GAO

ADP MODERNIZATION

IRS' Tax System Redesign Progress and Plans for the Future

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Information Management and
Technology Division

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The Honorable Dennis DeConcini
Chairman, Subcommittee on Treasury,
   Postal Service and General Government
Committee on Appropriations
United States Senate

The Honorable Pete V. Domenici
Ranking Minority Member, Subcommittee on Treasury,
   Postal Service and General Government
Committee on Appropriations
United States Senate

The Honorable J. J. Pickle
Chairman, Subcommittee on Oversight
Committee on Ways and Means
House of Representatives

In response to your requests, we have continued to review
the Internal Revenue Service's (IRS) Tax System Redesign, a
major program to overhaul the tax administration system.
This report describes the redesign's plans and initiatives,
along with oversight agencies' comments and concerns about
the redesign. Further, it documents a March 1, 1988,
briefing to the staff of the Subcommittee on Oversight,
Committee on Ways and Means, House of Representatives (see
attached appendixes for details). As IRS progresses with
Tax System Redesign, we plan to provide you with further
information regarding this important program.

IRS' current automated data processing (ADP) systems are
outdated and inefficiently designed, hindering high quality
service. To improve the efficiency and effectiveness of
these systems, IRS initiated Tax System Redesign in 1982.
Since then, the agency has pursued four different conceptual
redesign approaches, ranging from private industry design
and implementation of a new system to an in-house developed
system.

The first three approaches did not go beyond the conceptual
phase for several reasons. Among the reasons were

leadership changes within IRS and Treasury that redirected the redesign strategies. Further, the initial redesign strategies were challenged because they were not tied clearly to IRS mission needs.

The fourth and current approach depends on the agency's own staff, complemented by outside technical help. IRS has described the redesign approach as evolutionary, meaning that discrete improvements will be made incrementally to the current system until redesign objectives have been met.

Since spring 1987, IRS has made progress in initiating the groundwork for planning, analyzing, and managing the redesign effort. IRS approved, in March 1988, a Tax System Redesign management plan. This plan describes organizational responsibilities and the preliminary design concepts for a redesigned tax processing system.

IRS' management plan describes how the redesign will be implemented by an IRS-wide organizational effort. The Assistant Commissioner for Information Systems Development is responsible for ensuring that all redesign initiatives and projects are integrated and fit into an overall system design concept. This Assistant Commissioner is also responsible for managing the development of selected redesign projects, which generally meet the data processing needs of several functional areas within IRS. Other Assistant Commissioners, such as those responsible for examination or collection, will manage the individual redesign projects that directly support their functional areas.

The plan also describes the agency's preliminary redesign concepts. The concepts consist of three different levels of automation: (1) large corporate data bases of information needed by most functional areas throughout IRS, (2) departmental data bases needed generally by only one functional area such as collections or examinations, and (3) systems to provide automated support for specific local offices.

The agency has decided to implement these levels of automation incrementally using a two-phased approach. The first phase, called the interim architecture, is scheduled to be completed by 1993-1994. The second phase, called the target architecture, is expected to be completed by 1998. Within the interim architecture, IRS plans to reduce the paper-based manual functions by modernizing input processes

and storage capabilities, provide authorized employees with on-line inquiry to selected master files of taxpayer information, and develop departmental automated data processing systems. Under the target architecture, the agency plans to install a telecommunications network and redesign the master files to allow authorized IRS employees to not only request information, but update taxpayer information promptly.

The agency has begun work towards the interim and target architectures. IRS is developing management controls to coordinate the redesign's multiple, interdependent initiatives for achieving these architectures. Technical assistance will be obtained from contractors to support data planning, systems documentation, and system engineering. In addition, the agency has begun work in other areas critical to the redesign's success, such as developing standards, identifying security measures, and conducting technical analyses.

IRS has described its redesign plans to oversight agencies—the Department of Treasury, General Services Administration (GSA), and Office of Management and Budget (OMB). These oversight agencies are supportive of IRS' plans and progress. As IRS has developed its preliminary design concepts, the oversight agencies have raised concerns that IRS is continuing to address. Concerns have focused on the complexity of designing, procuring, and integrating such a large program. Specifically, during the next year Treasury will be seeking more information about the redesign program's costs, milestones, and how individual projects support the management plan. GSA wants to ensure that the acquisition strategy results in effective, timely procurements. And finally, OMB believes more work is needed to identify relationships among the numerous projects and to identify the critical paths to be followed during the redesign. Further, OMB has requested IRS to complete alternative analyses to provide direction for the redesign.

Over the next 2 years, IRS plans to perform cost/benefit analyses for several different system design alternatives, complete and obtain approval of its acquisition strategy, and define user requirements. Completing these and other critical tasks should provide the basis for assessing the technical viability of the preliminary design concept, as well as the strategy, schedule, and costs for the program. These actions will also help answer critical redesign questions, such as how many processing sites are needed and
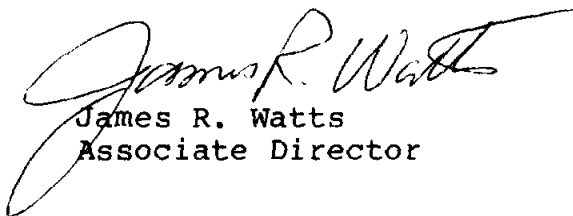
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what type of telecommunications network should be used to connect service centers and processing sites.

To meet our objective of describing Tax System Redesign's plans and progress, we reviewed IRS' October 1987 draft management plan and related redesign documents. We interviewed the agency's contractors and consultants, as well as knowledgeable officials to understand the basic approaches and concepts IRS will follow to redesign an integrated tax administration system. To determine oversight agencies' comments and concerns about the redesign, we met with OMB, GSA, and Treasury officials. We also attended a briefing IRS held for OMB and reviewed correspondence between the two agencies.

Audit work was conducted from November 1987 through March 1988. We briefed IRS officials on February 29, 1988, and incorporated their comments where appropriate. We performed our work in accordance with generally accepted government auditing standards.

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As arranged with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from its issue date. We will then make copies available to others upon request. If you have any questions or desire additional information, please contact me or Mary Ellen Chervenic, Group Director, at 275-3455.

