

COMPUTER CHAOS:

**Billions Wasted Buying
Federal Computer Systems**

**Investigative Report of
Senator William S. Cohen**

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**Ranking Minority Member
Subcommittee on Oversight of Government Management
Senate Governmental Affairs Committee**

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**INVESTIGATIVE REPORT¹
OF
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EXECUTIVE SUMMARY

The Minority Staff of the Senate Subcommittee on Oversight of Government Management recently completed a comprehensive examination of the federal government's practices for purchasing computers. This review was initiated after several reports of failed computer acquisitions indicated there may be significant systemic problems in the way the federal government buys computers and computer-related equipment and services. The findings and recommendations in this report support overhauling the current process for buying major computer and communications systems and emphasize the need for earlier and more effective oversight of these programs.

MAJOR FINDINGS

Government computer systems affect the daily life of every American--from processing tax returns and entitlement benefits to providing weather information for morning commuters. The federal government is the largest single buyer of computers and computer-related equipment in the world. Annual federal computer related expenditures exceed \$25 billion, or almost 5 percent of discretionary federal spending, and have been growing steadily over the last two decades. Unfortunately, weak oversight and a lengthy acquisition process have led to the American taxpayers not getting their money's worth on \$200 billion in expenditures over the last decade.

¹This report includes the findings and recommendations of the Minority Staff of the Senate Subcommittee on Oversight of Government Management. It does not represent either findings or recommendations formally adopted by this Subcommittee.

Effective management and control over such a significant portion of the budget is seriously lacking and the federal government's problems with buying computers is widespread.

The federal government continues to operate old, obsolete computer systems while it has wasted billions of dollars in failed computer modernization efforts. Replacing antiquated computer systems has met with little success because of poor management, inadequate planning, and an acquisition process that is too cumbersome to competitively purchase computer technology before it is obsolete. Efforts by the government to provide greater efficiency and service to the American people will certainly fail unless the process for buying information technology is improved.

Antiquated and Inefficient Computer Systems Cost the Government Billions

The government spends billions of scarce federal dollars operating obsolete 1960s and 1970s era mainframe computers resulting in lower quality of service, inefficient operations, and limited accountability over how taxpayer dollars are spent.

--Outdated Internal Revenue Service (IRS) computer systems have contributed to a \$70 billion backlog in uncollected taxes and unreliable financial records which even the General Accounting Office (GAO) could not adequately audit.

--The nation's air traffic control system is wearing out and portions of the system have been failing at an increasing rate in the last four years. The technology is so old that the Federal Aviation Administration (FAA) must buy vintage vacuum tubes from a manufacturer in Poland and search Radio Shack and junkyards for spare parts to keep the system running. The FAA relies on 1960's mainframe computers that are as large as a truck, but are only 1/10 as powerful as a basic personal computer.

--The Department of Defense (DOD) operates 161 different "major" accounting systems on archaic computer systems, making it difficult, if not impossible, to audit defense expenditures, and forces DOD to rely on contractors to identify government overpayments.

Computer Modernization Efforts Have Failed

The federal government is wasting billions of dollars trying to buy new systems and the inability to efficiently and effectively buy computers has stalled much needed modernization. Evidence of poorly managed systems is pervasive. Specifically:

--The IRS and FAA are conducting multi-billion dollar computer acquisitions that are in serious trouble, resulting in billions of dollars in cost overruns, schedule delays, and massive program changes. The IRS is on its third unsuccessful attempt since 1968 to modernize its computers. The FAA air traffic control computer modernization, plagued by poor management and billions in costs overruns, was recently restructured after a ten year modernization effort came to naught.

--The Farmers Home Administration manages its loan portfolio manually by using color-coded index cards despite spending \$200 million on computer systems to perform this task.

--DOD claimed that \$36 billion would be saved from efficiencies generated from the Corporate Information Management computer program by 1997. The effort, begun in 1989, has made little progress and still requires significant planning and high-level management attention. Because defense budget cuts were made based on the phantom savings to be derived from this program, difficult decisions will have to be made in the future on whether to increase defense spending or cut critical defense programs and military readiness.

