteria the IPS Committee will reference when reviewing Mission Needs Studies. These criteria are intended to ensure that the evaluation of projects is done fairly, consistently and in a manner which is in the best interests of the Agency. Each of the criteria identified in Exhibit II-11 is summarized below.

Consistent with agency priorities: The problem solved by the candidate system must be consistent with mission requirements and Agency priorities or it is unlikely that sufficient staff and financial resources will be found to sustain system operation over time.

Sufficient resources: At a minimum, sufficient financial or staff resources must be available to conduct the Feasibility Study or there is little point in conducting the Mission Needs Study. An IPS system can be expensive. If the resources are not available to procure and maintain it, then it is unlikely the system will become a reality.

Clear statement of the problem: If the problem has not been articulated clearly, it is likely that the sponsoring office has not completely thought through the situation. Again, lack of clarity at this stage can be fatal.

Mission goals and organizational context: For the system to be a success, the sponsoring office must have articulated clearly mission goals and the organizational context so that requirements and design efforts are

correctly focused. If this is not done, the system development effort will be flawed from the start.

Proposed solutions consistent with the stated requirements: Has the sponsoring organization correctly linked the mission needs with the correct technology choices? Have any choices been overlooked? The Committee may wish to provide additional direction to the sponsoring organization in this area.

Demonstration of insight into the problem: IPS systems can be large, complex and expensive. Additionally, they often result in significant change in the business procedures of the organization. The organization must have the management and technical sophistication to manage properly the development and implementation process, or the system is likely to fail.

IPS a candidate solution for the system: If IPS does not appear to be candidate solution, then the development effort is not within the jurisdiction and interest of the Committee. Therefore, the Mission Needs Study need not be brought before the Committee for review. If IPS is asserted as a proposed solution, it should be supported by mission needs described in terms of access, storage, distribution, control and processing requirements.

Other considerations: Each system is different, and the Committee reserves the right to suggest other considerations as necessary.

Additional guidance: By providing additional guidance, the IPS Committee can insure that Feasibility Studies are performed consistently and in accordance with Agency policy.

The above criteria will be applied to evaluate the results obtained from the Mission Needs Studies. Careful attention to ensure that these issues are addressed in the Mission Needs Study will facilitate the evaluation process conducted by the IPS Committee.

Exhibit II-11

IPS Concurrence Criteria

Is resolution of this problem consistent with Agency priorities?

Are sufficient resources available to undertake the Feasibility Study?

Is the problem clearly and accurately stated?

Are organizational purpose and mission goals stated clearly and correctly?

Are proposed solution areas consistent with the stated mission needs?

Does the sponsoring organization demonstrate insight into the problem and identify steps needed to correct the situation?

Is IPS a potential solution in this case, and is that assertion supported by a description of:

1. Access Requirements?
2. Storage Requirements?
3. Distribution Requirements?
4. Control Requirements?
5. Processing Requirements?
6. External Requirements?

Are there any other considerations which should be applied to this project?

Should any additional guidance be provided to the sponsoring organization to direct the activities of the Feasibility Study?

* * * *

The Mission Needs Study determines the high level mission needs and identifies potential document management solution(s) to address the defined problem. The results of this study establish the foundation for conducting the next phase of the Systems Development Life Cycle -- Feasibility Study. The analysis for assessing the feasibility of possible solution(s) consists of four steps:

- Determine an operational cost baseline for the current document management system.
- Develop feasibility alternative(s) based on the problem and needs defined in the Mission Needs Study
- Determine feasibility alternative(s) costs providing an annualized estimate of the investment costs and operational costs
- Develop a feasibility recommendation based on the analysis of economic, financial, technological and organizational considerations.

Each of these steps is discussed in detail in the following chapter.

III. FEASIBILITY STUDY

Following IPS Committee concurrence with the conclusions of the Mission Needs Study, a feasibility study must be conducted to determine if a proposed solution can be justified within the context of existing constraints. This chapter provides an overview of the feasibility analysis process to be followed in conducting such a study.

The process, shown in Exhibit III-1, consists of four steps, and addresses the feasibility of the solution(s) approved for consideration by the IPS Committee, as a result of the Mission Needs Study process discussed in Chapter II. First, in order to form the comparative basis for determining the feasibility of the solution(s), an operational cost baseline derived from the strengths and weaknesses of the existing document management approach must be quantified. Second, based on an understanding of the existing mission needs and following IPS Committee direction concerning the scope of the proposed solution(s), a more specific alternative should be developed for the proposed solution(s). Third, an analysis of the investment costs and operational costs of the specific feasibility alternative(s) must be conducted. Estimation of operational costs will serve to reflect a substantial portion of the anticipated benefits for an alternative. Finally, other factors, such as technological and organizational issues, as well as additional mission needs unmet by the current document management approach, should then be included in the analysis to provide support for, and understanding of, the feasibility recommendation.

Exhibit III-1

Steps for Conducting the Feasibility Study

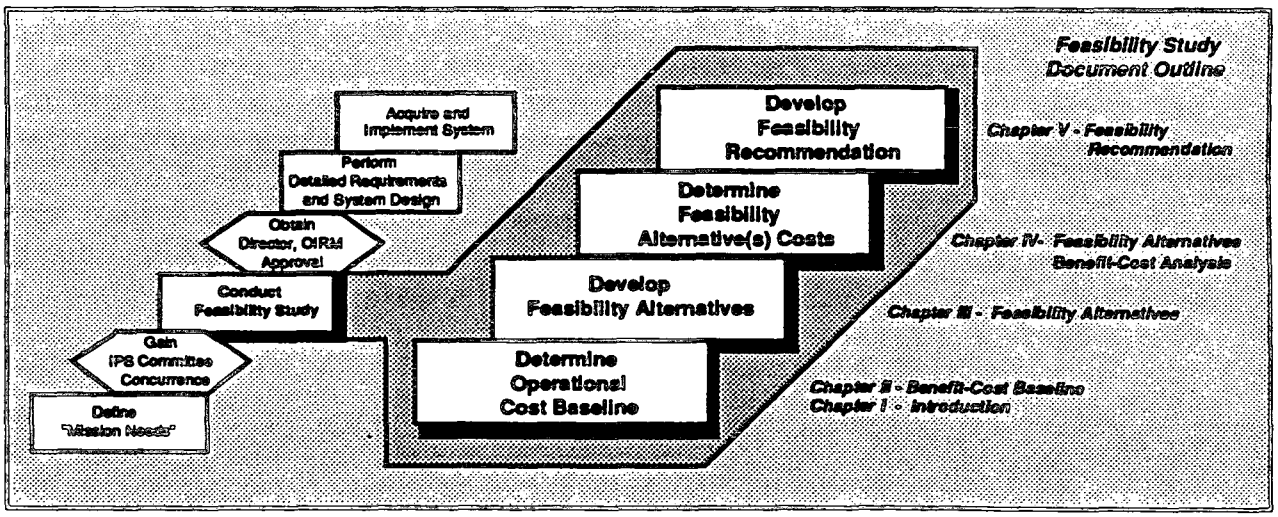


Exhibit III-2 describes the methodology that underlies this process. In order to assess the feasibility of selected alternatives, three major economic analyses must occur:

- Operational costs associated with the existing system must be analyzed and developed into an annualized baseline cost.
- Investment costs and operational costs of the selected feasibility alternative must be analyzed and developed into an annualized feasibility alternative cost.
- Annualized baseline and feasibility alternative costs must be compared primarily in terms of net present value to determine basic economic feasibility.

The result of the net present value analysis is then included with any additional intangible benefits. Other pertinent feasibility factors, such as organizational or technological issues, as well as the extent to which an alternative supports overall mission needs, also must be considered in making the final feasibility determination.

A. DETERMINE OPERATIONAL COST BASELINE

A quantitative baseline must be developed so that a proposed solution can be compared with the present document management system. This operational cost baseline information is the foundation for any economic analysis. Exhibit III-3 summarizes the minimum set of categories that should be considered in developing the annualized baseline cost. As can be seen, once the basic characteristics of the existing system have been identified, annualized storage, retrieval and processing baselines can be estimated.

The relevance of each of the major baseline cost categories – storage, retrieval and processing – to the current setting must be determined on a case-by-case basis. In each case, the baselines should serve only to reflect an *estimate* of those activities that are actually being performed within the current setting. For example, not every existing system will have extensive document processing activities associated with it; such capabilities may not even be currently possible. Some systems may serve primarily as document repositories, with only minimal retrieval requirements.

It is important to understand that the operational baseline may not reflect the full set of capabilities outlined in the Mission Needs Study; the current document management approach simply may be incapable of meeting the full set of document management needs. An awareness of the weaknesses of the current approach, as well as those needs that are currently