James R. Watts
Associate Director

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ABBREVIATIONS

ADP	automated data processing
GAO	General Accounting Office
GSA	General Services Administration
IMTEC	Information Management Technology Division
IRS	Internal Revenue Service
OMB	Office of Management and Budget

Tax System Redesign Historical Perspective

- IRS initiated Tax System Redesign in 1982 to address its data processing problems. Major problems include

  -- Limited data access

  -- Reliance on manual- and paper-intensive processes

  -- Lack of system integration

- Since 1982, IRS has unsuccessfully pursued three conceptual redesign approaches

  -- Using Office of Management and Budget guidance on major systems acquisitions

  -- Contracting with a systems integrator to develop system design

  -- Combining, through an in-house effort, new hardware with software to modernize the master file

- The first three approaches never proceeded beyond the conceptual stage because

  -- Numerous leadership changes occurred in IRS and Treasury

  -- Officials had different ideas about the redesign and urged redirection

  -- Redesign strategies were challenged as not supporting IRS-wide mission needs

  -- Redirections hampered redesign progress

- IRS' Assistant Commissioner, appointed in October 1986, begins fourth redesign approach

  -- Evolutionary/incremental approach

  -- Tax System Redesign management plan describes approach

TAX SYSTEM REDESIGN HISTORICAL PERSPECTIVE

In 1982, IRS initiated Tax System Redesign to address its data processing problems. IRS stated that its "systems are inefficiently designed, difficult to maintain, and unable to take advantage of the features of state-of-the-art equipment." The agency has pursued four different redesign approaches, ranging from contractual to in-house design and development of a new system. The first three approaches did not proceed beyond the conceptual phase, partly because leadership changes within IRS and Treasury hampered redesign attempts. Also the initial redesign strategies were challenged as not being tied clearly to the mission needs of IRS. IRS is currently pursuing an evolutionary approach, which will incorporate ongoing initiatives, to the extent possible, into the new redesigned process, providing a tax system governing IRS-wide initiatives.

IRS has recognized that its inefficient automated data processing prevented it from providing high quality service. The system relies heavily on manual- and paper-intensive processes, resulting in slow and unreliable data input and retrieval. It involves an inefficient, time-consuming process; taxpayers submit paper tax returns to service centers, and employees extract summary information from the returns and convert the data to machine readable form. Tapes containing this data are flown from the ten service centers to the National Computer Center in Martinsburg, West Virginia, to update the master file of tax account data. Master file data are also stored on tapes, and the information is neither readily accessible nor comprehensive. Selected information on the master files is extracted, put on magnetic tapes, and flown back to the service centers to answer taxpayer inquiries. While IRS has developed several subsystems to meet its growing ADP needs, these subsystems stand alone with only minimal access to the master files.

In August 1982, IRS formally established the Tax System Redesign Project. The program has maintained the following objectives: 1) introduce state-of-the-art computers and telecommunications technology, 2) provide faster access to taxpayer information, 3) better link related information, and 4) automate manual- and paper-intensive processes. From 1982 to 1986, IRS sequentially pursued three different conceptual approaches for redesigning the system, including

-- using the Office of Management and Budget Circular A-109 major systems acquisition guidelines to give private industry the opportunity to develop, refine, demonstrate, and implement a new design concept;

-- contracting with a systems integrator who would act as the prime contractor for all redesign activities (ranging from holding a design competition to implementing the new system); and

-- combining, through an in-house effort, new tax processing system hardware with software to modernize the master file.

These three redesign approaches never proceeded beyond the conceptual stage. This was due in part to numerous leadership changes in both IRS and Treasury. Various officials occupied key information technology positions during the early 1980s and brought with them differing views of how the tax administration system should be redesigned. As a result, the redesign strategy changed several times and the initial strategies were challenged as not being tied clearly to the mission needs of IRS.[1]

Through fiscal year 1986, IRS obligated and spent $15.5 million to establish and operate the redesign office, develop the redesign approaches, contract for the documentation of the current tax administration system, and test new technologies.

In October 1986, a new IRS Assistant Commissioner was appointed, inaugurating the fourth and current redesign approach. This evolutionary and incremental approach places Tax System Redesign within the larger context of IRS-wide information planning and coordination. IRS' Tax System Redesign management plan sets forth major aspects of the current redesign approach.

IRS has not estimated the current redesign's costs. However, in 1986, before the redesign's scope was expanded to include additional initiatives, IRS estimated it would cost over $1 billion between fiscal years 1989 and 1992 and $4.4 billion over the system's life through the 1990s.

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[1]For detailed information on events leading to Tax System Redesign development, see ADP Modernization: IRS' Redesign of Its Tax Administration System, (GAO/IMTEC-88-3FS, Nov. 9, 1987).

Description of Tax System Redesign

Overview of the Management Plan

• The management plan provides the framework to achieve redesign

　　-- Organizational responsibilities

　　-- Planning process

• A major portion of the management plan is the preliminary design concept

　　-- Three levels of automation--corporate, departmental, and local

　　-- Redesign will progress incrementally through the late 1990s

• IRS formally approved the plan in March 1988

DESCRIPTION OF TAX SYSTEM REDESIGN

In October 1987, IRS developed its current redesign plan, referred
to as its management plan. This plan provides the basic
approaches and preliminary design concepts IRS will use to redesign
its tax administration system by the late 1990s. The plan focuses
on designing more effective systems and seeks to establish a
continuing systems design and engineering process, taking advantage
of technological advances and giving the agency and taxpayers
timely, accurate information. The draft management plan was
reviewed by IRS' Assistant Commissioners, Regional Commissioners,
and Chief Counsel. IRS approved the plan in March 1988.

Overview of the Management Plan

Throughout the management plan, IRS provides the framework for
accomplishing the redesign. The plan describes the organizational
responsibilities to carry out the redesign. It also sets forth a
planning process that will incorporate specific technical and
managerial approaches. The plan provides for an incremental and
evolutionary process, which segments implementation of the redesign
into projects, each contributing to the overall architecture.[1]

An important part of implementing these projects is assigning
organizational responsibilities. According to IRS' management
plan, the Assistant Commissioner for Information Systems
Development will serve as the redesign manager and have the
critical role of integrating initiatives and building these
initiatives into a unified systems architecture. The plan states
that "the best integration of information systems development
efforts can be accomplished only through the Assistant Commissioner
[of Information Systems Development] working as a partner with all
other Assistant Commissioners." Further, IRS plans to use service
organizations, such as programming, procurement, and facilities, to
support the redesign. The Assistant Commissioners of functional
organizations, such as examination and collection, will manage
those individual redesign projects that directly support their
functional areas.

The plan describes the controls IRS will use to implement the
redesign, including written negotiated agreements with service
organizations and formulation of ADP policy by an Information
Systems Policy Board. The board is composed of agency executives,
including the Assistant Commissioner for Information Systems
Development, who serves as the focal point for introducing new

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[1]Architecture refers to the components of an automated information
system, including the hardware, software, and telecommunications.

technology and ensuring compatibility among existing and future projects.