Government Planning Efforts are Inadequate

The government does a poor job planning its computer purchases. Agencies do not spend enough time reviewing their processes and practices before undertaking these expensive automation programs. Management's limited vision of how it wants its business to work also contributes to poor planning.

--Of the 74 reports written by GAO on information management since 1990, over half identified projects where agencies had no idea what new computer systems would eventually cost or exactly what they would do.

--Seven years into the IRS's \$7 billion Tax Systems Modernization project, the agency still must define what it wants the system to do. Only then can IRS establish what kind of hardware and software it wants industry to provide. GAO remains concerned that the IRS is developing non-compatible parts and continues to buy hardware without knowing how it would fit into a single, coherent system.

-- The National Weather Service's nearly \$500 million Advanced Weather Interactive Processing System (AWIPS) does not have an overall design, or architecture to guide development. AWIPS segments are incompatible with each other, its software is written in several different computer languages, and the program will require a costly effort to integrate its assorted segments.

The government's plans for purchasing computers result in gold-plated requirements and grandiose projects that agencies cannot effectively manage. Compared to the private sector, the government spends too much time and effort developing unique software programs and hardware rather than buying commercially available products. This is in large part due to limited incentives to save taxpayers' money and to the government's unwillingness to compromise on what is really required to do a job. The government also embarks on significantly larger projects than the private sector rather than incrementally developing systems by dividing them into more manageable and compatible segments.

The Computer Buying Process Condemns the Government to Pay More for Less

The current approach to federal regulation of computer purchases is outdated and takes little account of the competitive and fast changing nature of the now global computer industry. The computer systems acquisition process was designed when the federal government dominated the computer market which is now no longer the case. Thirty years ago, the federal government purchased over 62 percent of the entire U.S. computer industry's output. Today, this share has fallen to 3.5 percent.

The process of acquiring federal computer systems takes significantly longer than developing new technology. This increases the likelihood that technology will be obsolete once delivered. Exercising non-competitive technology transfer clauses in computer contracts to overcome this time-technology dilemma makes a mockery of the idea of competition and results in excessive cost. The government now conducts laborious competitions for systems that will be obsolete once the contract is signed. If the government wants the latest technology, the competitive process in effect becomes a bidding war for the right to be a monopoly supplier for a system that did not exist at the time of the original competition.

Compared to other federal procurements, computer procurements suffer from an additional, burdensome, protest process. On large contracts, there are incentives for contractors to make unnecessary protests that are often based on strategic business reasons. The looming threat of protests encourages agencies to take longer than necessary preparing and evaluating proposals. The costs to the taxpayers from computer protests includes court and personnel costs, and delays in acquiring computers. These delays contribute to continued inefficiencies, greater obsolescence of purchased systems, and in many cases, result in a costly renegotiation with the winning contractor for the latest technology.

Although current law designates the General Services Administration (GSA) as the chief agency responsible for computer purchases, GSA's actual authority is circumscribed by being excluded from the requirements process. Responsibility for computer procurement is highly decentralized with no single focal point to provide

effective oversight. The government camouflages its lack of oversight and pays deference to existing law through a bureaucratic process where GSA "delegates" its purchasing authority to agencies. This process is fundamentally flawed and wastes valuable personnel resources while providing marginal benefits to the taxpayer. The prospect for enhancing GSA's oversight role is problematic because of a lack of agency resources, an emphasis on process rather than results, and questionable expertise as evidenced by ineffective management of its own computer programs.

The government is faced with a serious dilemma. To modernize its systems on a "business as usual" basis without adequate planning leads to significant waste. Not acting relegates the government and the American people to the costly solution of making do with outmoded technology. It is indeed unwise to spend money to maintain the government's old systems that have outlived their usefulness. Planning for modernization provides an excellent opportunity for agencies to evaluate and redesign existing administrative processes to ensure automation achieves the most benefit for the government and the taxpayers.