Exhibit III-2

Feasibility Methodology

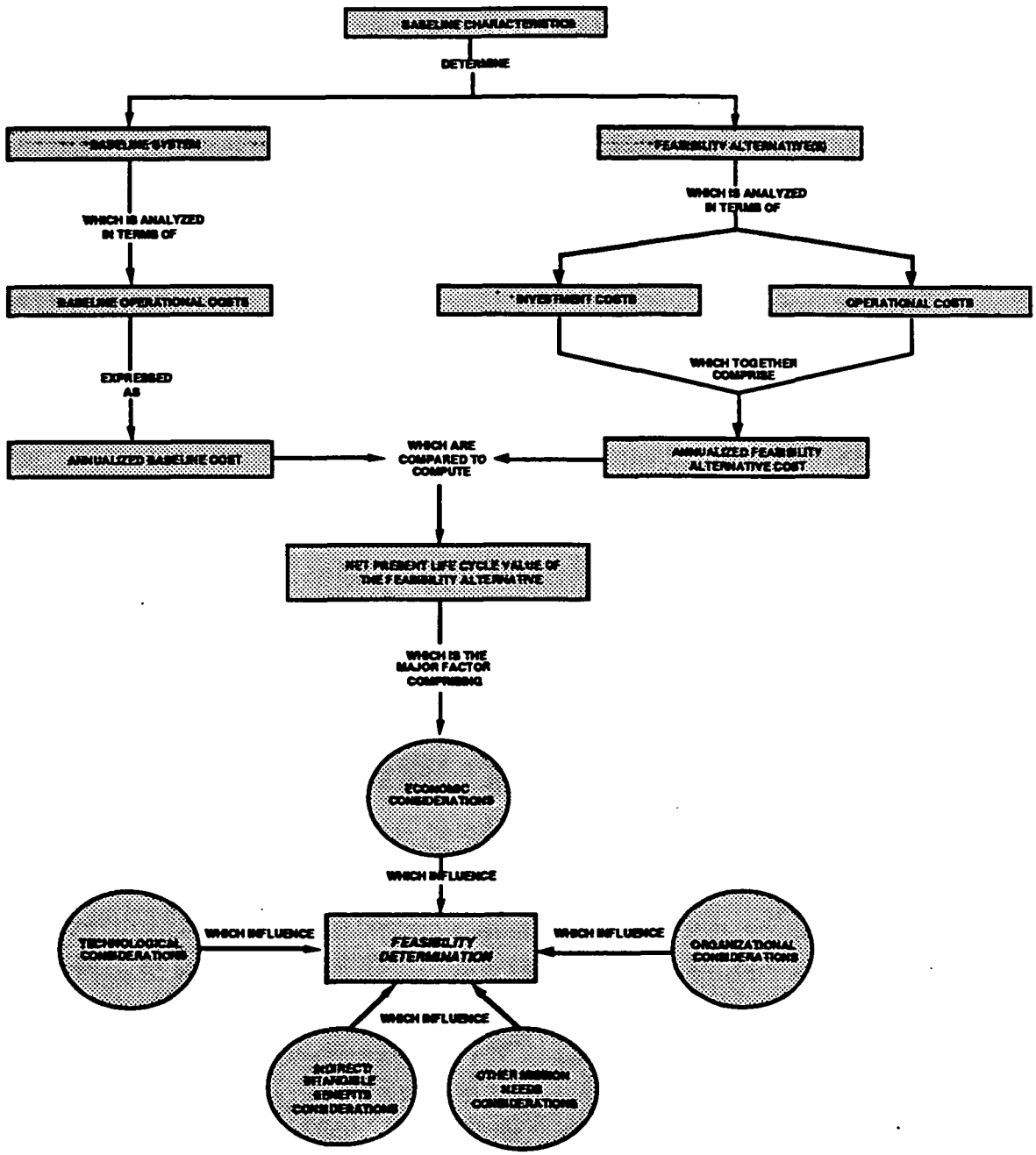
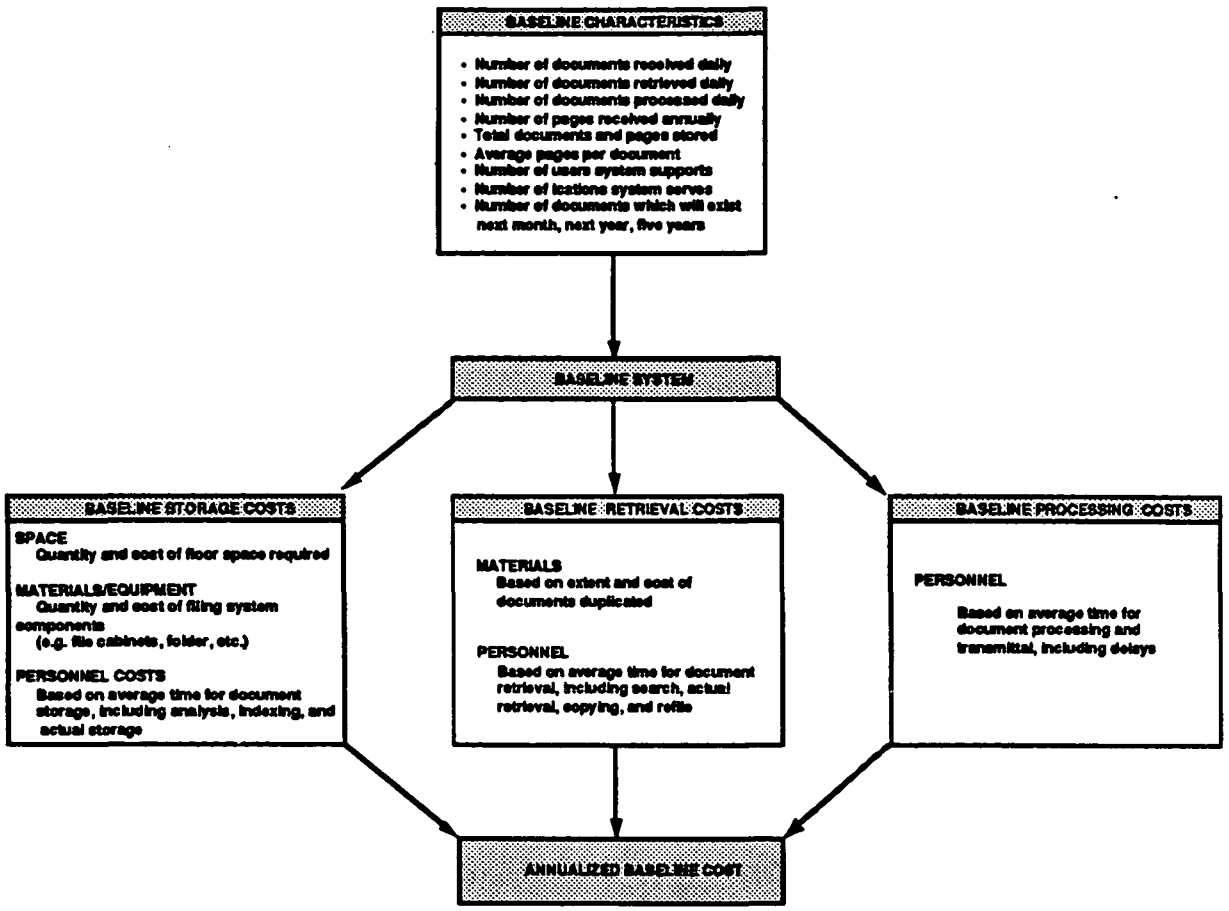


Exhibit III-3

Baseline Operational Cost Categories



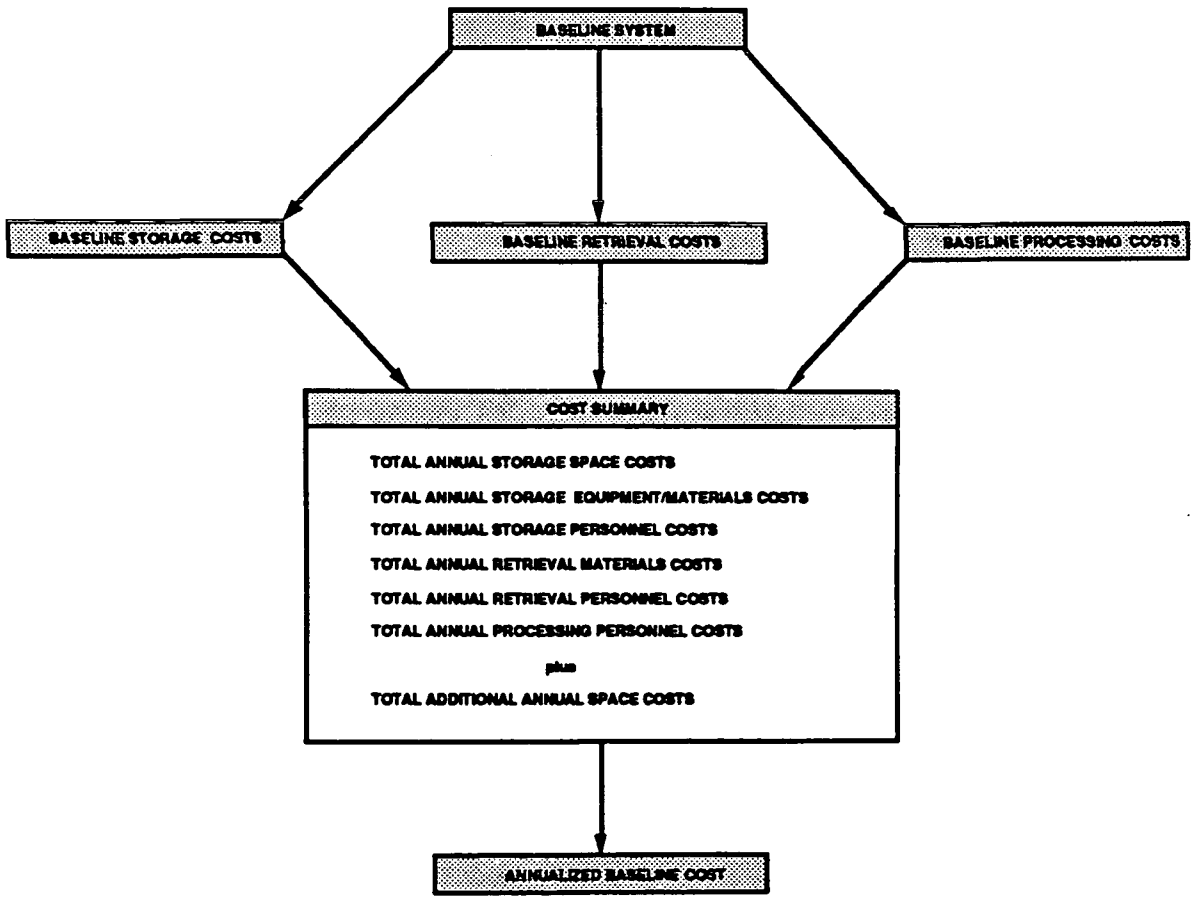
unmet, can play a significant role in determining the feasibility of a proposed solution. In fact, the correction of current weaknesses and the provision of additional capabilities is generally the primary reason for seeking approval to implement a new solution. The key consideration to keep in mind concerning the baseline system is that it serves as an *analytical* basis against which proposed solutions are compared.

Personnel costs should be estimated based on current average wage rates including overhead/fringe benefits for FTEs normally performing the indicated activity. Personnel costs are primarily determined based upon the time distribution of document handling and the amount of time associated with specific document activities. Factors that can be used to estimate space, materials or equipment costs are included in Appendix C.

Once all costs associated with each of these areas have been estimated, the total annual costs for the baseline system can be determined. Annual cost increases as the result of additional storage space costs per year should also be considered. Exhibit III-4 presents a summary format of annual baseline information required to conduct the comparative economic analysis, described below, of the selected feasibility alternatives. Any special issues that might have a significant impact on the current storage and retrieval costs, such as off-site document storage facilities or unusual retention requirements, should be considered in the baseline analysis, as appropriate. Careful attention to the external usages or interfaces required in the current system should assist in the identification of relevant factors.

Exhibit III-4

Annualized Baseline Cost Summary



Results of the operational cost baseline analysis should be presented in Chapter II of the Feasibility Report. This chapter should include a brief description of the current document management setting, its major characteristics, and the extent to which it meets overall mission needs. The baseline category estimates should be presented along with any major assumptions or unusual conditions that impact the overall baseline.

B DEVELOP FEASIBILITY ALTERNATIVES

The process described in Chapter II of this guidance document should result in one or more proposed solutions with the potential to address the identified requirements. The IPS Committee may provide additional direction as to the type, scope and complexity of the alternatives to be considered for feasibility analysis. In addition, determination of the operational baseline should provide a clearer understanding of the problem to be resolved by the selected feasibility alternative(s). Therefore, three key factors influence the development of feasibility alternatives:

- High-level requirements developed for the Mission Needs Study
- Direction provided within the IPS Committee concurrence
- Understanding gained through analysis of the current problem.

The purpose of this step is to take these key factors into consideration and, together with information about applicable technologies, develop one or more alternatives sufficiently detailed to allow a meaningful analysis of feasibility.

It may be helpful to think of the feasibility alternatives as an "educated guess" as to how a proposed solution could address the problem identified in the Mission Needs Study. The feasibility alternative serves only as an analytical tool for determining the effectiveness of a proposed solution as compared to the current system. Once feasibility has been determined for a particular solution, the actual implementation option may differ significantly from the alternative developed to assess feasibility. TThis can only be determined once detailed system requirements have been defined, a process that occurs only *after* the feasibility of one or more alternatives have been established.

Appendix B, Document Management Approaches, contains information that, when used in conjunction with the high-level requirements developed within the Mission Needs Study, will allow the selection and development of feasibility alternatives consistent with the direction of the IPS Committee concurrence. Appendix B presents an overview of possible technologies that facilitates a general understanding of

the fundamental characteristics of the solutions to be considered. The alternatives presented in Appendix B are not intended to be comprehensive in scope. They are however, intended to provide a range of system alternatives that can serve as a basis for developing appropriate feasibility alternatives that have been adjusted or tailored to more precisely reflect the problem resolution identified as necessary in the Mission Needs Study.

The development of feasibility alternatives represents a subjective process of matching an understanding of the problem with an understanding of potential solutions, factoring in any special direction or considerations provided by the IPS Committee. Sound judgement must be exercised on the part of the staff responsible for the feasibility study at this point. The accuracy of the feasibility analysis, and consequently its future utility within the systems development life cycle, depends on the appropriateness of the scope and complexity of the alternative(s) selected. The more accurate and comprehensive the understanding of the problem and the potential solutions, the more appropriate the selection of the feasibility alternatives. It is therefore important to acquire the best possible understanding of the various aspects and implications of each solution before developing the feasibility alternative(s).