In addition to assigning organizational responsibilities, IRS describes a planning process that provides a framework to guide and coordinate development and integration of individual projects. This includes setting priorities for projects, developing standards and procedures, and being responsive to user requirements.

IRS has divided planning into broad phases encompassing critical areas in the system development life cycle.[2] IRS intends this planning to be a flexible, iterative process that includes an analysis of user needs, a cost/benefit analysis, and detailed planning of individual projects from initiation through implementation. The agency will adjust the redesign's plans and development in response to feedback and changes in the IRS environment.

Planning will incorporate specific technical and managerial approaches. For example, IRS plans to

-- use contractors for system engineering and integration support;

-- take full advantage of state-of-the-art technologies;

-- use only proven technology and, when feasible, off-the-shelf solutions;

-- coordinate an acquisition strategy with GSA that will minimize procurement time, while making and evaluating prototypes of technologies to ensure feasibility before full-scale implementation; and

-- upgrade system hardware and software to ensure adequate computer capacity for processing future work loads.

IRS' preliminary design concepts and phases

IRS' management plan proposes a preliminary design concept for redesigning the tax administration system. This design concept consists of three different levels of automation: (1) a corporate data base that includes commonly used information for tax administration (i.e., name, address, and taxpayer account information); (2) departmental initiatives that provide employees specific information to support their functions, such as the

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[2]The system development life cycle is a series of phases progressing from concept initiation through design, development, installation, and maintenance.

automated collection system, a computer-driven telephone that helps
IRS employees contact taxpayers to handle delinquent accounts; and
(3) systems that provide automated support for specific local
office needs, such as documenting taxpayer lien information
specific to governmental jurisdictions. IRS plans to implement
these levels of automation incrementally during two system
enhancement phases--interim and target architectures--by 1998.

IRS formally approved the plan

The IRS Assistant Commissioners, Regional Commissioners, and its
Chief Counsel have reviewed the plan and the agency has
incorporated their comments. In March 1988, the Chairman (Deputy
Commissioner for Planning and Resources) of IRS' Information
Systems Policy Board approved the management plan. IRS intends the
plan to be a "living" document, and as such, the agency may make
changes to the document with the approval of the Information
Systems Policy Board.

Major Technical Enhancements -- Interim Architecture by 1994

- Modernize input processing and storage

- Develop departmental systems

- Convert data from sequential tape to direct access media for a query data base environment

- Develop local area networks

MAJOR TECHNICAL ENHANCEMENTS--
INTERIM ARCHITECTURE BY 1994

IRS' proposed interim architecture will modernize operations at the service centers, district offices,[3] and National Computer Center. According to IRS' information system officials, Tax System Redesign will modernize the way IRS processes its information from its current, labor-intensive system to a more effective interim architecture by 1994 (see figures II.1 and II.2). IRS' incremental approach seeks to (1) reduce the paper-based manual processes by modernizing input processes and storage capabilities, (2) develop departmental systems for more efficient, timely processing, (3) convert data from sequential magnetic tape to direct access media, and (4) develop local area networks,[4] enabling IRS personnel to quickly obtain taxpayer information. In addition, during the interim architecture, IRS is planning procurements to support the technical enhancements and to provide adequate capacity for future work loads. IRS has not developed cost estimates for the interim architecture's technical enhancements. It plans to develop detailed costs and benefits during the next 2 years (see app. V).

Modernize input processing and storage

IRS is pursuing several initiatives to modernize input processing and storage capabilities. Specifically, IRS plans to make better use of technologies currently available in the marketplace to speed up return processing. IRS intends to expand the use of (1) electronically filed tax information, rather than paper returns; (2) optical scanning devices to read and capture tax data; and (3) optical disks[5] to store and process information. IRS plans to test and evaluate these technologies during the interim architecture.

Develop departmental systems

Another major objective of the interim architecture is to develop departmental systems. Major functional organizations within IRS are developing automated systems to support their unique

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[3]IRS' ten service centers process tax returns and correspond with taxpayers. Its 63 district offices handle taxpayer inquiries and ensure compliance with tax laws.

[4]A local area network is a telecommunications network that serves a small geographical area. Local area networks typically interconnect computers, terminals, and peripheral equipment.

[5]Optical disks are large capacity devices on which digital information is "burned" using lasers (light amplification by stimulated emission of radiation).

information needs. Currently, the only departmental system fully
operational is the automated collection system, which provides
information on delinquent taxpayer accounts. IRS' planned
departmental systems (see fig. II.2) include the following:

-- Integrated collection system. This system is intended to
   further automate data on delinquent taxpayer accounts and allow
   information to be shared between collection personnel. This
   information would include taxpayer assets, liens, and levies.

-- Automated examination system. This system is intended to
   provide further support to the examination function, which
   audits tax returns, with automated capabilities including tax
   adjustment calculation and audit report generation.

-- Automated criminal investigation system. This system is
   intended to give criminal investigators information and
   capabilities to analyze cases, including statistics and legal
   issues on cases being reviewed.

-- Automated taxpayer service system. IRS is acquiring desk-top
   microcomputers for taxpayer service employees, who educate the
   public on tax reporting responsibilities. Microcomputers will
   provide better access to information that will help resolve
   taxpayers' inquiries. For example, it will automate taxpayer
   orders of forms and publications.

-- CITATOR reference information system. This system is intended
   to consolidate research information, including the IRS tax code,
   guidelines, and manuals required by the different functions
   (i.e., examination and taxpayer service).[6] CITATOR will provide
   research information electronically to any IRS office.

Each of these departmental systems is intended to exchange
taxpayer information with IRS' primary tax processing system at the
National Computer Center. For example, the automated collection
system should provide information on delinquent taxpayer accounts
to a collection employee. After the employee handles the case, the
National Computer Center's master file will be updated.

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[6]Although the CITATOR reference information system will provide
data for several IRS functions, the organization responsible for
examinations is currently managing the project and as such, IRS has
identified it as a departmental system during the interim
architecture.

Convert master files to direct access media

Modernizing the National Computer Center's master file is a key initiative during the interim architecture phase. Currently, the master file is difficult to access because it is kept on magnetic tape and updated sequentially. Further, IRS has to send tapes by airplane between its ten service centers and the National Computer Center (see figs. II.1 and II.2). Depending on the detail of information requested, it may take up to 3 weeks for IRS personnel to retrieve this information. Because of this inherent delay, IRS maintains a limited portion (about 20 percent) of the National Computer Center's master file on-line[7] at the service centers. This system—the integrated data retrieval system—provides limited information to authorized IRS employees and duplicates some of the current data on the master file. Consequently, IRS plans to convert selected files of data from tape to a direct access media, such as magnetic disk, giving authorized employees on-line query ability to the master file.[8] This will help answer taxpayers' inquiries by providing a wider range of taxpayer data to IRS personnel quickly (within minutes or overnight).