Buying federal computer systems should be a high profile issue because of the cost and the potential for these systems to improve government operations. Computer modernizations are the largest acquisitions most civilian agencies will ever undertake and the Congress owes it to the taxpayer to provide effective oversight. At the same time, efficient systems are desperately needed to improve the federal government's management and control of the use of taxpayer dollars. Most agencies cannot track where their money goes, leaving them open to billions of dollars in waste, fraud, and abuse. Unfortunately, it becomes a vicious cycle as the government is just as inept in buying computers as it is in using them for accounting. Efforts to prevent abuse, provide oversight, and improve accounting systems cannot be effective unless the government learns how to efficiently purchase computers. The system is indeed broken and it is time to fix it.

RECOMMENDATIONS

Congress and federal agencies should consider the following options to remedy the problems that exist in the way the federal government buys computer systems:

- 1) **Emphasize early oversight and planning:** Target oversight of computer acquisitions on the early phases of programs to encourage agencies to reevaluate how they do business before spending money on automation.
- 2) **Reduce bureaucratic barriers to purchases:** Replace the Delegation of Procurement Authority process with an approach that provides meaningful oversight over early planning. Establish one forum for reviewing all contract protests, and streamline internal agency review processes which add months to purchasing time and

result in the acquisition of outdated technology. If the government cannot reduce the time it takes to competitively buy computers before they are obsolete, it should consider alternatives such as leasing, task order contracts, and privatization of federal computer services and operations.

3) Avoid reinventing existing technology: Ensure that developing unique systems is the exception rather than the rule. It should be rare for the government to purchase anything but commercially available hardware and software.

4) Size projects to manageable levels: The government should address automation in manageable segments that are compatible with other systems and easily canceled if they run into any cost or schedule difficulties.

5) Encourage innovation: Establish pilot programs to try new procurement ideas. As technology changes, what is appropriate in today's buying environment may be obsolete tomorrow. No one has a monopoly on good ideas and the government needs to be flexible incorporating new technology.

6) Create incentives for the government and contractors to perform: Allocate agency information budgets based on past management performance in meeting cost, schedule, and performance goals. While cost should remain a significant factor, the government should select computer contractors as much as possible based on past performance and reputation.

7) Communicate lessons learned: Encourage the foundation of interagency advisory working groups to share experiences with federal computer system acquisitions. Industry-government communications should be enhanced during all phases of the acquisition cycle. An on-line data base with agency comments on contractor performance should be established and made available to agencies buying computer systems.

8) Reevaluate existing procurements and halt new procurements until the computer acquisition process is improved. Suspend and review existing large computer system acquisitions to determine if current agency plans for automation will achieve the best value for the taxpayer. Halt new large computer procurements until the government improves the computer acquisition process and can ensure effective planning, cost effectiveness, and timely delivery of new systems.

Minority committee staff will continue to investigate these problems and Congress should explore the recommendations made in this report through hearings and legislation.

William S. Cohen
United States Senator

INTRODUCTION AND SCOPE OF INVESTIGATION

For the past year, the Minority Staff of the Subcommittee on Oversight of Government Management, Senate Committee on Governmental Affairs has investigated how the federal government purchases computer equipment.² This review was undertaken in response to increasing accounts of deficiencies in the way the federal government buys computer systems.

As part of its investigation, the Minority Staff reviewed a long history of extensive reports and testimony on information systems by the General Accounting Office (GAO) and departmental Inspectors General (IG). Dozens of computer acquisition programs were examined by the Minority Staff. In addition, the Minority Staff questioned officials in over 50 federal departments, agencies, bureaus, and offices. The officials were asked about problem areas and procurement related changes that they believe are necessary at the federal level. The sample included both large and small users of computer equipment.

Background

Government computers affect the life of every American. Without modern and efficient computers, for example, the Pension Benefit Guaranty Corporation cannot monitor pension plans to ensure they are financially sound; the Social Security Administration cannot keep retirement checks coming to the nation's senior citizens; the Department of Agriculture cannot track payments to farmers; and the Departments of Labor and Commerce cannot monitor national business trends. These are only a few examples of the federal government's overwhelming dependence on computers.