A description of each feasibility alternative should be presented in Chapter III of the Feasibility Report. Each description should include the basic structure and components of the feasibility alternative, a summary of the anticipated strengths and weaknesses of such a configuration, and the rationale for its applicability in addressing the identified problem.

C. DETERMINE FEASIBILITY ALTERNATIVES COSTS

As with the baseline analysis, an annualized estimate of the costs associated with each feasibility alternative is necessary. Whereas the baseline analysis includes only operational costs, the feasibility alternative analysis must also address the additional investment costs that would be associated with the implementation of the alternative technology. In order to maintain consistency with the baseline analysis, it is assumed that, at a minimum, each alternative encompasses the same storage, retrieval, and processing conditions as the baseline system. Results of the cost analysis for each potential alternative should be presented in Chapter IV of the Feasibility Report.

1. INVESTMENT COSTS

Feasibility alternative investment cost categories are summarized in Exhibit III-5. Equipment costs (hardware and software if applicable), startup costs and other costs are to be estimated for each feasibility alternative.

Equipment costs are to be based on the best available component prices for the specific alternative. Appendix C contains certain cost information that can serve as an initial point from which to develop the equipment cost estimate. Hardware prices, however, may vary dramatically from vendor to vendor and may also change over time, particularly as new technologies mature. It is important therefore to verify current component costs before costing the feasibility alternative. If appropriate, leasing or lease-to-purchase options should be considered. Hardware prices should also include all costs involving component installation, power and network cabling (if appropriate) and documentation. The specific types and numbers of components will differ according to each alternative but should generally be consistent with the scope and complexity necessary to solve the identified problem.

If a feasibility alternative has a software component, its costs should include all required system, database and/or application software, and any software licensing or maintenance fees, as applicable. The cost of any necessary custom application development may vary widely, depending on the particular system or application. Development of a "workflow" document processing system could significantly increase software costs.

In addition to hardware and software costs, the startup costs associated with each feasibility alternative must be considered. Costs in this category should include an estimate of any extraordinary administrative costs incurred in the justification and procurement of the alternative, as well as an allowance for unanticipated miscellaneous expenses incurred during startup. These miscellaneous costs can be estimated at approximately five percent of the equipment costs. Other startup costs include an estimate of the costs associated with any user and system administrator training required by the alternative. These training costs generally rise as the feasibility alternative increases in scope and complexity. Finally, costs associated with the conversion of existing documents into the format required by the proposed alternative must be considered, if indicated. The overall cost of document conversion will vary significantly from alternative to alternative, both with respect to the technology selected, as well as the scope of the solution required.

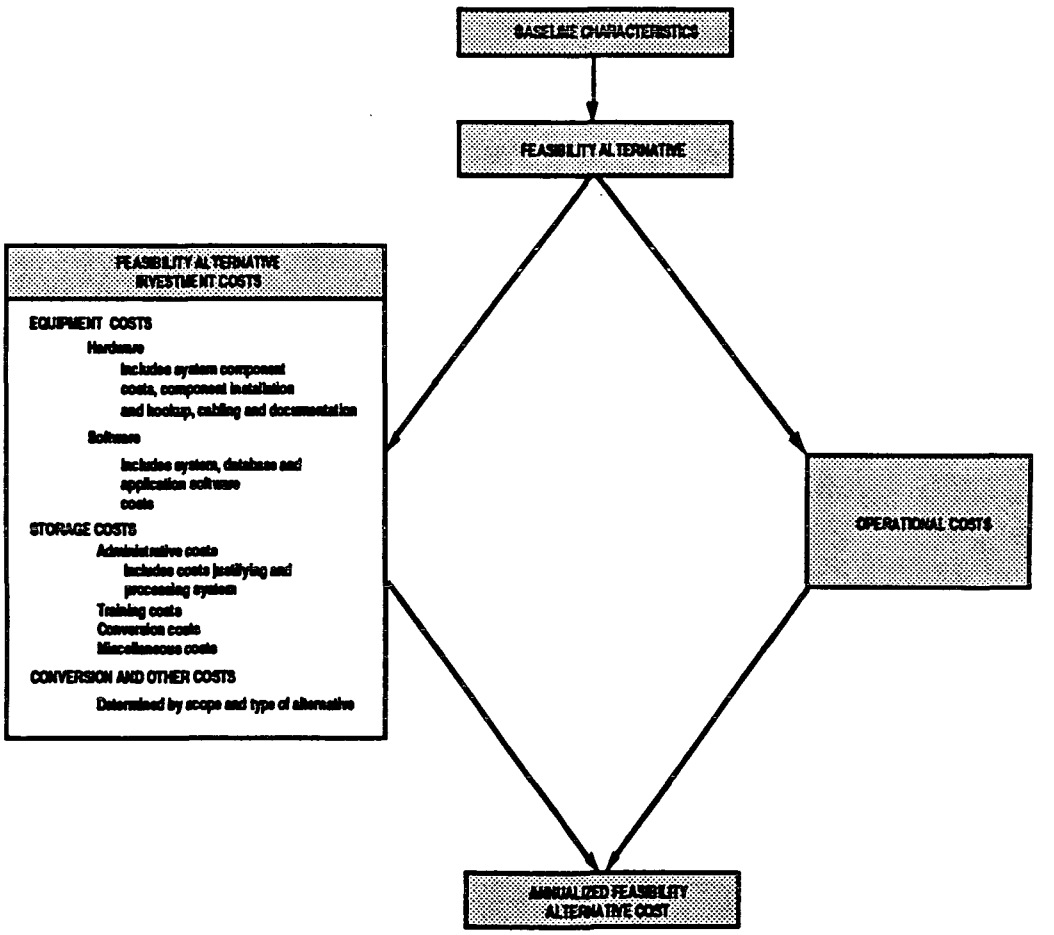
Other costs may need to be included for a given feasibility alternative. Identifying and estimating these costs, such as conversion costs, is dependent on the scope and type of the alternative(s) selected.

Conversion costs can become particularly important in determining feasibility. Some alternatives, for example, are more feasible if adopted for future use while using existing or inexpensive storage options which avoid what can be significant conversions costs.

Additional areas that warrant consideration include personnel changes or additions, particularly in document management areas; internal operational changes necessitated by the implementation of a given alternative, in order to fully capture the benefits of that alternative; impacts on existing system resources, especially if the proposed alternative is to be integrated into an existing systems environment; and, impacts on external organizations that use the existing information.

Exhibit III-5

Feasibility Alternative Investment Cost Categories



2. OPERATIONAL COSTS

In addition to developing an investment cost estimate, a quantitative estimate of operational costs associated with each feasibility alternative must be developed. Operational costs should reflect an estimate of the cost reductions in overall operations that could be anticipated through the implementation of an alternative. Exhibit III-6 summarizes feasibility alternative operational cost categories. It can be seen that these cost categories are similar to the baseline operational cost categories described in Section B, above.

Essentially, it is this similarity that ultimately enables the economic comparison of each potential alternative with the baseline system. By estimating the operational costs in similar categories, a comparable measure of the anticipated impact of the alternative can be determined. This impact, or "benefit", can be quantified relative to the operational baseline to determine if the life-cycle savings associated with the "benefit" adequately offsets the investment costs required to implement the feasibility alternative.

This approach to developing and using operational costs primarily serves to estimate direct, quantifiable costs for the purpose of the above comparison. These costs include such items as storage space costs and storage materials. However, other impacts, such as in the areas of document processing times, are indirectly addressed as well.

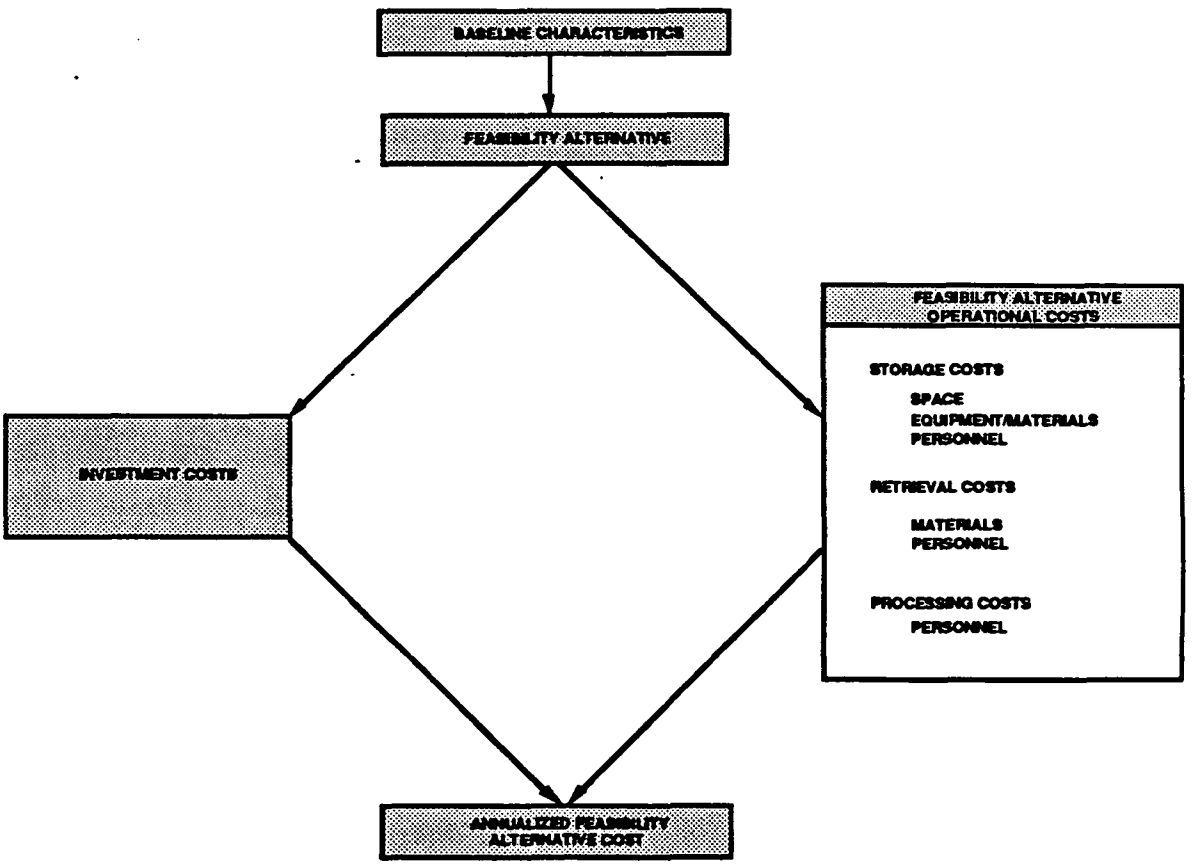
In developing the operational costs for the various alternatives, changes with respect to the baseline operational costs are of primary importance. The nature and extent of these changes will depend upon the scope and complexity of the proposed alternative itself. Careful attention must be paid to the potential for improvement in each of the cost categories. Assumptions concerning the proposed system can influence the operational cost estimate significantly. The information contained in Appendix B concerning the characteristics of potential solutions should be considered in formulating these assumptions.