Local area networks and procurements planned

IRS also plans to provide better information between service center activities by developing local area networks within each service center. These networks will provide access to taxpayer information needed for functional organizations, such as collection and taxpayer service.

To provide mainframe and peripheral support for these and other technical enhancements, IRS is planning several procurements. Specifically, IRS intends to procure a service center support system for the Tax System Redesign technical enhancements. IRS also plans to shift some of the work load currently being processed

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[7]Refers to a user's ability to access and interact with a computer through a terminal.

[8]The information in these files will be available through any terminal in the communication replacement system. For detailed information on this system, see Data Communications: Delays Hampering Installation of IRS' Communications Replacement System, (GAO/IMTEC-88-1, Oct. 8, 1987).

on service center mainframes to the service center support system
to ensure adequate capacity through the mid-1990s.[9]

To achieve the proposed interim architecture, IRS plans to make
changes to software, hardware, storage devices, and
communications. To ensure continuity of processing, IRS plans to
use the on-line query data file and, at the same time, continue to
update taxpayer accounts through its current tape sequential
process until a data base environment is established in the target
architecture.

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[9]For additional information on computer capacity issues, see
statement of James R. Watts, Associate Director, to the
Subcommittee on Oversight, House Committee on Ways and Means
(GAO/T-IMTEC-88-1, Feb. 23, 1988).

Major Technical Enhancements -- Target Architecture by 1998

●   Continue to modernize input processing

●   Develop a corporate data base in an on-line, real-time environment

●   Install a nationwide telecommunications network

MAJOR TECHNICAL ENHANCEMENTS--
TARGET ARCHITECTURE BY 1998

During the second phase of the redesign--target architecture--IRS plans to continue modernizing input processing methods, minimizing paper-based manual returns and providing more complete taxpayer information to agency employees. Further, the target architecture will provide information to employees through an interactive environment, where information is available on data bases and accessible through a nationwide telecommunications network by 1998. This will eliminate flying tapes to and from the National Computer Center. In addition, because information will be readily available and automatically posted to the master file,[10] it will also eliminate the need to maintain the limited information currently available on the integrated data retrieval system (see fig. II.3). IRS has not developed cost estimates for the target architecture's technical enhancements. The agency plans to develop detailed costs and benefits during the next 2 years (see app. V).

Through a continuing effort to modernize input processing, IRS plans to minimize the handling of paper-filed returns. It also plans to test and expand its electronic filing system and continue to standardize tax return data, fostering the use of optical scanning and image technology. This will provide more complete taxpayer information. Currently, only summaries of taxpayer data are maintained on the master file's magnetic tapes at the National Computer Center. To analyze the return or provide answers to taxpayer inquiries, employees must retrieve the taxpayer's paper document for complete information. Instead of this, by scanning and imaging the complete tax return, comprehensive information will be readily available. For example, in resolving a taxpayer inquiry or auditing a taxpayer return, an authorized employee will be able to electronically retrieve an image of the filed tax return for reference.

Another key technical enhancement in the target architecture will be the development of corporate data bases in an on-line, real-time[11] environment. This type of environment will not only allow information on a query basis, as in the interim architecture, but

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[10]IRS has not performed the analyses required to determine what information will be automatically updated and the extent of real-time processing capability that will be provided. These analyses will be developed during the interim phase.

[11]IRS will select specific information that will be processed by a computer at the same time information is being input. Other information will be batched and transmitted overnight for processing.

will also allow authorized employees to update taxpayer accounts
within minutes or overnight. The corporate data base would consist
of five components: a tax information data base, a document image
data base, a reference data base, an information documents data
base, and a management information systems data base. These data
bases will modernize the storage and retrieval of a wide range of
information. For example, taxpayers' income deductions and payment
amounts, as well as interest and dividends reported by banks will
be maintained.

To support the proposed corporate data bases and the on-line,
real-time updating processes, IRS plans to develop new computer
software to replace its multi-million lines of assembler language
code, which are currently used to maintain and process tax
information at the National Computer Center. In addition, IRS'
preliminary design calls for establishing a back-up facility to
provide continuity of operations in case the tax administration
processes are disrupted (see fig. II.3).

Also within the target architecture, IRS plans to implement a
nationwide telecommunications network. This nationwide network--
combined with the new software, corporate data bases, and local
area networks--will ultimately allow direct updates and adjustments
to taxpayer accounts. IRS' management plan states that this will
greatly enhance the tax administration system's service to
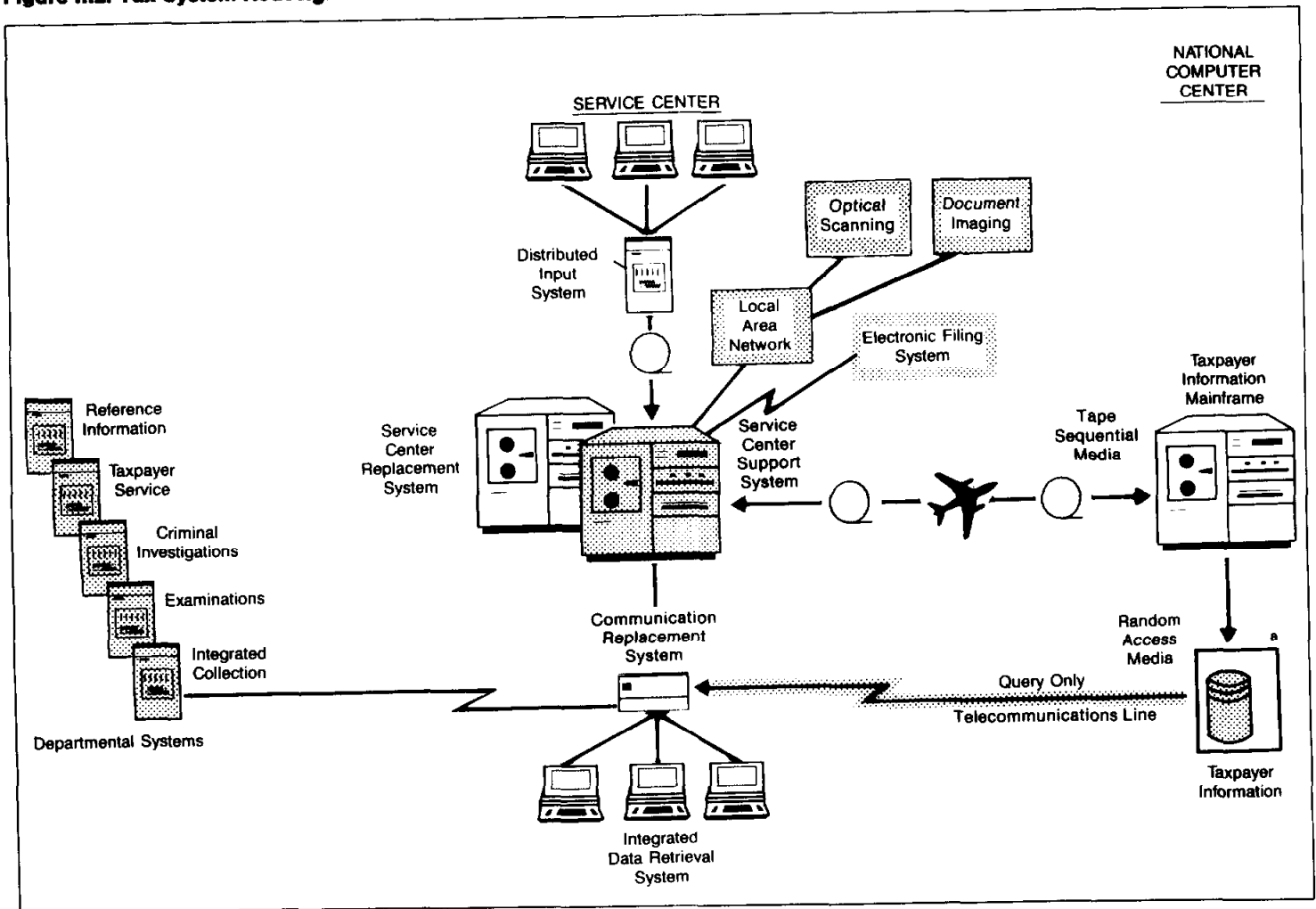employees and taxpayers.