Besides serving as the heart of the government's financial management systems, computer information systems function as the foundation for deterring waste, fraud, and abuse. Computers also serve as integral parts of government systems to protect the public health and safety. For example, every day passengers rely on the critical performance of Federal Aviation Administration (FAA) computers to track flights and ensure that planes do not collide. If the air traffic control system is unreliable or fails, not only tax dollars are at stake, but also the lives of our nation's airline passengers.

To meet the diverse needs for processing information, the federal government has become the largest single buyer of computers and computer-related equipment in the world, spending over \$25 billion a year on computer equipment and services.³

²Throughout this report the term "computer systems" will be used in place of the phrase commonly associated with government regulations, "automated data processing equipment," which includes computers, software, and telecommunications equipment.

³Federal expenditures on computer systems are actually much higher than \$25 billion if funds for defense C4 (Command, Control, Communications, and Computers), intelligence systems,

Thousands of telecommunications and computer systems are acquired each year, integrating hardware, software, data, and people to perform the government's business. Annual federal computer expenditures constitute almost 5 percent of all discretionary federal spending and 12.5 percent of all government purchases of goods and services. Computer expenditures have been growing at a rate of 6 percent a year since 1983 in an era of declining expenditures elsewhere. As shown in the following table, the Department of Defense spends 37 percent of the government's computer budget and is the largest purchaser of computer systems followed by the Department of Transportation (primarily the Federal Aviation Administration) and the National Aeronautics and Space Administration.

FEDERAL COMPUTER BUDGETS BY DEPARTMENT FY94

AGENCY	FY 1994 BUDGET	% OF TOTAL COMPUTER BUDGET
Defense ⁴	\$9,491,039,000.00	37.7%
Transportation	\$2,482,504,000.00	9.9%
NASA	\$2,127,654,000.00	8.3%
Energy	\$1,792,404,000.00	7.1%
Health and Human Services	\$1,787,843,000.00	7.1%
Treasury	\$1,772,869,000.00	7.1%

Since information technology comprises a significant portion of the federal budget, effective management and control over these funds is essential. Despite the amount of resources expended, and the critical dependence of federal programs on accurate, up-to-date computerized information, Congressional and agency oversight has been disturbingly limited. The Minority Staff strongly believes it is time for Congress and the public to focus attention on this issue.

At this point, a distinction needs to be made between commodity and systems computer acquisitions. Commodity purchases are primarily hardware and packaged

and computer technology embedded on weapons systems platforms are included.

⁴Army--\$2.261 billion, Navy--\$2.226 billion, Air Force--\$2.091 billion, Marine Corps--\$0.195 billion, and other defense--\$2.716 billion.

software readily available from vendors on a commercial basis. Agencies can choose to buy these products from GSA or independent contractors. System procurements are another matter, and the greatest inefficiencies in the way the government buys computers are in this area. Computer systems acquisition is the process of developing and managing the integration of hardware, software, information, and personnel into a cohesive unit to meet the government's accounting, management, and service delivery needs. This can range from a small scale link-up between commodity computers in one division of an agency, to building a new system that integrates disparate payroll and accounting systems, to developing new software and custom hardware to tie together satellites, radars, and data processing centers with global users of this information. While there are many flaws with buying commodity products, this report focuses primarily on the more problematic computer systems acquisitions.

FINDINGS

As a result of its investigation, the Minority Staff found that computer purchases are poorly managed, the process is unnecessarily burdensome and complex, and government efforts to provide effective oversight have failed.

Finding 1: The failure of the government to effectively buy needed computer equipment and services has wasted billions of dollars.

The federal government has spent over \$200 billion in the last ten years to buy computer systems that are often incompatible, obsolete, and inappropriate for their intended tasks. As a result, the government cannot efficiently manage and implement many of the programs it administers because the information it needs is, in many cases, unavailable, incomplete, or in an unusable format. The government relies on computerized systems to manage information and to track taxpayer dollars as they are spent. While these systems are expected to identify and deter fraud, they are old and inefficient, making fraud that much easier to perpetrate.

As a result of antiquated, incompatible, and poorly designed computer systems, agencies have lost track of billions in taxpayer dollars. GAO cannot make sense of most agencies' accounting systems, and the Office of Management and Budget (OMB) has singled out federal information and accounting systems as some of the most troubled areas in the government. For example:

--While the Department of Agriculture was responsible for over \$80 billion of taxpayer money last year, OMB states that these funds are at risk of loss or being spent in the wrong way due to unreliable computer-generated

management information.