Typical considerations include the reduction in space associated with micrographics storage as compared to paper systems or the fact that per-square-foot space costs for automated systems may be higher as a result of electrical or environmental requirements. In addition, media costs may differ considerably by solution. Finally, and of major importance in determining potential savings, consideration must be given to the significant changes that may occur in the area of personnel costs associated with document storage, retrieval and processing. The costs associated with document storage may remain unchanged, or be only slightly altered, due to the offsetting of the time and effort to physically label and store paper files with the effort to photograph or scan and index documents in micrographics or digitization

solutions. The costs associated with document retrieval and processing, however, may change dramatically as the technologies in proposed alternatives assume a major role in document management. document retrieval effort may be reduced as the alternative technologies enable rapid, more efficient document location and access. Document processing effort may be reduced through delays, timely association of subsequent file documents or more accurate document delivery.

Exhibit III-6

Feasibility Alternative Operational Cost Categories



3. ANNUALIZED FEASIBILITY ALTERNATIVE(S) COSTS

Once all costs associated with the categories in both the feasibility alternative operational costs and investment costs have been estimated, the total annual cost estimate of the feasibility alternative may be developed. Exhibit III-7 presents a summary format of the annual feasibility alternative information required to conduct the comparative economic analysis described in Section D, below.

D. DEVELOP FEASIBILITY RECOMMENDATION

The feasibility recommendation to the EPA managers basically consists of an assessment of economic feasibility and consideration of other factors that might influence any decision to proceed with further development of a proposed solution. The process that results in the overall recommendation includes a determination of economic feasibility primarily through net present value (NPV) analysis. Economic feasibility is augmented by considerations of technical and organizational feasibility. Additional considerations, including indirect or intangible benefits, should be addressed also, particularly when mission needs dictate solutions that are not readily cost-justifiable. Exhibit III-8 depicts the components contributing to the development of the feasibility recommendation.

The feasibility recommendation should be included as Chapter V of the Feasibility Report which is outlined in Appendix E of this document. The recommendation report should include the costs of each alternative under consideration as described in Section C, above, in support of the economic feasibility analysis. The recommendation report should also include a discussion of additional feasibility considerations described below for each alternative, as appropriate. Based on the analysis of these considerations, a specific recommendation and associated rationale should be made in the report, identifying the alternative best suited for addressing mission needs.

1. ECONOMIC CONSIDERATIONS

The economic analysis becomes useful only when the estimated costs and savings are considered in cash flow terms over the life cycle of each alternative. Savings are best understood when discounted to determine their present value, since the value of money changes over time due to factors such as inflation. Investment costs are typically incurred at the outset of a project, with benefits, or savings occurring throughout the life cycle. The life cycle of an alternative should be determined based on the type of alternative being analyzed; a six-to-ten-year range is typical.

Exhibit III-7

Annualized Feasibility Alternative Cost Summary

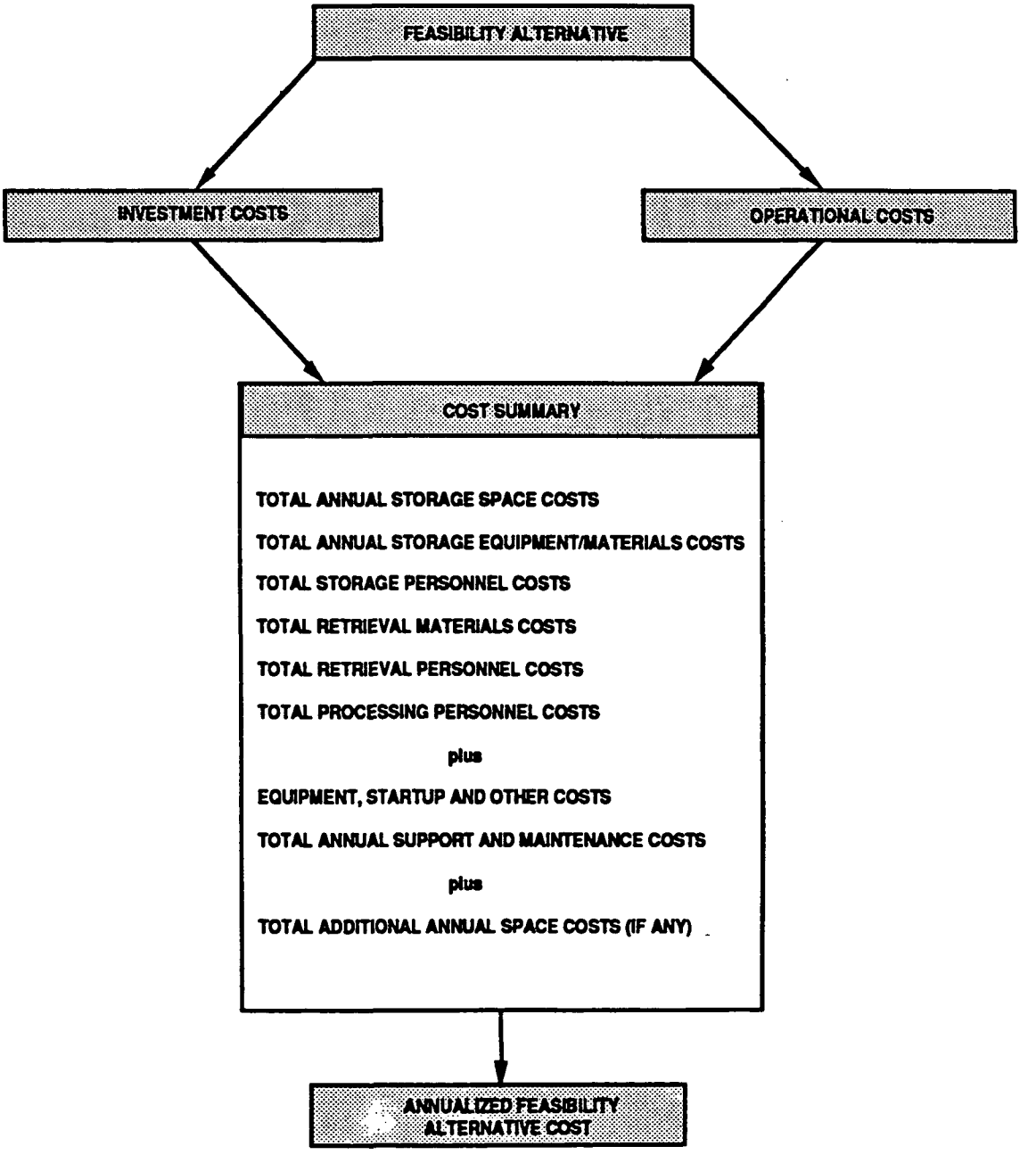
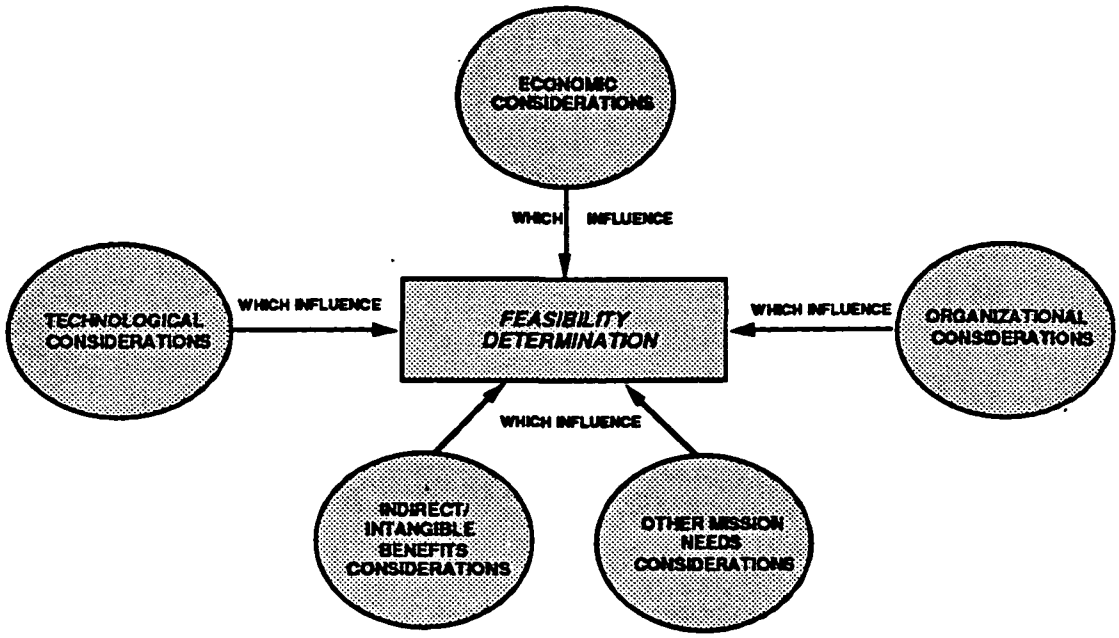


Exhibit III-8

Feasibility Recommendation Components



There are many techniques employed to evaluate the economic feasibility of a proposed alternative. The net present value technique is relatively straightforward, consisting of five steps.

1. Annual costs are listed for the existing system. These costs reflect the annualized baseline cost as described in Section A, above and should indicate any year-to-year increases, as appropriate.

2. Annual costs are listed for each potential alternative. These costs reflect the annualized baseline cost as described in section C, above. Investment costs should be included in the first year.

3. Net annual cash flows are then computed by subtracting the costs for each potential alternative from baseline costs on a yearly basis. Investment costs result in a significantly negative cash flow in the first year. It is anticipated that the cash flow would gradually improve as alternative savings are factored in annually.

4. Net annual discounted cash flows are then computed by applying the appropriate discount factor to account for the time value of money. OMB Circular A-94 directs that a discount factor of 10% is consistent

with current policy. The effect of this step is to present future cash flows in terms of current dollars.

5. A cumulative discounted cash flow is then determined, with the final cash flow amount representing the NPV of each potential feasibility alternative.

The resulting cumulative discounted cash flow, or NPV, represents a convenient way in which to examine the economic feasibility of a potential alternative as compared to the baseline system. In addition, the NPV of different alternatives can be compared as well to assist in the selection of the best approach. Exhibit III-9 presents a simplified example of NPV over a five year life cycle.

It is important to note that determination of NPV is based on many assumptions that can significantly effect the outcome of the analysis. Assumptions concerning the discount rate and the length of the life cycle are critical. Assumptions concerning whether to apply investment costs at the outset, or to amortize them across the life cycle must be made. Depreciation, if applicable, can effect the outcome, as can assumptions concerning the ultimate salvage or resale value of equipment. Finally, the assumptions that provide the rationale for the selection of a particular alternative and that underlie the entire cost collection framework will have a major influence on the ultimate NPV outcome.

Exhibit III-9

Example of Net Present Value

	Year 1	Year 2	Year 3	Year 4	Year 5
Annualized Baseline Cost	$100,000	$110,000	$120,000	$130,000	$140,000
Annualized Alternative Cost	$152,500	$75,000	$75,000	$75,000	$75,000
Net Annual Cash Flow	($52,500)	$35,000	$45,000	$55,000	$65,000
Net Discounted Annual Cash Flow		$29,000	$34,000	$38,000	$40,000
Cumulative Discounted Cash Flow	($52,500)	($23,500)	$10,500	$48,500	$88,500
Net Present Value					$88,500

Once NPV has been determined, return on investment (ROI) may be computed, if deemed necessary. ROI also is useful in comparing different alternatives. ROI is the percentage return for an alternative based upon the present value of the estimated cost savings, or benefits, that result from its implementation. In the example given in Exhibit III-9, ROI would be computed as NPV divided by alternative investment cost [(($88500/$77500) - 1)* 100%] or, a 14% return on investment over the life cycle of the feasibility alternative. Traditionally, a 10% ROI is considered the minimum acceptable limit for OMB approval of system acquisitions.

2. NON-ECONOMIC CONSIDERATIONS

While economic feasibility analysis serves as the primary influence in the development of a feasibility recommendation, additional intangible factors often sway the balance in favor of one atlernative or another. As with many other elements of this process, these non-economic considerations are "checks on reality" and will vary greatly from alternative to alternative. This final section is intended only to present a brief overview of some areas of possible importance.