**Figure II.1: Tax System Redesign—
Current Architecture**
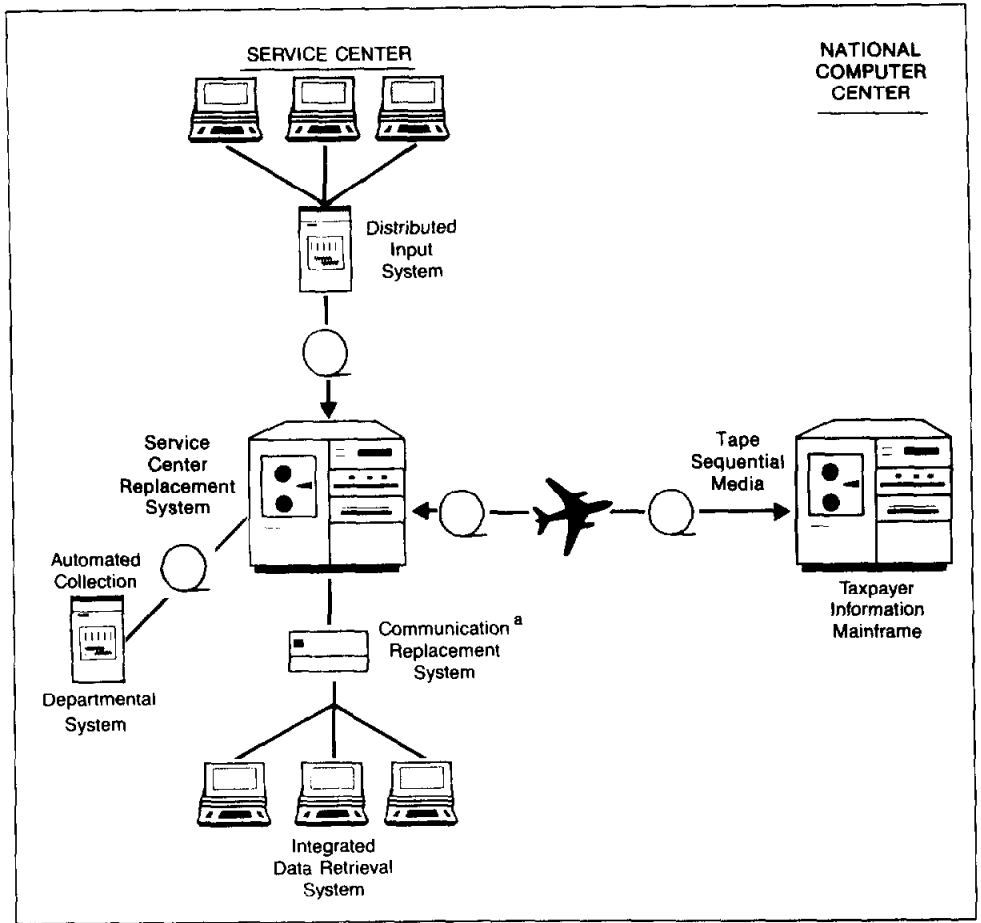
Note: Currently, district offices obtain and process information from the Integrated Data Retrieval System.

[a] Currently, IRS is installing a communication replacement system in its service centers.
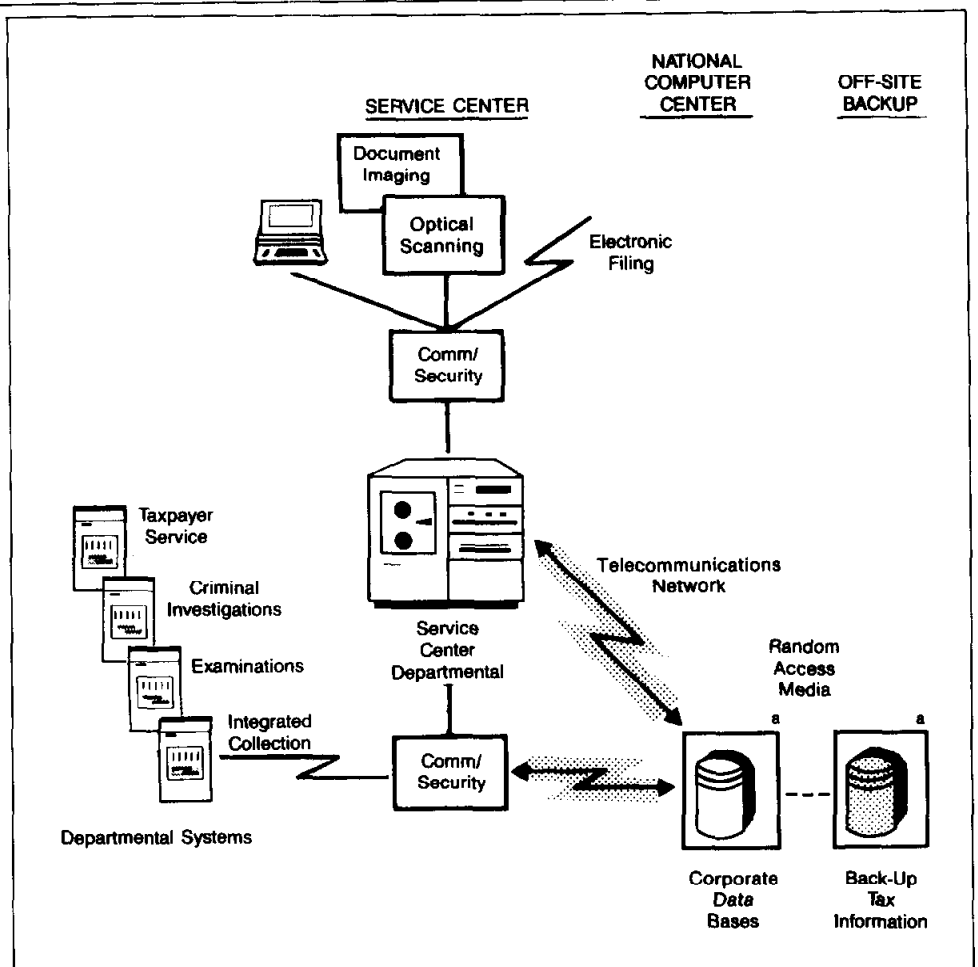
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Figure II.2: Tax System Redesign—Interim Architecture