--Financial systems at the Department of Commerce are seriously outdated, expensive, and difficult to maintain, putting at risk over \$3.4 billion in expenditures.

--DOD's financial accounting systems produce inaccurate and unreliable data, exposing the Department to over hundreds of millions of dollars in stolen or lost goods. Additionally, DOD has identified over \$41 billion in payments it cannot match up with invoices.

--The Department of Education cannot produce reliable financial reports on over \$60 billion of outstanding loans and \$31 billion in yearly expenditures, loans, and grants. Poor information tracking has resulted in the outlay of millions of dollars of unauthorized student loans.

--The Department of Housing and Urban Development lacks effective control over \$100 billion in contracts and cannot determine if its funds are being used for eligible recipients. The Department of Energy cannot ensure that \$17 billion it spends on contractors each year is being efficiently spent.

Unfortunately, the list of similar problems goes on and on, and includes most other federal agencies and departments.

Compatibility is a major problem with governmental computers. Currently, no uniform government-wide standards for computer technology exist to ensure that computer systems can talk to each other. Few, if any departments have standards to ensure that all systems within the department can communicate. For example, the Department of Veterans Affairs operates at least 150 different computer systems, while the Department of Housing and Urban Development maintains about 75. The degree these systems work together and share information is minimal or nonexistent.

DOD operates 161 different "major" accounting systems and hundreds of "minor" systems on old, incompatible mainframes.⁵ DOD maintains thousands of incompatible information systems at more than 1,700 data centers. For all this computing capacity, DOD must rely on contractors to tell them if the government is overpaying them because DOD's computers and accounting systems cannot identify these overpayments. In just a six-month period in 1993, contractors returned \$751 million in overpayments, virtually all of which contractors had identified as not owed to

⁵A mainframe is essentially a large computer. In the 1960s, all computers were mainframes. Changing technology and the development of the microcomputer, minicomputer, personal computer and workstation, have reduced the number of mainframes operated by private industry and the government.

them. One can only imagine how much money is not returned.

According to the DOD Comptroller, computerized financial systems share no common terms; concepts and data from one system must be retyped and reformatted for use in another. The Comptroller further stated that DOD is

often unable to obtain correct information from the data stored in the various existing databases due to a lack of standardized data structures across systems. Submitting the same query to each of the more than 20 payroll systems can result in not just multiple answers, but in multiple kinds of answers. At times, consolidating the query responses has proved to be an impossible task.

As a result, DOD financial statements cannot be audited and it takes a tremendous effort to verify financial discrepancies. Further, information sharing problems in inventory systems have contributed to DOD buying \$30 billion of spare parts it did not need.

Despite these well-known and historic problems, the government is currently failing to adequately address compatibility issues in systems under development. The Department of Agriculture has 17 major computer systems under development at a cost of \$6.3 billion. It has not, however, coordinated the development of these systems to ensure they will be able to communicate with one another. The Agency for International Development (AID) maintains 45 different computer systems to track its property around the world and manage its operations. Most of these systems cannot share data with one another, and despite these computer systems, AID cannot adequately account for thousands of motor vehicles and millions of dollars of property at its foreign posts. OMB has recently identified AID's new computerized financial system as a high risk area and is concerned that the agency cannot satisfactorily account for its \$7 billion budget and oversee its contractors.

Law enforcement work would be enhanced by effective computer modernization. The Federal Bureau of Investigation, Customs Service, and Secret Service would benefit greatly if their computers could communicate with each other and provide immediate access to critical law enforcement information. Sufficient computer capabilities can make the difference in catching a deadly criminal, interdicting a shipment of drugs, or assimilating the tremendous amount of information that flows through the government's hands. Computer systems at the Immigration and Naturalization Service (INS) are also woefully inadequate. INS information is primarily located in paper files that have to be manually shipped to immigration officers--a process which takes months--leading to INS being unable to identify, apprehend, and deport criminal aliens. Information inadequacies have contributed to INS not collecting millions of dollars in penalties, breached bonds, and fees.

