

GAO

Report to the Chairman, Subcommittee on  
Oversight, Committee on Ways and  
Means, House of Representatives

May 1989

# ADP MODERNIZATION

## IRS Needs to Assess Design Alternatives for Its Electronic Filing System



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United States  
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Information Management and  
Technology Division

B-227683

May 5, 1989

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

Dear Mr. Chairman:

As agreed with your office, this report provides the results of our review of the Internal Revenue Service's (IRS) electronic filing system. Electronic filing has the potential to streamline the tax processing system by allowing individual tax returns to be filed using computers instead of traditional paper forms. In a prior report, we summarized IRS' early efforts to develop an electronic filing system.<sup>1</sup> The objectives of our current review were to report on the problems this system encountered during the 1988 and 1989 filing seasons and IRS' approach for expanding electronic filing nationwide in 1990.

IRS has spent about \$13 million through fiscal year 1988 developing an electronic filing system. Although this system processed about 583,000 returns during the 1988 filing season, it experienced problems when a major software component was unable to operate as intended. IRS also experienced contracting problems that resulted in payment for defective software. In December 1988, IRS' electronic filing project office drafted a proposal for enhancing the current system to achieve the agency's 1990 goal of expanding the availability of electronic filing nationwide. The project office estimated that about \$37 million would be required to expand, modify, and maintain this system so that it can handle the projected nationwide volume of about 36 million electronic returns by 1997.

We are concerned about this approach to expand electronic filing because (1) the system was originally developed solely as an interim measure until a nationwide system could be fielded, and (2) IRS has not demonstrated that this approach is the best for achieving the agency's ultimate goals for electronic filing. Before making a major financial commitment to expand the current system, we believe that IRS should clearly define its nationwide needs, analyze alternative approaches for meeting those needs, and resolve its software development problems.

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<sup>1</sup>ADP Modernization: IRS' Progress on the Electronic Filing System (GAO/IMTEC-88-40, July 13, 1988).

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## Background

IRS developed a pilot system in 1986 to test the technical feasibility and public acceptance of electronic filing in a small geographical area. On the basis of preliminary test results, IRS began developing a system in 1986 to meet its long-range needs for nationwide electronic filing. IRS expected to field the new system in 1988. A key part of its strategy was to buy mainframe computers to process the electronic returns.

IRS abandoned its development approach for the nationwide system when the Department of the Treasury rejected IRS' plan for purchasing the mainframes in November 1986. According to Treasury and IRS officials, Treasury disapproved IRS's plan to use an existing contract to buy computers because (1) the contract was in danger of going into default, and (2) buying computers for electronic filing was beyond the contract's scope. IRS estimated it would take until 1990 to compete a new contract and begin fielding a nationwide system. Rather than delay expanding the availability of electronic filing until then, IRS chose to develop an interim system at its Cincinnati, Ohio, and Ogden, Utah, service centers for use during the 1988 and 1989 seasons.<sup>2</sup>

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## IRS' Interim System Experienced Problems During the 1988 and 1989 Filing Seasons

According to the Assistant Commissioner for Information Systems Development, IRS decided to develop an interim system because it wished to promptly obtain the benefits of electronic filing by making it available in more districts. The pilot system used in 1986 and 1987 could not be used for this purpose because it could not handle the increased work load that expansion would entail. IRS proceeded with this strategy even though its prime contractor believed the interim system might well fail during 1988 because there was not enough time to adequately design and test it. IRS also knew that it would have to replace the software used for storing and retrieving returns because it was not designed to handle the projected 36 million tax returns expected when electronic filing is expanded nationwide. This software cost about \$1.7 million.

In 1988, the agency expanded electronic filing from the seven metropolitan areas covered by the pilot system to 16 IRS districts, including many major metropolitan areas. During the 1988 filing season, the interim system processed about 583,000 returns. The agency believes it has provided faster refunds to taxpayers by eliminating manual preparation

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<sup>2</sup>To file electronic returns using the interim system, taxpayers typically must pay professional tax preparers or others authorized by IRS to transmit the returns. A computer, electronic communications equipment, and related software are required. IRS authorizes only those transmitters who apply and successfully complete IRS tests designed to verify competence in transmitting returns. Tax preparers may also transmit through an authorized intermediary firm which transmits directly to IRS.

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and key-entry of data from paper tax returns into IRS' computers. IRS information indicates that electronically filed returns were processed in 1988 with significantly fewer errors than paper returns; as of April 1988, about 5.5 percent of electronically filed returns had errors vs. 20 percent of paper returns. This should save IRS the additional cost of identifying and correcting errors and help taxpayers get correct refunds. However, we are not aware of any published analyses of the costs and benefits of this system.