Note: IRS plans to implement departmental and other systems in its district offices. The agency is developing district office architectures and plans to publish these charts in a few months.

[a] The hardware component(s) will be determined after IRS completes system analyses.

Figure II.3: Tax System Redesign—Target Architecture

	NATIONAL COMPUTER CENTER	OFF-SITE BACKUP
SERVICE CENTER		

Document Imaging

Optical Scanning

Electronic Filing

Comm/ Security

Taxpayer Service

Criminal Investigations

Examinations

Integrated Collection

Departmental Systems

Service Center Departmental

Comm/ Security

Telecommunications Network

Random Access Media

Corporate Data Bases

Back-Up Tax Information

[a]The hardware component(s) will be determined after IRS completes system analyses.

Tax System Redesign Progress

- Established management framework

  -- Redesign official's role defined

  -- Offices formed to manage the redesign

- Initiated contractor and other outside technical assistance in

  -- Design concept and system engineering

  -- Data planning and system documentation

  -- Current and advancing technologies assessment

- Initiated technical enhancements for the interim and target architectures

  -- Modified or developed standards for key aspects of system life cycle activities

  -- Acquired automated project management tool

  -- Initiated plans for cost/benefit analysis, security measures, and acquisitions

  -- Assessed available technology

  -- Made and tested prototypes of systems

TAX SYSTEM REDESIGN PROGRESS

Since spring 1987, IRS has continued to make progress in launching its fourth and latest redesign approach. The agency has put in place a management framework to oversee the program, and developed a management plan and controls to implement the program. IRS also obtained contractor and other outside technical assistance to develop redesign concepts and plans. In addition, IRS initiated or continued to implement technical enhancements for the interim and target architectures.

Management framework established for the redesign

While developing the management plan, IRS established the organizational structure and assigned responsibilities to carry out the redesign. IRS' Internal Revenue Manual, updated in August 1987, specifies the expanded role of the Assistant Commissioner for Information Systems Development to include managing and integrating tax information initiatives and serving as the information systems manager for IRS' tax processing system.[1] Also, during the summer of 1987, the Information Systems Development Office began a reorganization resulting in six offices to carry out the redesign. The offices, all of which currently have an appointed director and assistant director, will plan, monitor, and evaluate systems development. The offices' responsibilities include developing standards, coordinating input processing initiatives, and integrating interdependent redesign projects.

With the establishment of these offices, IRS proceeded to hire staff from inside and outside the agency. Currently, the Information Systems Development Office has 200 staff members--70 percent of the 286 authorized positions.

Outside assistance being used

IRS is using its own resources to accomplish the redesign, complemented by contractor and other expert support. Within the last year, IRS contracted with several firms for technical support. Through a contract with the GSA, MITRE Corporation has played a significant support role, providing general systems engineering in the early phases of the redesign. MITRE helped IRS lay out a planning model and is assessing IRS activities carried out within

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[1]As part of a general management review, GAO is assessing IRS' organizational responsibilities for managing its information resources.

this model. MITRE has also supported IRS in developing the interim
and target architectures, and helped redesign managers coordinate
14 different input processing initiatives into a smaller number of
integrated projects. MITRE has further assisted in systems
engineering by defining a structure to collect data and integrate
the core requirements of the redesign. This data will be used for
options analyses, trade-off studies, and acquisition strategies.

IRS has also contracted with James Martin and Associates for data
planning support. With the contractor's assistance, IRS is
conducting an organizational analysis of the data needed to perform
its mission. IRS also obtained a multi-year contract with
Aquidneck Data Corporation to document the current tax processing
system using an automated tool. In addition to using contractual
support, IRS has requested assistance from other organizations with
expertise in redesign related issues. IRS has arranged with the
National Bureau of Standards to use its services to develop
prototypes,[2] review standards, and assess optical character
recognition technology.

Progress towards the interim
and target architecture

IRS has begun work towards the interim and target architectures.
Specifically, the agency is developing management controls that
will help guide and coordinate the redesign. IRS has also begun to
perform cost/benefit analyses, address security issues, and develop
an acquisition strategy. Further, IRS has performed analyses,
systems tests, and related studies to understand and implement
technical enhancements.

IRS is developing standards and project milestones to help manage
and control the redesign. A standards office within the
Information Systems Development Office was established in 1987 to
help the agency move towards developing IRS-wide systems standards.
According to the Director of the Standards and Data Administration
Office, it has developed new, or modified existing, standards
relating to data bases and documentation, and is developing
standards for security and communications. In addition, it has
begun training staff in systems development life cycle methodology.

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[2]A prototype is a model of a system that may eventually be
developed. A prototype provides early user involvement in the
design process and the opportunity to delineate requirements and
evaluate critical system characteristics.

The standards office has also formulated requirements for data base management systems.

IRS has developed general program schedules for the input processing area, departmental systems, data bases, and the national telecommunications system (see fig. III.1). Further, project managers have been trained to use a newly acquired project management software package. The software package is a project tool that will enable managers to review interdependent projects and monitor work schedules.