The failure to modernize computer systems results in billions of dollars of lost revenue to the federal government. For example, the Internal Revenue Service (IRS) is currently using outmoded technology to process tax returns. Antiquated computers have contributed to the IRS's failure to collect over \$70 billion in delinquent taxes from individuals and corporations. In an attempt to capture these funds, the IRS plans to invest \$23 billion over the next decade to update and operate its tax collection systems, but evidence suggests that the IRS has poorly planned the initial stages of this procurement and the billions of dollars in back taxes will remain uncollected.

The failure to modernize and automate properly also contributes to massive waste, fraud, and abuse. Effective use of computer matching among agency data bases and programs designed to detect fraud could save the taxpayers billions of dollars. Government computers are presently inadequate for detecting mistaken payments or the \$100 billion per year in federal health care fraud. For example, computer systems at the Health Care Financing Administration (HCFA) fail to detect fraudulent payments and overcharges, costing untold billions and significantly contributing to the high cost of health care. HCFA paid out over \$1 billion for services already covered by other insurers, in part because of computer deficiencies. Similarly, computers at the Departments of Education and Agriculture permit thousands of unqualified borrowers to receive federally insured loans, while data problems and old systems at the Department of Veterans Affairs and Social Security Administration permit benefit payments to those who are ineligible. Overpayments and payments to ineligible people are a serious problem with most entitlement programs and exceed \$750 million a year for the Supplemental Security Income (SSI) program alone. Most of this will never be recovered, due to time limitations and overburdened agencies. Computer modernizations at these organizations could help to identify fraud and overpayments, while freeing up agency resources to focus on recovering this money.

The government spends billions of dollars operating so-called "legacy" systems, which are old mainframe computers from the 1960s and 1970s. These systems are antiquated, expensive to operate, and incompatible. They contribute to vast inefficiencies in government management, and are in dire need of replacement. The defense legacy systems inventory includes obsolete electronics, technology, and systems designs, which are up to 30 years old. The cost of operating old computer systems consumes an enormous portion of the total DOD information technology-related budget. It costs the IRS nearly \$1 billion per year to operate its existing computer systems. The FAA has not been able to update its computer systems since the mid-1960s. Air traffic control technology is so old that the FAA must search Radio Shack for spare parts and buy vacuum tubes from a manufacturer in Poland to keep the nation's air traffic control system running.

The FAA is not the only agency that relies on old computers to help protect the public. National Weather Service computers also help protect lives and property. Hundreds of lives and billions of dollars worth of property are lost each year from the ravages of thunderstorms, tornadoes, hurricanes, blizzards, and floods. The National Weather Service, however, must rely on rudimentary computer systems and outmoded radar technology

which have failed to identify the severity of major storms and floods and have been unable to provide prompt warning to the public. According to a report by the National Weather Service, improved computer processing and communications during the Great Flood of 1993 could have saved hundreds of millions of dollars in damages and dramatically reduced human suffering. Unfortunately, the program to modernize the nation's weather systems has ballooned in cost from \$1.4 billion to \$4.6 billion and GAO is concerned that the proposed \$500 million National Weather Service computer system modernization is inadequately planned and will result in higher long-term costs.

Finding 2: Acquisitions of large computer systems are poorly managed and subject to cost overruns and schedule slippages. Program instability, misplaced incentives, and unrealistic expectations have frustrated efforts to successfully buy computer systems.

In the 1980s, American taxpayers were outraged by a long litany of "The Pentagon Horror Stories"--tales of \$400 hammers, \$600 toilet seats, and billions of dollars in cost overruns on aircraft, tanks, satellites, and missiles. Unrealistic schedules, low bids, and technological optimism left hundreds of military programs behind schedule and over cost. In the 1990s, federal computer acquisitions have a chance to equal the Pentagon's earlier foibles and, in some cases, surpass them.