Although IRS was able to process the returns received electronically in 1988, software for a major system component did not work as intended. The prime contractor responsible for developing the software for storing and retrieving electronic returns could not deliver this software until December 1987, 3 months behind schedule and just 1 month before the 1988 filing season. According to the Chief of IRS' Compliance Systems Testing Branch, this prevented IRS from thoroughly testing the software to ensure that it worked properly before using it. In pursuing an overly optimistic schedule for system development, IRS was driven by project milestones geared to implementing a system in time for the 1988 filing season. According to the Assistant Commissioner for Information Systems Development, IRS accepted the risks of this development approach in order to achieve the expected benefits of the system as soon as possible.

Ultimately, the software never worked correctly. Specifically, an electronic replica or image of the returns could not be stored and retrieved as fast and reliably as needed for processing. As a result, stop-gap manual operations were necessary to correct errors. IRS tax examiners had to print paper copies of returns, annotate their corrections, and store these paper records. IRS decided to replace the defective software prior to the 1989 season and reprocess the returns filed during 1988 using the new software so they could be properly stored and retrieved.

The system experienced similar problems in 1989 because the replacement software was not ready on time. As a result, IRS again had to print paper copies of thousands of electronic returns that contained errors in order to correct them and issue refunds. IRS decided to install portions of the incomplete software in mid-February, to avoid printing more of these returns. According to IRS officials, the replacement software will not be completely installed or fully tested until about mid-April, the end of the 1989 filing season. The replacement software is expected to cost about \$2 million.

## Contract Terms for Performance Requirements and Test Periods Were Inadequate

According to electronic filing project office officials, IRS' failure to clearly define system performance requirements or allow enough time to decide whether the deliverables were acceptable contributed to the problems with the defective software in 1988. IRS developed this software by engaging Vanguard Technologies, Incorporated, under a previously awarded support services contract that required the agency to obtain from Vanguard certain automated data processing services, such as the design and installation of software for major projects. IRS issued a task order under this contract containing 80 contract deliverables for a multi-phased design and development effort. Portions of the work under this task order were subcontracted, including the development of the 1988 software discussed above.

In failing to clearly define critical performance requirements for the software in task order documents, IRS did not, for example, specify the volume of returns the software should be able to handle during peak processing periods or the response times acceptable during these periods. According to the project office, the software had to be replaced because it could not meet the response times that would be required for 1989 and beyond.

The Chief of IRS' Capacity Management Branch—which is responsible for providing technical assistance to other IRS offices—stated that his staff could have helped the project office write adequate contract performance requirements. The project office did not take advantage of this opportunity for assistance, in part because IRS procedures do not require project offices to seek technical assistance from the Capacity Management Branch. The project office has been working with the Capacity Management Branch in developing recent contracts for the 1989 filing season. As a result, the contract documents for the 1989 system more explicitly state performance requirements. For example, the contractor is required to develop software that will store 750,000 electronic returns per week. The Branch Chief stated that IRS procedures should be clarified to help ensure that IRS project offices obtain the necessary technical assistance from the Capacity Management Branch in developing systems.

When defining the acceptance period for software to be delivered under the task order for the 1988 system, IRS did not allow enough time for quality assurance testing. The task order issued to Vanguard allowed IRS only 10 days to evaluate each deliverable. According to the IRS testing plan, however, quality assurance testing for the software designed to store and retrieve electronic returns required about 3 months.

IRS paid Vanguard about \$186,000 for subcontractor-developed software that failed to work properly. Of this amount, IRS authorized that Vanguard be paid \$124,606 for the installation of software at IRS' Cincinnati Service Center before testing was completed. IRS authorized payment for the software on January 20, 1988. The Compliance Systems Testing Branch began software testing during the week of January 17, 1988, and terminated testing on April 22, 1988, about 3 months later. According to the final testing report, the software should not have been accepted because of numerous unresolved problems. In addition, IRS took about 4 months to reject the software at the Ogden Service Center because it did not work as intended. Nevertheless, IRS eventually paid Vanguard \$61,315 for the installation of the Ogden software. According to a project official, IRS could not require Vanguard to revise the software because the contract terms had not provided adequate performance criteria to clearly establish the contractor's accountability for these revisions.

For 1989, in an attempt to allow more time for testing task order deliverables while also meeting project milestones, the project office increased the acceptance period to 20 days. According to the Chief of the Compliance Systems Testing Branch, however, 20 days still does not allow sufficient time to perform software quality assurance testing.