Technical feasibility considerations should come into play particularly when an alternative under consideration involves new or unproven technology. Extremely complex solutions also should be examined in this light. Sometimes technology may not have matured to the point of providing a reliable, effective solution, as in the current capabilities to efficiently perform machine reading of handwriting. Complex alternatives may have to be reevaluated and broken down into smaller, more manageable alternatives with a vision toward integration at some future time.

Each potential alternative also should be examined against the structure and culture of the organization. Implementation of an alternative may result in unacceptable organizational changes, such as the elimination of a work unit or the absorption of one unit into another. Other organizational factors must be considered, including the availability of personnel with the technical competency to utilize the new system and a willingness to make necessary procedural changes. Management support must be available at all levels so that adequate resources are provided to insure the success of the implementation. Awareness of these and other organizational factors, including the availability of funding for the proposed alternative, are among the important considerations to be included in the feasibility analysis.

Finally, numerous other benefits may result from the implementation of the potential alternative. However, many of the benefits may not be readily quantifiable or may not be realized in the initial phases of implementation because significant changes in the organization's business practices may be necessary first. Even so, these benefits may be of considerable

importance to overall feasibility determination. Examples of these indirect or intangible benefits include:

- Improvements in management ability to distribute, monitor, and control workload
- Reductions in clerical document management errors
- Improved document integrity and security
- Improved employee morale and retention rates, particularly at the clerical level
- Increased opportunities to integrate the new system with existing systems, thereby providing better organizational information access, with possible further cost reductions
- Improved timeliness and quality in responding to external "customer" information requests
- Increased opportunities for streamlining operations
- Increased flexibility in staff utilization
- Increased opportunities to implement standards
- Reduction or improvement of off-site (archival) document management storage.

While it may not be possible to quantify these benefits and include them in the economic analysis, they nevertheless should be examined, presented as perceived strengths and weaknesses of each alternative, and incorporated as part of the feasibility recommendation, as indicated in Appendix E.

Finally, the capabilities provided by a potential alternative may meet a specified need that cannot otherwise be met; or, the capabilities provided by an alternative may greatly exceed the capabilities of the baseline system in meeting the full set of mission needs. In such cases, these considerations should become significant factors influencing the feasibility determination.

Appendix A

Document Management Framework

APPENDIX A: DOCUMENT MANAGEMENT FRAMEWORK

Tables A-1 through A-5 compare three primary document management solutions -- a manual paper-based process, a micrographic process and a document image processing solution. The tables show the relative efficiency with which each of these three solutions satisfies document management requirements in five major categories. The requirement categories pertain to a general user or users' work environment and identify potential user requirement characteristics within each category. Each of the five requirement categories highlighted in a separate table and is defined as follows:

1. ACCESS TO DOCUMENTS. This category reflects the characteristics as to how many users retrieve documents, the frequency of retrieval of those documents, the attributes of the documents, portions of documents or data to be retrieved and general security and timing restrictions pertaining to the retrieval of the documents.

2. STORAGE OF DOCUMENTS. This category defines the volume of documents to be stored, whether the documents are "active" (i.e., still in effect and/or in current use) or "inactive" (i.e. no longer in effect and/or seldom used), and the retention and disposition of the documents as set by the Agency records disposition schedule.

3. DISTRIBUTION OF DOCUMENTS. This category characterizes the user(s) requirement in regard to distributing documents internal and external to an organization, the scope of the document distribution requirement, the frequency and scheduling of documents for distribution and the nature of what must be distributed (e.g., single documents, multiple documents, data/information from documents).

4. CONTROL OF DOCUMENTS. The control of documents is characterized by the level of security requirements for documents, portions of documents, selected data from documents and the extent of document accountability required by users.

5. DOCUMENT PROCESSING. Document processing is defined in terms of requirements to act upon or process documents in a prescribed manner, by a specified number of people, involving internal and/or external organizations and offices with consideration of processing time. Document processing is distinct from the category of Access to Documents because processing is implicitly "workflow" related whereas access to documents essentially represents the retrieval and display of documents.

It is assumed that the tables should reflect the general capability of a particular solution to satisfy a specific requirement, *without consideration of costs*. Another assumption is that each of the solutions considered (i.e., paper, micrographic, image processing) was optimally configured/organized for purposes of comparison. Essentially, the best manual paper solution would be compared to the best micrographic or image processing solution for a given requirement characteristic. Therefore, with all things being equal, the tables are intended to reflect the relative appropriateness of each solution.

The factors considered in assigning the relative values for each solution are:

- Effort required on the part of the user(s) to satisfy the requirement given each optimized solution
- Complexity of the solution in terms of management and control required to be exercised by the user(s)
- Comprehensiveness of the solution in terms of satisfying the specific requirement and providing additional flexibility.

The tables are not intended to suggest a hierarchy or to convey priorities of requirements or solutions. Those considerations must be left to the judgement and needs of the users. For example, the criticality of a single requirement and the selection of the most efficient solution to satisfy that requirement may outweigh all other possible solutions applicable to other requirements. This comparative consideration is reserved for EPA managers to determine the importance and value of the solution.

Table A-1

Comparison of Document Management Solutions

Access to Documents

Requirements Categories	Paper	Micro-graphics	Image Processing
Frequently	◒	◒	●
Infrequently	◒	●	●
By Single User	●	◒	●
By Multi-User	○	●	●
Sequentially by User	◒	◒	●
On Demand by Users	○	◒	●
For Specified Data	◒	◒	●
For General Information	◒	◒	◒
Within Specified Times	◒	◒	●
Restricted to Select Users	◒	◒	◒
Single Documents	●	●	●
Multiple Documents	○	●	●
Specified Portions of Documents	◒	◒	●

Key	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

Table A-2

Comparison of Document Management Solutions

Storage of Documents

Requirements Categories	Paper	Micro-graphics	Image Processing
Small Quantity	●	◒	◒
Medium Quantity	◒	●	●
Large Quantity	○	●	●
Short Period of Time (1 - 12 Months)	●	◒	◒
Long Period of Time (More Than 12 Months)	◒	●	◒
Is Discretionary by User	◒	◒	●
Is Specified by Law or Other Authority	●	◒	◒
Active Documents	◒	●	●
Inactive Documents	○	●	◒

Key	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

Table A-3

Comparison of Document Management Solutions

Distribution of Documents

Requirements Categories	Paper	Micro-graphics	Image Processing
Wide External Distribution	◒	●	●
Low External Distribution	●	◒	●
Wide Internal Distribution	◒	●	●
Low Internal Distribution	●	◒	●
Distribute Select Portions of Documents	◒	◒	●
Distribute Documents Within/At Specified Time	◒	◒	●
Distribute Data From Documents	◒	◒	●
Distribute Single Document	●	◒	●
Distribute Multiple Documents	○	●	●

Key	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

Table A-4

Comparison of Document Management Solutions

Control of Documents

Requirements Categories	Paper	Micro-graphics	Image Processing
High Security Requirement	●	◒	●
Low Security Requirement	●	●	●
Extensive Document Accountability	◒	◒	●
Limited Document Accountability	●	●	●
Security of Portions of Documents	◒	◒	●
Security of Select Data From Documents	◒	◒	●

Key	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

Table A-5

Comparison of Document Management Solutions

Document Processing

Requirements Categories	Paper	Micro-graphics	Image Processing
One Person Processing	●	○	●
Multi-Person Processing	◒	○	●
Single Office Processing	◒	○	●
Multi-Office Processing	◒	◒	●
Specified Sequence of Document Flow and/or Approval	◒	◒	●
Agency Internal	◒	◒	●
Agency External	◒	◒	●
Single Document	◒	○	●
Multiple Documents	○	◒	●
Concurrent Processing of Single or Multiple Documents	○	◒	●
Processing Completed Within Specified Time	◒	◒	●

Key	Efficient: ●	Somewhat Efficient: ◒	Inefficient: ○

Appendix B

Document Management Approaches

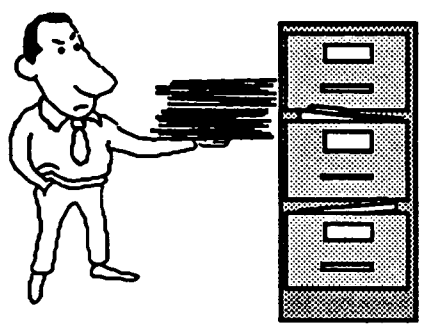
APPENDIX B: DOCUMENT MANAGEMENT APPROACHES

I. DOCUMENT MANAGEMENT SOLUTIONS

This section provides a description and characteristics of possible document management solutions that can serve as a basis for developing appropriate alternatives in the Feasibility Study. This appendix is not intended to be comprehensive in scope. Instead, the information presented provides an overview of possible technologies which should help EPA managers gain a general understanding of the fundamental characteristics of the solutions.

A. PAPER

Paper is still the most common form of information storage. This storage media has historically set the standard for convenience, cost and functionality of information transfer. The main drawback to paper is the space required to store large volumes of documents. In addition, a paper filing system can require extensive time and effort to retrieve documents and the resources required to manage the overall system can be quite expensive.



The physical characteristics of paper include a wide range of sizes, colors, thicknesses and compositions. In addition to the information stored on the document, these physical characteristics can also convey a message. As compared to other storage media, this feature is very unique. Table B-1 defines the basic advantages and limitations of paper.

The expected lifetime of a paper document depends on the type of paper used and environmental conditions in which it is stored. The life span of paper can range from a few days to hundreds of years. Many inexpensive types of paper use a high acid content which tends to deteriorate rapidly (e.g., newspaper). In addition, the ink chemicals tend to have an effect on the durability of paper. Environmental conditions such as heat, light and moisture can directly affect the life span of a document, but some forms of high-quality, acid-free paper can be expected to last for 100 years or more.

Table B-1

Paper Characteristics

Advantages:	• Standard Media for Information Transfer • Admissible as Legal Evidence • Can Handle Any Display Format and Size • Easy to Reproduce Information • Easy to Update Information • Easy to Manually Browse Documents
Limitations:	• Requires Large Storage Space • Retrieval Time May Be Slow • Large Volumes Can Be Difficult to Manage and Expensive to Move • Easy to Lose or Damage Documents • Changes May Be Difficult to Identify and Track

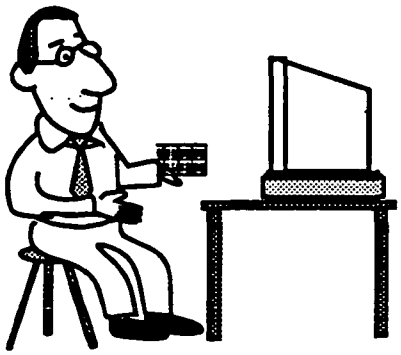
Paper storage techniques are based on the physical filing of documents involving a trade-off between file integrity and access. If an application requires the tight control of documents, access to these files is usually restricted. This commonly occurs by storing documents in a centralized location. On the other hand, if document access is a significant requirement, then copies of the original document are made and stored in decentralized locations convenient for the user. Most organizations use a combination of centralized and decentralized filing techniques. Sensitive documents are commonly stored in a centralized location with restricted access and frequently used documents are stored in multiple, decentralized locations.

Regardless of the storage and retrieval system, once the volume of paper documents exceeds the available space, obsolete or seldom-needed documents must be either disposed of or stored in a more remote location. Despite a variety of disadvantages, paper will always remain a very common and popular media for storing information.