IRS plans to use models to analyze the costs and benefits of the target design. It has formulated an action plan for developing these analyses, and plans to provide detailed costs of the current system by October 1988. These costs will be used as a basis for comparing the costs of alternative designs. In addition, because security administration is expected to affect the redesign, the agency has begun to address this critical area. It has hired staff within the redesign office to address potential issues and has started plans to identify and test available security measures.

IRS is also working on an acquisition strategy for the redesign. The strategy describes the framework IRS intends to follow in buying hardware, software, and contractor support. A part of IRS' acquisition strategy is to obtain participation from staff having contract, legal, technical, and user expertise. To date, IRS has begun work on acquisitions for input processing, departmental systems, and placing files on-line.

IRS has also performed studies and tests supporting the interim and target architecture. Among the analyses IRS conducted are:

-- Pilot tests of electronic filing--approximately 26,000 and 78,000 returns electronically filed in 1986 and 1987, respectively.

-- A demonstration during the summer of 1987, with the assistance of a research group in Cambridge, Massachusetts, that the automated collection system could be connected with the integrated data retrieval system. This demonstrated that a departmental system could successfully access an on-line data base obtaining up-to-date information.

-- A test of small data base machines to determine performance characteristics, such as response time and the quality of vendor support.

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-- A test of optical disk technology to assess its use in the IRS environment.

-- A statement of work for a contractor to study the planned nationwide telecommunications system and local area networks. The study, which IRS expects to be completed by September 1988, will identify IRS' telecommunications requirements.

-- Plans to test and develop prototypes for several departmental and other redesign systems. For example, IRS is testing a management information system at the Philadelphia, Pennsylvania service center. The first phase of this system will automate employee evaluations and performance measures.

Figure III.1: Timeline for Major Technical Enhancements—As of January 1988
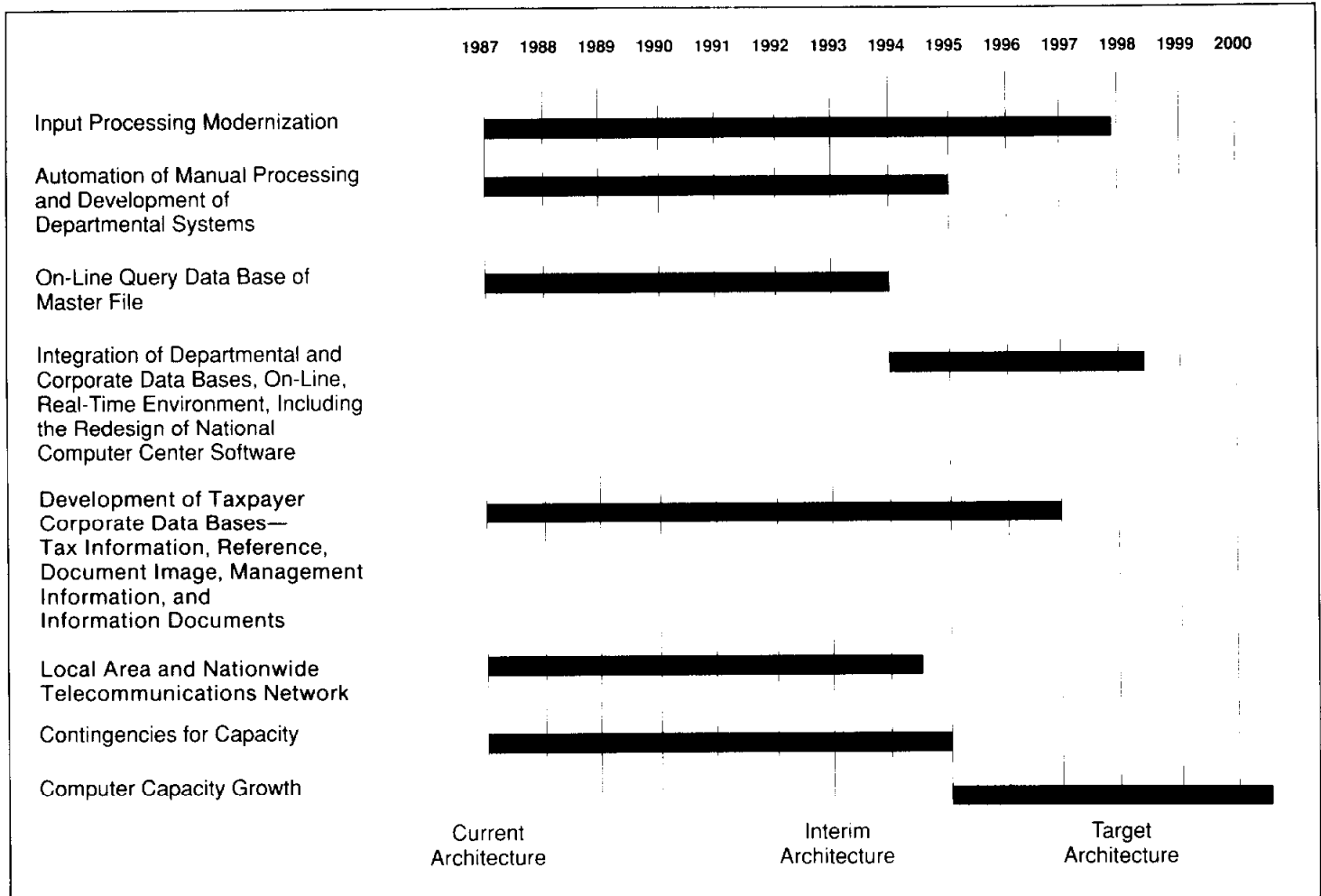
Note: These dates may change as new technologies become available and as IRS proceeds with and adjusts the plan.

Oversight Agencies' Comments and Concerns

- Treasury is providing extensive oversight of the redesign

  -- Approves general direction of the redesign plan

  -- Plans to review specific redesign information during the next year:

     Requirements analyses
     Program milestones, costs, and benefits

- GSA is currently assessing the redesign

  -- Supportive of plan as an overall framework

  -- Plans to discuss acquisition approach with IRS

- OMB continues to review and assess the redesign

  -- Encouraged by plans and progress

  -- Believes IRS responded to past concerns, including planning input from tax preparers

  -- Believes IRS is addressing outstanding concerns:

     Complexity and control
     Supporting analyses

OVERSIGHT AGENCIES' COMMENTS AND CONCERNS

Several oversight agencies--Treasury, GSA, and OMB--are reviewing
the redesign and are supportive of the program's plans and
progress. As redesign has progressed, these agencies have raised
concerns that IRS continues to address. Some oversight concerns
include the size and complexity of the redesign, the acquisition
approach, and the analyses required for cost/benefit and
alternative options.