## IRS Faces a Critical Decision Regarding the Future of Electronic Filing

By 1997, the agency projects that over 36 million of an anticipated total of 123 million returns will be filed electronically. After the 1988 filing season, the electronic filing project office abandoned its earlier plans to replace what began as a 2-year interim system with a new nationwide system in 1990. Instead, in December 1988, the project office proposed enhancing the current system to achieve its 1990 goal of expanding the availability of electronic filing nationwide. In February 1989, the project office estimated that about \$37 million would be required to expand, modify, and maintain the current system and about \$139 million more would be necessary to operate it from fiscal years 1989 through 1999. Through fiscal year 1988, IRS had already spent about \$13 million in developing, prototyping, and operating an electronic filing system.

IRS has yet to clearly identify its needs and evaluate the costs, benefits, and technical feasibility of alternative approaches, as required by federal regulations. Performing this analysis would help IRS determine the best approach. Specifically, IRS has yet to:

- assess whether the current system will meet IRS' nationwide needs, since it was developed as an interim system. IRS has not performed an analysis of these needs;
- decide how to minimize the burgeoning, paper-intensive aspects of the current system. With each electronic return, the tax preparer must submit a signature form and W-2. Responsible IRS officials said that during the 1989 filing season, IRS employed 47 people to receive, review, and file these forms, not including data entry staff who transcribe this information into the computer. IRS is considering the legal implications of eliminating the requirement for original signatures and W-2s. Depending on how this issue is resolved, IRS may eventually modify the system so that signatures and W-2s can be transmitted electronically. This could significantly affect system design and costs; and
- decide how the current system will accommodate the processing of tax due returns (presently planned for 1990). Since the current system now handles only refund returns, it will have to be modified to handle tax payments through electronic transfers, credit cards, or other means.

Treasury officials share our position that IRS needs to define requirements and assess alternatives. In January 1989, Treasury directed IRS to perform the analysis necessary to identify the best approach.

## Conclusions

IRS plans to expand electronic filing nationwide in 1990 based on its potential benefits in reducing the costs and errors in processing returns and providing faster refunds to taxpayers. However, the agency will not know whether the current system being proposed by the electronic filing project office is the best approach for accommodating expansion until it clearly defines system requirements and evaluates the costs, benefits, and technical feasibility of other approaches.

In attempting to field the interim system, IRS experienced software development problems with a major system component. IRS also experienced contracting problems that resulted in payment for software that did not work as intended. Specifically, IRS did not (1) clearly define product performance requirements in contract documents, or (2) allow enough time for thorough product testing.

## Recommendations

We recommend that the Commissioner of Internal Revenue validate the design approach for the nationwide electronic filing system before selecting and funding a system. At a minimum, IRS should:

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- clearly define system requirements for nationwide implementation. For example, IRS needs to determine how it will (1) minimize the burgeoning, paper-intensive nature of the current system, and (2) accommodate the processing of tax due returns; and
  - identify and analyze the costs and benefits of various alternatives for meeting the requirements for a nationwide system.

We also recommend that the Commissioner ensure better management in contracting for automated data processing support services by:

- revising IRS procedures to require project offices to get technical assistance in writing and negotiating contracts for major automated data processing systems; and
- allowing enough time to thoroughly test deliverables, thereby ensuring product quality.

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## Objectives, Scope, and Methodology

The objectives of our work were to assess the problems encountered during the 1988 and 1989 filing seasons and IRS' approach for developing a nationwide electronic filing system. We conducted audit work between July 1988 and March 1989 at the Office of the Assistant Secretary of the Treasury for Management in Washington, D.C.; IRS' National Office in Washington, D.C.; the IRS service centers in Cincinnati, Ohio, and Ogden, Utah; and the Fairfax and Springfield, Virginia, offices of Vanguard Technologies, Incorporated. We reviewed various planning, contracting, and technical documents for the electronic filing project. We also reviewed the minutes of IRS' executive-level committee meetings dealing with electronic filing and interviewed officials associated with the project. Our work was performed in accordance with generally accepted government auditing standards.

The information contained in this report was discussed with responsible IRS officials, and we have incorporated their comments where appropriate. This report was prepared under the direction of James R. Watts, Associate Director. Other major contributors are listed in appendix I.

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As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution until 30 days from the date of the report. At that time, we will send copies to interested parties, including the Commissioner of Internal Revenue, and make copies available to others upon request.

Sincerely yours,

A handwritten signature in black ink that reads "Ralph V. Carlone". The signature is written in a cursive, flowing style.

Ralph V. Carlone  
Assistant Comptroller General

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