B. MICROGRAPHICS

Micrographics uses a photographic process in which an image of a paper document is transferred by a camera onto unexposed film. The film is then exposed, developed chemically or by other methods (e.g., heat) and eventually stored in roll, cartridge or sheet form. The resulting storage

density is quite high, but, special filming, processing, reading and printing equipment are required. However, a service bureau may be contracted to perform many of these operations. Table B-2 identifies the major advantages and limitations of micrographic systems.



Micrographic systems require an optical viewer to expand the image to a readable size. These viewers are available with a variety of magnifications, screen sizes and image retrieval capabilities. Most viewers project an image of the document on a screen, and the user controls the spooling of microfilm or movement of microfiche until the desired document image is in view. Micrographics printers are available that will allow the user to produce a paper copy of the image on demand.

Table B-2

Micrographics Characteristics

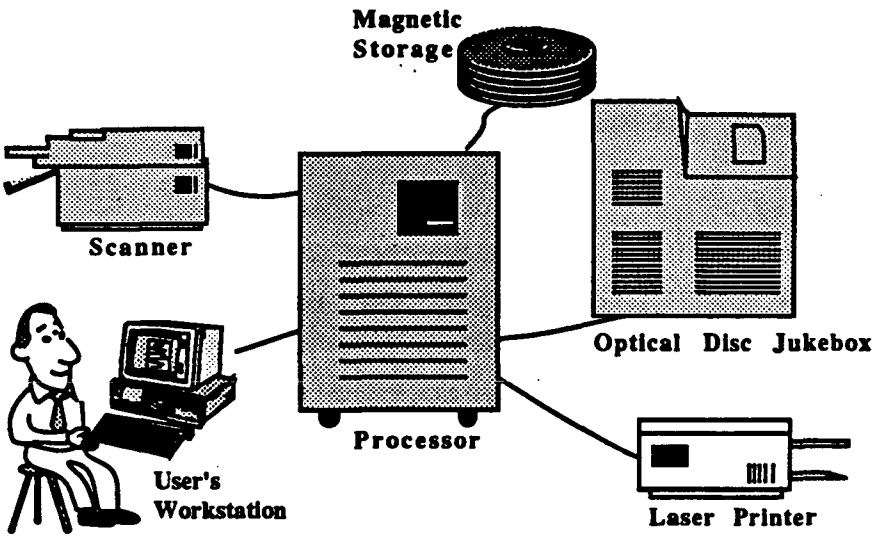
Advantages:	• High Storage Capacity
	• Admissible as Legal Evidence
	• Well Proven and Tested Technology
	• Easy and Cost-Effective to Duplicate Film
	• Can Display Most Document Formats
	• Low Conversion Costs
Limitations:	• Retrieval Time May Be Slow
	• Film May Be Difficult and Expensive to Update
	• Film Can Be Easily Lost or Damaged
	• May Be Time Consuming to Browse Documents

Micrographics has proven to be a very cost effective solution for applications having specific document storage and retrieval requirements.

This document management solution continues to be a viable technology for solving many document storage problems.

C. IMAGE PROCESSING SYSTEMS

From a broad perspective, image processing systems convert images to a digital format that can be manipulated by a computer. When an image is recorded using a digital process, it is scanned and then transformed into binary digits - ones and zeroes. This digital format can then be viewed at a computer terminal, printed, stored or transmitted to other users.



As opposed to a photographic process that can record continuous tone variations, electronic digitized images can only record a limited degree of detail. Varying degrees of both intensity and color are represented by a specific digital value. This is analogous to placing a fine window screen over an image and recording only the parts of the image that can be seen through the holes in the screen.

Virtually any media that can store digital information can be used to store digitized images. The most common forms of digital media are magnetic tapes and disks and optical disks. Digital information also can be recorded on tapes, disks or cards. A description of these media is provided in Appendix B, Section II - Document Management Alternatives. Table B-3 identifies the major characteristics of image processing systems.

Table B-3

Image Processing System Characteristics

Advantages:	• High Storage Capacity
	• Rapid Access to Documents
	• Easy to Reproduce Information on Paper
	• Difficult to Misplace or Damage Documents
	• Enhances Document Security and Integrity
	• Can Simultaneously View Single Document
	• System Can Be Easily Expanded
	• Can Integrate With Other Technologies/Systems
Limitations:	• High Equipment Costs
	• High Document Conversion Time and Costs
	• May Require Environmentally-Controlled Room
	• High Maintenance and Support Costs
	• Inability to Access Documents During System Downtime
	• No Decision on Legal Admissibility

D. Hybrid Image Processing Systems

Hybrid image processing systems use a host of various technologies that maximize the performance, efficiency and cost effectiveness of information processing for a given application. The overall solution for a given application may incorporate multiple document storage technologies (i.e., paper-based, micrographics and electronic imaging) as well as other complementary information technologies such as:

- Bar Coding
- Text Processing
- Optical Character Recognition (OCR)
- Electronic Data Interchange (EDI)
- Electronic Forms

- Network Architectures
- Facsimile Transmission
- Electronic and Voice Mail.

Hybrid image processing systems can be very appropriate where an application contains a large, diverse and complex set of requirements. For example, an application may have a wide range of information needs, consisting of text and image data, each having a unique set of requirements for storage, access, process and control. A micrographics solution may be most suitable for those documents which are archived and rarely accessed. Those documents which are needed on a frequent basis or are distributed to several persons within a office may be best supported by an electronic imaging solution operating on a local area network. In addition, these images may be transmitted using a facsimile format to field offices or external organizations. All of these technologies may be integrated in providing an overall cost-effective solution for information processing which best meets the needs of the users.

II. DOCUMENT MANAGEMENT ALTERNATIVES

This section identifies feasibility alternatives for each of the document management solutions identified above. These feasibility alternatives are organized in two categories: media type and technological complexity. In general, the media type provides the means for storing information (e.g., - paper, microfiche, optical disk). Each solution is also subdivided into feasible alternatives which are defined in various levels of technological complexity. These complexity levels range from a basic alternative providing the essential components of a technology to a more sophisticated alternative providing a higher degree of automation and functionality.

A. PAPER

Numerous techniques have been developed to improve the effectiveness of paper storage and retrieval tasks and to reduce paper storage volumes including:

- Movable filing systems using mechanical and electrical features to reduce the amount of access space needed between filing cabinets and shelves.
- Computer-based indexing systems to identify the storage location and control the distribution of paper documents.

1. Movable Filing Systems

Movable filing systems use various equipment to improve access to individual documents including rotary carousels and banks of shelves mounted on rollers. The shelves can be manually rolled in either direction to gain access to individual files. When they are not in use, entire banks of shelves can be rolled together to eliminate the space normally taken for aisles. These types of filing systems allow documents to be stored at much higher storage densities than standard paper-based systems.

Other types of paper systems use electrically operated filing drawers and shelves. An operator can simply press a button to move shelves using an electrical conveyor. This allows the operator to scan rows of documents and stop the conveyor when the desired document comes into view.

2. Computer-Based Indexing

In addition to using movable filing systems a computer data base can be added to reference the location for each of the documents. The location and description of each document can be keyed into the system, along with tracking information to identify who has a particular document when it is being used. This data base can also interface with the electrical conveyors in order to automatically retrieve a particular filing shelf.

Regardless of the level of automation incorporated into a paper-based system, once the volume of paper documents exceeds the available space, obsolete or seldom-needed documents must be either disposed of or stored in a more remote location. This basic constraint remains a primary disadvantage for paper-based systems.

B. MICROGRAPHICS

There are several alternatives available for a micrographics solution. These alternatives can offer the best combination of functionality, technology and cost for many applications. These alternatives are described below by media type and technological complexity.

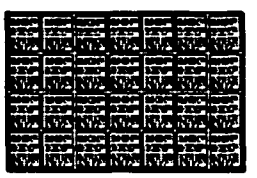
1. Media

Micrographics film can be stored in various forms including rolls, cartridges or sheets. These forms are generally categorized as four major media types: microfilm rolls, microfilm cartridges, microfiche and aperture cards. A brief description for each media type is provided below.

a. Microfilm Rolls

Using microfilm rolls, documents are sequentially photographed on a film roll typically 100 or 215 feet long using 16-mm or 35-mm film. A 100 foot roll of 16-mm film contains approximately 2,400 images containing 8 1/2" X 11" pages. The film rolls are usually stored in open reels or enclosed cartridges.

b. Microfiche



Microfiche stores photographic images of documents in a grid format on a small rectangular piece (fiche) of film. Each microfiche measures approximately 4" X 6" and typically contains up to 98 images. It can be stored at a density of about 120 sheets per inch. Many of EPA's documents are stored in this format, with one document usually stored on a single fiche.

c. Jacketed Microfilm

Jacketed microfilm uses a combination of microfilm roll and microfiche storage techniques. Standard roll film is cut to the appropriate length, based on the width of the jacket, and then inserted into clear plastic jackets containing channels for film. The photographic images are initially developed on microfilm rolls and then stored in rows similar to microfiche. This format permits relatively easy updates to a jacket by adding or removing film slides.

d. Aperture Cards

Aperture cards use a standard computer punch card to store a piece of 35-mm film. The film is mounted in a window and information can be encoded on the card in order that the image be sorted and retrieved. Although multiple images can be stored, there is commonly one image stored per card. Aperture cards are frequently used for engineering applications containing detailed architectural drawings, geographical maps, charts, etc.

Due to the archaic punch card technology, aperture card applications are now commonly being replaced with microfiche-sized aperture cards,

which allows the combined storage of large format 35 mm images and normal-sized document images.

2. Technological Complexity

Various types of micrographics systems are available that combine the high document storage densities of micrographics with the electronic capabilities of a computer. These types of hybrid micrographics systems can offer substantial improvements for storing and accessing documents. A few of these hybrid alternatives are described below including computer-aided retrieval (CAR) systems, computer output to microfilm (COM) systems and digitized microfilm systems.

a. Computer-Aided Retrieval (CAR)

CAR systems have proven to be a very effective solution for the storage of archived documents which require infrequent retrieval. During operation of a CAR system, documents are photographed on microfilm and descriptive information is entered for each document in a computer data base. A frame number or an image mark may be encoded on the film next to each image. The computer database retains the frame number or image mark and associates this information with the document description.

To retrieve the document, the descriptive information is entered, and the computer then directs an automated image reader to manipulate the film and retrieve the image associated with the document. Various types of electronic conveyors and robotic-arm mechanisms have been used to retrieve images stored on microfilm rolls, microfiche and aperture cards.

Microfilm supported by CAR systems can be a good "transition medium". Film-based images can be scanned, converted to a digital format and transmitted to an optical disk system. The computer-based film index associated with each document can be accessed through the image processing system. Older documents can then be stored and maintained on film which relieves the need to store the same images on optical disk

b. Computer Output to Microfilm (COM)

COM systems can print computer-generated data and scanned images directly onto film. This bypasses the step of producing a paper copy of the data. This type of system is very effective where large amounts of computer data or images stored on magnetic or optical media must be permanently archived. This allows the storage space on the magnetic or optical media to be freed and used again. Once the space on the storage media has been erased or overlaid with new data, the only methods available to transfer the data from

microfilm back to the digital media is to manually type the data or scan the document on film via a digital scanner.

c. Digitized Microfilm

Another type of micrographics system converts document images stored on film to digital data that can be processed by a computer. These systems are sometimes referred to as automated document storage and retrieval systems (ADSTAR) or videomicrographics systems. To facilitate rapid access to the images, the film rolls are automatically retrieved and the selected images are automatically located on the media. The image on film is then converted, via a scanner, to a digital format where a computer can electronically process and send the document to a computer terminal or printer. The image can also be transmitted over a computer network and stored on magnetic or optical media.