Treasury overseeing redesign

Since the redesign's inception in 1982, the Department of Treasury
has played a significant role in overseeing the redesign plans and
progress. Over the years, IRS has sought Treasury's approval for
the overall redesign approach and its proposed procurement process.
Through its oversight role, Treasury has helped shape the current
redesign approach and approves of IRS' current direction. Treasury
plans continued involvement in the redesign program to help IRS
successfully implement the current approach.

During the next year, Treasury will be seeking more specific
information regarding the redesign program. For example, Treasury
anticipates that IRS will develop a requirements analysis package
to be used for major procurements. This document will be used to
seek a delegation of procurement authority from GSA. Treasury
would also like IRS to provide more specific information on the
redesign program's costs and milestones, and how the projects
support the management plan. This will enable Treasury to track
and assess IRS' progress in weekly oversight meetings.

GSA assessing redesign plans

GSA is reviewing the Tax System Redesign management plan as part of
its role in overseeing the federal government's investment in
information resources and in delegating procurement authority.
GSA officials support the plan as an overall framework and believe
it is a good beginning, providing IRS managers with general
redesign guidance. According to GSA officials, the plan describes
a large and technically complex program, and overall, covers major
aspects of a system redesign. GSA would, however, like to obtain a
clearer understanding of IRS' acquisition approach. GSA wants to
ensure that acquisitions are performed in a timely, effective
manner and provide state-of-the-art technology. GSA and IRS plan
to discuss these issues.

Major acquisitions are extremely important to the success of a
redesign program. The acquisition process is complex and time-
consuming, including reviews of user needs, alternative analyses,
technical requirements, and solicitation, evaluation, and award of
contracts. Acquisition reviews are usually performed sequentially
within the agency, the department, and GSA. According to a GSA
report, this requires an average of 38 months to complete,[1]
primarily because of the procurement complexities and the
sequential review and approval process. In order to speed up the
process, IRS' management plan calls for an acquisition approach
involving parallel procurement reviews. GSA is particularly
interested in this area because it is encouraging agencies to use
innovative approaches to speed up the acquisition process.

Basically, GSA wants to ensure that IRS understands and has the
necessary commitment of upper management to successfully implement
a program with parallel reviews. Key individuals must be involved
throughout the process to provide continuity for the procurement.

Another general concern of GSA is that government agencies do not
continue to buy and keep outdated equipment. This concern stems
from the findings of the President's Private Sector Survey on Cost
Control, dated January 16, 1984. This survey found that
government agencies tend to keep outdated automated data processing
equipment. In this context, GSA plans to discuss with IRS both its
long-term (12 year) acquisition time frame and the risks and
problems of buying equipment too quickly.

GSA and IRS plan to discuss these issues in detail. IRS'
information system development staff attended, in March 1988, a GSA
training course on the new acquisitions concepts. Further, IRS
plans to brief GSA on its acquisition approach.

OMB continues to review and assess redesign efforts

OMB has identified the redesign as one of the Presidential
Priority Systems. These are systems that warrant "continuing top
management priority" because of their size, complexity,
sensitivity, or precedent-setting technology. Under the
Presidential Priority Review System, top OMB and IRS officials meet
quarterly to discuss factors critical to the redesign's success.
Accordingly, OMB reviews IRS' progress in establishing program
scope and milestones, defining user needs, and analyzing costs and

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[1]"Go For 12" Program: An Interim Report on the Elimination of
Unnecessary Bottlenecks in the Acquisition Process, GSA,
Information Resources Management Service, March 1987.

benefits. OMB was initially critical of IRS' early attempts at redesign, but was encouraged when IRS decided in 1986 to use in-house expertise, rather than relying solely on the private sector, to define the redesign's goals, objectives, and requirements. In addition, these oversight officials believe IRS is quickly responding to their concerns. OMB has offered several suggestions that IRS has adopted for improving the management plan. For example, at OMB's suggestion, IRS has developed a planned approach to obtain input on the redesign from key segments of the customer population, including professionals who prepare tax returns, individual taxpayers, vendors, and other tax administration agencies.

OMB continues to review and express concerns about the redesign. Oversight officials view the redesign as an extremely large and complex program, one that will be difficult to control and integrate because it comprises many projects throughout the agency. While OMB believes IRS' effort in establishing and updating redesign milestones was a step in the right direction, it believes more work is needed to identify relationships among the numerous projects and to designate the critical paths IRS will follow during redesign.

Further, the oversight agency would like IRS to complete alternative analyses to provide direction for the redesign. OMB asked IRS to identify and analyze two or three alternative designs. Based on these analyses, the oversight agency would like IRS to make critical redesign decisions that should help define the system's physical design. According to OMB management analysts, this includes determining the number of processing sites and what specific information will reside in the three levels of automation (i.e., corporate data base, departmental systems, and user specific systems). Oversight officials believe these decisions, supported by analyses, would help provide program continuity, regardless of changes in agency leadership.

IRS plans to meet with OMB in spring 1988 to update redesign plans and progress.

Future Redesign Plans

● Select and refine a system design

● Make critical redesign analyses and decisions

FUTURE REDESIGN PLANS

IRS' management plan and redesign projects have established a
foundation and framework for developing an integrated tax
administration system. In the next several years, IRS plans to
perform detailed analyses to support the selection of a system
architecture. These analyses will evaluate alternative designs,
costs, and benefits. In addition, IRS plans to determine its user
and capacity needs. This work is intended to support an
acquisition strategy and delegations of procurement authority.
Also, IRS plans to install an automated tracking system that will
help integrate redesign projects. Anticipated milestones of these
projects are shown in the list on page 40.

While these projects are pursued and IRS proceeds with the
selected design, IRS plans to address critical questions, such as

-- What specific information should be available for on-line query
   and updating purposes?

-- What specific system architecture should effectively and
   efficiently provide IRS with its existing and future capacity
   needs?

-- What type of telecommunications network should be used to
   connect service centers and processing sites?

Major Tax System Redesign Milestones
for 1988 and 1989

March 1988	Present the acquisition strategy to GSA for comment
May 1988	Install redesign work schedules on automated tracking system
June 1988	Submit to Treasury a requirements analysis package for systems engineering and integration support
July 1988	Receive a delegation of procurement authority for service center support system
August 1988	Complete definition of global baseline user requirements
September 1988	Receive a delegation of procurement authority for upgrading the National Computer Center's file to direct access media
October 1988	Provide complete cost of the current system
December 1988	Identify candidate architectural options and establish a methodology to analyze options
June 1989	Select two or three architectural options for detailed cost/benefit analyses
October 1989	Select the redesign system architecture
December 1989	Complete project plan for departmental systems and corporate systems integration

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