C. IMAGE PROCESSING SYSTEMS

Image processing systems use computer technology to convert images to digital values in order to manipulate and store the information. These digital values represent bits of information that compose text and image data.

1. Media

Using image processing systems, digitized information can be stored on magnetic and optical media. In addition, each media type can store the information on tapes, disks and cards. A description of each medium is provided below.

a. Magnetic Storage

With magnetic storage media the digital values that compose text and image information are recorded as a sequence of electrical charges on a magnetically-coated surface. Types of magnetic media include magnetic tape, disks and cards. There are wide variations in the data storage capacities and access speeds of magnetic media.

1. Magnetic Tapes

Information recorded on magnetic tape must be accessed sequentially. In order to read a record or document at the end of a tape, the entire tape must be passed through the reading device, resulting in slow access time.

Storage capacities for magnetic tape generally range from five to ten megabytes of data on a 100 foot length of tape. Because the storage capacity for magnetic tape is relatively high and the cost per tape is low, this media is best suited for data processing systems that contain a large volume of transaction processing with little or no need for random data access.

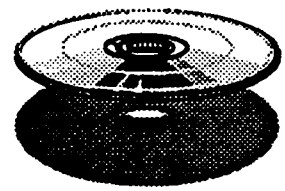
2. Magnetic Disks

Because magnetic disks rotate continuously at a high speed, information can be retrieved very quickly -- usually within a fraction of a second. However, in comparison to magnetic tape, their storage capacity is usually more limited. Magnetic disks include two types: hard disks and floppy disks. Removable floppy disks are commonly used in personal computers and provide a very portable storage media. Hard disks, compared to floppy disks, are usually not removable but generally have a much higher storage capacity.

The storage capacity for magnetic disks varies widely, depending on the size of the computer. Removable floppy disks used in personal computers generally hold from 720 to over 1,400 kilobytes of data. Hard disks can provide a higher storage capacity as a result of greater precision between the read/write heads on the disk drive unit and the media. A hard disk used by a personal computer typically holds from 20 to over 200 megabytes. Hard disks used by mini-computers and mainframe computers vary widely in storage capacities, ranging from 500 megabytes to over 2 gigabytes of data per disk.

b. Optical Storage

Optical storage media contain digital values that compose text and image information recorded by a laser light as a series of holes or bubbles on a reflective disk surface. The disks can be read by reflecting laser light from the recorded information through a detector back into a computer.



As with magnetic media, optical storage devices come in various forms including tapes, disks and cards. A common way of characterizing optical storage is by the permanence of the stored information on the media. Prerecorded storage media are those which can only be read; information cannot be added or changed after the prerecorded information has been "burned" on the media. Another category of optical media allows the user to record information one time and then repeatedly read this information. The third category of optical media is similar to magnetic media -- the user can repeatedly read, record and erase information. Some of the common media types for each of these categories are described below.

1. Compact Disk/Read Only Memory (CD/ROM)

CD/ROM contains prerecorded text or image information that can only be read, not changed. This media type grew out of the compact disks (CDs) used for audio reproductions. After a CD/ROM disk has been stamped with the information from the master disk, no information can be changed or added to that disk. This type of optical storage is very popular as a publishing medium. Many trade associations and publication companies are now distributing their periodicals on CD/ROM.

2. Write Once Read Many (WORM)

Optical storage media that allow the user to record information one time and then subsequently read this information repeatedly are called WORM devices. A WORM disk can generally hold from one to six gigabytes of data per disk. The write once nature of WORM provides a secure storage medium that prevents alteration of the document. This can provide substantial benefits for an archiving application or where documents are highly sensitive and must be tightly controlled.

3. Erasable Optical Disk

Erasable optical media generally function like magnetic media; information can be repeatedly written to and erased from the storage medium. Erasable optical disks generally store from one to four gigabytes of data per disk. Introduced in the past few years to the commercial industry, erasable optical media have become a viable alternative to magnetic media where storage requirements are very high and information must be repeatedly updated.

2. Technological Complexity

a. Storage and Retrieval Systems

Most optical disk systems are used for storage and retrieval of document images. Documents are scanned and stored on an optical disk (WORM or erasable disks) and then displayed on a monitor, reprinted, transmitted to another location or copied to another disk. After scanning, paper documents are either stored locally, archived at a remote location or destroyed.

Optical disk systems used primarily for document storage and retrieval are justified by several benefits when compared to conventional paper-based systems. These benefits include:

- *Documents can be stored at a higher density.* Depending on the resolution and compression factors, one 12" optical disk can store from 20,000 to 70,000 images and have the storage equivalent to five four-drawer filing cabinets.

- *Documents can be permanently and securely archived.* Documents cannot be changed once written to a WORM optical disk. Most vendors guarantee no significant deterioration will occur to the data on the optical disk for 10 to 30 years, assuming that the disks are stored according to manufacturer's specifications. After this period of time, the data can be transferred to another optical disk or other storage medium. An additional copy of the disk can be stored in another location to reduce the chances of image loss or damage.

- *Documents can be retrieved rapidly.* Document retrieval can usually occur in a matter of seconds. This eliminates the time commonly wasted when retrieving paper documents and also causes minimal interruption of work.

- *Documents can be filed using a cross-indexing method.* Paper-based systems usually contain documents filed by one specific index. Using a computer database documents can be searched by multiple criteria. For example, users can search for a specific document by name, date, account number, Chemical Abstract Service (CAS) number, or any combination of descriptive information. Of course, this cross-indexing method is not limited to optical storage systems, but can be used in conjunction with paper-based or micrographics systems.

- *Documents are always available for use.* In contrast to paper-based systems, documents stored on optical disk can be viewed simultaneously by multiple users located at different monitors. In addition, the document cannot be refiled improperly; something that can happen easily with a paper-based system.

- *Document security is enhanced.* Because document images are stored on optical disks, access can be controlled by physically locking the transportable disks in a filing cabinet or vault. Also, passwords can be used to limit access to the documents on the system. An audit trail can be easily incorporated that maintains detailed information relating to document access.

Compared to micrographics systems, optical disk systems can offer faster document access, improved image quality, greater storage density and simultaneous access by multiple users to a single document. These benefits

can add up to increases in productivity and efficiency. However, these benefits must be weighed against the higher equipment and startup costs for optical disk systems and the issue of legal admissibility for optical media.

b. Archival Systems

Optical storage archival systems are used primarily for the long term storage of documents requiring infrequent access. Documents are scanned and stored on optical media (usually WORM or erasable disks) at a very high storage capacity. The primary objective for an archival system is to maximize disk storage density, sometimes compromising on image quality to increase density. The design for this type of system focuses on storing the highest number of images on a disk, with limited consideration given for the time required to access and retrieve the documents.

c. Document Processing Systems

In addition to document storage and retrieval, another feature that can provide significant benefits for an optical storage system is automated document processing. This capability allows information to be added, validated or extracted from a document as it automatically passes through different stages of processing. Instead of a paper document manually following a processing path, an electronic form of the document is automatically passed from one station to the next using the computer terminal to view the document.

An optical storage system can therefore simplify and accelerate document processing activities. For example, upon entering the mail room, an application requesting approval for manufacturing a new chemical would be scanned into the optical storage system. The document would then be indexed and automatically forwarded to various computer terminals based on the review and approval processing cycle. Additional reference information from the computer data base can also be viewed on the monitor while processing the document. Once the processing cycle is complete, additional descriptive information can be added to the document index based on decisions made.

Document processing systems may offer the same advantages as those listed above for storage and retrieval systems. In addition, those systems that perform automated document processing also may provide benefits primarily as a result of the networking capabilities. These benefits can include:

- *Electronic document transmission.* Not only can documents be retrieved rapidly, they can also be transferred automatically from desk to desk. In addition, documents can be queued for processing using an electronic in-basket.

- *Pacing, sequencing, prioritizing and tracking of documents.* The pace and sequencing of work in a paper-based system is usually controlled by batches, based upon time of receipt. Yesterday's work is processed in total before today's work is begun. In contrast, an automated document processing system moves a document to the next station immediately following completion of the prior task. A time sensitive document can be expedited through the system by assigning a high priority. An electronic audit trail can also be used to track documents and review progress of work.

- *Integration with other systems.* Document processing systems can be integrated with other image processing or data processing systems. As a document follows its processing path, users can simultaneously view data or documents from other systems in order to retrieve or validate needed information.

Automated document processing systems are not appropriate for all applications. Software development and maintenance costs are generally higher than basic document storage and retrieval systems. Those applications that have highly procedure oriented, time sensitive or have mandatory processing cycles for documents can gain substantial benefits using this technology.

Appendix C

Average Unit Costs

APPENDIX C : AVERAGE UNIT COSTS

(as of August, 1990)

Cost Category/Item	Unit of Cost	Unit Cost
Space	Per Sq. Ft	
Office Space		
Premium Space		$30.00
Moderate Space		$22.00
Economy Space		$13.00
Warehouse Space		$8.00
Federal Records Centers		No Charge
Paper Filing Unit		
4-Drawer Cabinet	Per Unit	$240
5-Drawer Cabinet	Per Unit	$330
Lateral Shelves (5)	Per Unit	$630
Mobile Track Shelves	Per. Ft.	$16
Carousel Shelves (7)	Per Unit	$1,200
Microform Equipment	Per Unit	
Microfiche		
Reader		$150
Reader/Printer, Low Volume		$2,000
Reader/Printer, High Volume		$10,000
Microfilm Cartridge		
Reader		$1,200
Reader/Printer, Low Volume		$6,000
Reader/Printer, High Volume		$15,000
Storage Carousel, 480 Cartridge		$550
*IPS Equipment	Per Unit	
Level I Host Computer		$331,969
Level II Host Computer		$205,193
PC Workstation		$9,682
Scanner		$7,025
Printer (Printronix Laser)		$12,887
Printer (4216 Laser)		$1,446

Cost Category/Item	Unit of Cost	Unit Cost
Furniture	Per Unit	
Equipment Table		$400
Reading Table		$400
Chairs		$165
Personnel Costs	Annual Salary (Step 5)	
GS - Level 1		$11,990
GS - Level 2		$13,053
GS - Level 3		$14,714
GS - Level 4		$16,517
GS - Level 5		$18,481
GS - Level 6		$20,598
GS - Level 7		$22,887
GS - Level 8		$25,351
GS - Level 9		$28,001
GS - Level 10		$30,834
GS - Level 11		$33,875
GS - Level 12		$40,601
GS - Level 13		$48,281
GS - Level 14		$57,054
GS - Level 15		$67,112

* - A detailed listing of the prices for IPS equipment is available in the *Image Processing Systems: Implementation Guidance -- Part I IPS Contract Hardware, Software and Services Description.*

Appendix D
Mission Needs Study Document Outline

APPENDIX D: MISSION NEEDS STUDY DOCUMENT OUTLINE

I. INTRODUCTION

- A. PURPOSE OF STUDY
- B. INFORMATION SOURCES

II. ORGANIZATIONAL MISSION

- A. PURPOSE AND ROLE
- B. GOALS, OBJECTIVES AND FUNCTIONS
- C. STRUCTURE, REPORTING HIERARCHY

III. CURRENT DOCUMENT MANAGEMENT SYSTEM DESCRIPTION

- A. PURPOSE, OBJECTIVES AND FUNCTIONS
- B. DOCUMENT MANAGEMENT PROFILE
- C. PROCESS FLOW DIAGRAMS
- D. SYSTEM STRENGTHS AND WEAKNESSES

IV. PROBLEM DEFINITION

- A. PROBLEM STATEMENT
- B. DEFICIENCIES

V. MISSION NEEDS

- A. DOCUMENT ACCESS
- B. DOCUMENT STORAGE
- C. DOCUMENT DISTRIBUTION
- D. DOCUMENT CONTROL
- E. DOCUMENT PROCESSING

VI. POSSIBLE DOCUMENT MANAGEMENT SOLUTION(S)

A - N <SOLUTION NAME>

For each solution, provide the following:

1. ***Description***
2. ***Rationale***

Appendix E

Feasibility Study Report Outline

APPENDIX E : FEASIBILITY STUDY REPORT OUTLINE

I. INTRODUCTION

Summary of High Level Mission Needs.

II. BENEFIT-COST BASELINE

For the Baseline System, provide the following

A. CURRENT DOCUMENT MANAGEMENT SETTING AND MAJOR CHARACTERISTICS

B. BENEFIT-COST ESTIMATES EXPRESSED AS OPERATIONAL COSTS

III. FEASIBILITY ALTERNATIVES

A - N <ALTERNATIVE NAME>

For each Feasibility Alternative, provide the following

1. ***Basic Configuration***
2. ***Strengths and Weaknesses***
3. ***Applicability Rationale***

IV. FEASIBILITY ALTERNATIVES BENEFIT-COST ANALYSIS

For each Feasibility Alternative, provide the following

A - N <ALTERNATIVE BENEFIT-COST ANALYSIS>

(Expressed as Investment and Operational Costs)

V. FEASIBILITY RECOMMENDATION

A. COMPARATIVE ECONOMIC FEASIBILITY

(Expressed as NPV/ROI)

B. OTHER CONSIDERATIONS

For each area below, provide a comparative discussion of the relevant aspects of each potential alternative, as appropriate

1. *Organizational Feasibility*
2. *Technical Feasibility*
3. *Intangible/Indirect Benefits*
4. *Mission Needs Considerations*

C. OVERALL RECOMMENDATION

Appendix F

IPS Policy Document

OIRM POLICY DIRECTIVE 90-01
10/24/90

IMPLEMENTATION OF IMAGE PROCESSING SYSTEMS

1. PURPOSE. This policy establishes the principles that govern the acquisition and use of image processing systems (IPS). This policy also defines the roles and responsibilities for implementing these principles.

2. SCOPE AND APPLICABILITY. This policy applies to all EPA organizations and their employees. It also applies to the personnel of EPA agents (including contractors) who are involved in the design, development, acquisition, operation and maintenance of Agency image processing systems.

3. BACKGROUND AND OBJECTIVES.

   a. EPA is committed to improving records management and has determined that computer technology for storage of image and text data is an important capability for achieving improvements.

   b. Agency contracts have been established for the acquisition of image processing systems (IPS) to ensure conformance to Agency standards and to promote compatibility, information sharing and responsible management of advanced technology.

   c. Successful implementation of image processing systems requires evaluation of both the records management program and the technical design of integrated hardware and software environments. Programs which demonstrate well-organized and effective records management programs often have the potential to further improvement through the innovative application of computer technology. Programs with records management problems should not implement image processing systems or other technologies before addressing fundamental policy, procedural and support issues for managing their records more effectively.

d. The objectives of this policy are to:

(1) Improve the effectiveness of EPA records management programs and increase access to information resources in a manner that enhances staff productivity and program effectiveness.

(2) Manage official government records in accordance with appropriate Federal legislation, regulations and guidance.

(3) Oversee the development and implementation of image processing systems consistent with the Agency's strategies, priorities and applicable policies and guidance for information systems.

4. AUTHORITIES.

a. EPA 2100-- Information Resources Management (IRM) Policy Manual (7/21/87).

b. Federal Records Act of 1950, as amended (44 U.S.C. 3101-3107).

c. Paperwork Reduction Act of 1980, as amended.

d. OMB Circular A-130, Management of Federal Information Resources.

5. POLICY. It is EPA policy that all applications requiring the use of image processing systems must be approved by the Director, OIRM. Approval shall be obtained in a two-step process through EPA's Image Processing System (IPS) Committee. At the earliest stage, the Committee shall concur in concept with an image processing solution based upon a Mission Needs Statement (See EPA's "System Design and Development Guidance," June 1989) before investment is made in a more thorough assessment of requirements and feasibility in a Preliminary Design and Options Analysis. In the next step, the Committee shall evaluate the results of the Preliminary Design and Options Analysis and forward its recommendation for consideration by the Director, OIRM. The Director, OIRM, shall approve, disapprove or direct additional analysis before the procurement of an IPS system or Detailed System Design, Development and Implementation phase of the system lifecycle may begin.

a. EPA must assess whether an image processing system is a reasonable solution to pursue in meeting an EPA organization's needs to strengthen records management capabilities in order to improve overall program effectiveness.

b. EPA must weigh the benefits and costs of alternative problem-solving approaches. Alternatives include paper, microform and electronic digital media. Image processing systems are powerful, but they are not necessarily the best solution to every organization's records management needs.

c. EPA must ensure coordinated national development and management of electronic records management systems, especially systems with information of "corporate" value which should be shared in a meaningful form within EPA and with our domestic and international partners in environmental protection.

d. EPA recognizes that as computer technology for capturing, storing, processing and retrieving information in image form is evolving rapidly, EPA must evaluate Agency requirements continuously to ensure the availability of responsive technology options.

6. RESPONSIBILITIES.

a. The Director, OIRM, shall evaluate recommendations of the IPS Committee and approve or disapprove requests for image processing systems based upon the results of a Preliminary Design and Options Analysis which evaluates the requirements and feasibility of image processing solutions.

b. An Image Processing Systems (IPS) Committee, chaired by the Deputy Director, shall:

(1) Advise the Director, OIRM, on the overall strategic development, implementation and management of image processing systems and technology in the Agency.

(2) Develop and promulgate policies and guidelines governing Agency image processing systems (IPS).

(3) Be advised and keep abreast of EPA initiatives and activities in evaluating and developing image processing systems.

(4) Concur in concept based upon a Mission Needs Statement before any EPA organization invests in a more detailed feasibility study through a Preliminary Design and Options Analysis for IPS.

(5) Offer recommendations to the Director, OIRM, on the merits of an IPS request based upon a Preliminary Design and Options Analysis.

c. The Office of Information Resources Management (OIRM) shall:

(1) Develop and promulgate policy and guidelines governing Agency image processing systems (IPS).

(2) Provide guidance to Assistant Administrators, Associate Administrators and Regional Administrators in implementing the requirements of this policy.

(3) Provide technical advice and assistance to the EPA in evaluating how computer technology can improve records management and in developing and managing image processing systems.

(4) Review and approve studies, proposals and associated procurement requests in cooperation with NDPD for automation of records management activities that ensure consistency with Agency policy for records management and information systems.

d. The Office of Administration and Resources Management-RTP (OARM-RTP) and the National Data Processing Division (NDPD) shall:

(1) Develop hardware, telecommunications and systems software requirements for image processing systems.

(2) Establish and manage EPA contracts for the acquisition, implementation and support of image processing systems.

(3) Review studies, proposals and associated procurement requests in cooperation with OIRM to ensure that proposed image processing systems or other selected technologies are properly used and comply with the requirements of this policy.

(4) Provide technical support for optical disk-based image processing systems, including acquisition, implementation and operational support.

e. Assistant Administrators, Associate Administrators, Regional Administrators, the General Counsel, and the Inspector General shall ensure that the acquisition, installation and management of image processing systems under their direction are in accord with this policy.

f. The Senior Information Resources Management Officials (SIRMOs) shall:

(1) Review system design and development analyses for image processing systems (IPS) to be acquired and managed by their organizations in accordance with this policy.

(2) Review procurement requests and budget proposals for acquisition of image processing systems (IPS) in accordance with this policy.

7. DEFINITIONS.

a. "Image Processing System" (IPS) is the general term referring to a computer hardware and software system designed to capture, store, retrieve, display, manipulate and produce a facsimile of data which is in the form of visual images.

b. "Mission Needs Statement" is an analysis which defines the management problem to be addressed and proposes an initial system concept for more in-depth assessment as the appropriate response to the problem.

c. "Preliminary Design and Options Analysis" is an assessment of feasible system alternatives, their costs and benefits which results in selection of a system design upon which more detailed specifications for system operations, hardware, software and telecommunications are based.

d. "Microform" is based on a photographic process using camera equipment in which an image of a document is transferred onto film. The film is then stored in roll, cartridge or sheet form. The most common forms of microform are microfilm and microfiche.

e. "Electronic digital media" is a category of computer technology which captures, stores, processes and retrieves information, including text and image data. Two main types of digital storage include magnetic and optical storage. Magnetic storage contains text and image data as digital values on a magnetically coated surface. Types of magnetic media include magnetic tape, disks and cards. Optical storage contains information stored as digital values. Laser technology is used to "write" and "read" this information. Optical storage media comes in various sizes and formats, including Compact Disk/Read Only Memory (CD/ROM), Write Once Read Many Times (WORM) and erasable disks.

8. PROCEDURES AND GUIDELINES. Procedures and guidelines for the development and management of image processing systems (IPS) will be issued under separate cover.

Appendix G

IPS Committee Charter

Charter for the Image Processing Systems Committee

Objective: The Image Processing Systems (IPS) Committee is hereby chartered as a committee of the Administrative Systems Council. The purpose of the IPS Committee is to advise the Director, Office of Information Resources Management, and members of the Administrative Systems Council concerning proposals for implementation of advanced records and information management systems employing the use of digital imaging, storage and communications technologies. The IPS Committee shall:

- Promulgate policy and guidance for development and application of image processing solutions to EPA records and information management requirements;
- Provide advice and assistance to EPA offices in the conduct and evaluation of Mission Needs Statements, Preliminary Design and Options Analyses and System Design, Development and Implementation studies to ensure compliance with Agency policies regarding life-cycle cost/benefit analysis and major system procurement;
- Review and concur in concept on proposals for image processing systems resulting from Mission Needs Statements before EPA offices invest in more extensive Preliminary Design and Options Analyses to assess the feasibility of image processing solutions;
- Approve and guide the procurement and implementation of image processing systems in a manner consistent with accepted and approved system design, as well as Agency strategic information management goals and priorities;
- Ensure that image processing system procurements are made from existing, competitive contract vehicles and that equipment and software are capable of inter-system sharing of image and index data to the maximum possible extent;
- Promote the use of digital information and image processing systems to enhance delivery of information to the public;

Support a process to continually review and evaluate technological developments in digital information and image processing which may have potential application in the Agency.

Membership and Structure: The IPS Committee is chaired by the Deputy Director, Office of Information Resources Management. Members include the following:

Director, Information Management and Services Division, OIRM
Director, Administrative Systems Division, OIRM
Director, Program Systems Division, OIRM
Director, Financial Management Division, OC
Director, Information Management Division, OTS
Director, National Data Processing Division, RTP-OARM
Project Manager, Superfund Image Processing System, RTP-OARM
Project Manager, IPS Contract, RTP-OARM
Assistant Regional Administrator for Policy and Management - Region III
Assistant Regional Administrator for Policy and Management - Region IV

Other representatives may be added by the Deputy Director, OIRM, from headquarters and regional offices, as well as private contractors. The role of all members is that of advancing the Agency's goals for information management and assistance in implementing IPS in the Agency in a responsible and productive manner, rather than representing their particular organization.

Operation: The IPS Committee shall conduct its activities through:

- Monthly meetings for approximately the first six months, with quarterly meetings thereafter

- Ad hoc meetings -- on its initiative or at the request of a member, the Chair may call meetings and/or arrange teleconferences to consult on specific issues that require special attention.

- Subcommittees -- the Chair, acting on behalf of the members, may establish subcommittees to identify and explore focused technical or information management issues pertinent to image processing system implementation. Such subcommittees may be required to conduct or issue specific program or policy analyses or position papers.

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