The development and testing of large government computer programs can be as difficult to manage as any weapon systems acquisition. Like weapon systems there is an incentive for agencies to initially focus on buying the platform--the computer hardware--rather than on software development and future personnel and operating costs. Decision makers may feel more comfortable reviewing something tangible, and agencies may push to buy into hardware before adequately thinking through what to do with it. Once the large hardware costs are incurred and the program bought into, inevitable problems with software development to tie together diverse hardware occur. At this point, it becomes extremely difficult to cancel or modify the program. Funds are allocated for cost-type⁶ software development contracts, which raise overall program costs.

Large computer acquisitions demand greater attention, because history shows that they are not being managed in the most cost efficient manner. Within the last four years, GAO published 74 reports on information technology programs. The reports identified problems with requirements analysis, management, cost/benefit analysis, and limited competition (see Appendix A). The problems with buying computer systems have a long history. A 1965 summary of 96 GAO reports identified many of the same managerial

⁶ A "cost contract" is an open-ended category of contracts where a contractor is paid "allowable costs" for work performed. Incentive fees are used in an attempt to control costs. In comparison, a "fixed price contract" sets a firm price for what government will pay to complete the required work.

deficiencies with computer systems procurement seen today. In 1965, this evidence led Congress to attempt to centralize computer systems procurement within GSA. Almost thirty years later, GAO is still publishing troubling reports while also criticizing GSA practices. Why has so little changed?

Agencies such as the IRS and the FAA are conducting huge computer system acquisitions that are in serious trouble. Despite spending billions of dollars over the past three decades trying to update these systems, the government is still not any closer to modernizing and must rely on outdated and inefficient technology. Estimates for one portion of the FAA modernization of the nation's air traffic control system, the Advanced Automation System (AAS), rose from \$2.5 billion to over \$7 billion before the program was severely curtailed due to rising costs. The FAA now plans to spend twice as much as originally planned for a system that will meet few of its original requirements. The FAA's air traffic control system modernization, begun in 1981 was estimated in 1993 to cost \$32 billion--most of which is for computer systems. Another portion of the FAA modernization, the Microwave Landing System, was cancelled this year after spending \$400 million because advances in technology had overtaken the snail's pace of the government's acquisition process.

The FAA's management of the AAS program reveals many of the inherent problems with program management in the government. An independent evaluation of the program by the CNA Corporation stated that: 1) The FAA does not have the necessary management and engineering expertise to undertake such a large program; 2) the management process lacked discipline and authority; 3) responsibility was not clearly assigned; and 4) accountability was absent. The report went on to say that "FAA leadership did not enforce milestones, assess performance, or fix individual responsibility." Many of the problems with AAS were raised by support contractors early in the program, but this information was ignored by FAA managers and had a limited distribution.

Two previous attempts in the last two decades to modernize IRS computer systems failed and the most recent attempt begun in 1986 has been plagued by poor planning and wasteful changes of direction. The IRS now plans to invest \$7 billion for new computer systems in the years 1993 to 1997 and a total of \$23 billion before 2003. The program, known as Tax Systems Modernization, has recently been criticized for inadequate planning and requirements definition, old cost estimates, and overly optimistic technological assumptions. In response, Congress cut \$340 million from the \$989 million that the President requested for the program. While this program was in trouble to begin with, these cuts will, based on past experience with weapons systems programs, dramatically increase overall system costs, stretch out the program schedule, and force IRS to fund paper studies to keep contracting teams together in the event funding is restored. Program restructuring and capability decreases are likely in the near term. IRS program officials confirmed the Subcommittee's assessment of the anticipated effects of proposed budgetary cuts on the modernization effort.

Examples of other troubled federal computer purchases abound:

- The Federal Deposit Insurance Corporation (FDIC) failed to develop a workable computer system to track asset values and calculate interest payments despite having closed down hundreds of banks with operating computer systems that essentially did the same thing. As a result, FDIC did not maximize the government's revenue when liquidating bank assets, asset values could not be easily tracked, and loans went uncollected.
- The Resolution Trust Corporation designed its computer systems without consulting its users. According to GAO, this led to millions of dollars in wasted investments and lost opportunities to track and dispose of more than \$100 billion in hard-to-sell assets.
- DOD's failure to modernize its computer systems will have a serious effect on military readiness and DOD's ability to purchase major weapon systems. DOD's Corporate Information Management (CIM) program is one of the largest information management initiatives ever undertaken and is designed to streamline systems and eliminate duplication. DOD claimed that \$36 billion would be saved from efficiencies generated from this program by 1997. The program is, however, nowhere near implementation. Interservice rivalry, inadequate planning, and ineffective management have plagued its progress. As defense budget cuts were made based on the phantom savings to be derived from CIM, hard decisions such as cutting programs or readiness will have to be made in the future.
- The federal government paid the states over \$1 billion to develop computer systems for reducing errors when determining eligibility and processing claims for Aid to Families with Dependent Children, Medicaid, and Food Stamp programs which collectively provided more than \$119 billion in benefits in 1993. Federal monitoring of these state computer programs were lax, resulting in millions of dollars spent on systems that did not meet requirements or did not work. Thus, processing errors will continue to contribute to billions of dollars in unnecessary costs to the taxpayer.
- The Farmers Home Administration manages its loan portfolio manually by using color-coded index cards despite spending \$200 million on computer systems to perform this task. In addition, after spending over \$500 million modernizing its financial management systems, the effort was stopped before completion after management found out it did not really know what it was getting from its investment and the systems would not provide for effective oversight and fraud detection.
- The National Institutes of Health (NIH) spent \$800 million on several mainframe computers that its researchers refuse to use. Apparently, NIH did not ask its users--who thought that personal computers and minicomputers were better suited to their research--what they wanted before committing almost a billion dollars of taxpayer money. Some of the mainframes were subsequently sold and the rest perform administrative tasks, using only a fraction of their capacity.

The federal government's problems buying computer equipment should not be surprising, as federal computer systems are generally bought like most other goods and services. The procurement system for goods and services is fraught with misplaced incentives which reward optimism rather than results, whether it be in a contractor proposal or an agency's estimate of costs. The contractual agreement with Congress to fund these programs is broken when reality intervenes and optimism is dashed. As cost estimates rise, Congressional scrutiny becomes intense and funds are slashed, leading to further schedule delays and greater long term costs. Current year funding may barely cover the contractor's overhead. As a result, the government spends millions of dollars on paper studies and limps along with existing systems or settles for a scaled back version of what it originally wanted, at three times the original price and one-third of the capability.

It is fairly easy to identify problem acquisitions. Identifying why these programs are in disarray is another matter. A good first start, however, is to focus on the systemic problems at the root of most system acquisition problems: management, program, funding, and requirements instability; lack of competition; and unrealistic expectations about technology, cost, schedule, and funding levels. The effort to manage these variables while guiding a procurement through the complexities of federal acquisition regulations is almost an impossible task. Attempts to reform the more systemic problems with federal acquisition have largely been a Sisyphean effort.

Finding 3: The federal government has failed to adequately plan its purchases of computer systems. Focusing more effort on the early acquisition phases is imperative to future success.

The early phases of computer acquisition are critical. This is the time to define requirements and intelligently and rationally decide how to spend billions of dollars of taxpayers' money on computers. These early phases, however, are seriously lacking management attention. This is because relatively little money is spent up-front and no hardware or software is developed. In the early stages top management is relatively unconcerned or indeed unaware of what is going on in the program. By the time problems arise and cause inevitable cost and schedule increases, it is often too late to save the government any money. Poor initial planning results in billions of dollars in wasted resources.

The early phases of program acquisition hold the key to future costs. Decisions made in the initial stages of a program--where perhaps 10 percent of funds are spent--will determine the majority of the total program costs. This is why the 1986 Packard Commission on defense acquisition focused on improving early requirements definition in defense programs. The Packard Commission's conclusion that the federal government must spend more money and time on engineering at the beginning of a program to obtain more reliable and better performing systems more quickly and cheaply is relevant to computer acquisition today. The early phases of the computer acquisition process should

be the key areas for further oversight. This is where the government can get the most benefit for its oversight expenditures by identifying problems before they become costly.

GSA's recent proposal to provide greater oversight for troubled programs is helpful, but the real challenge to the government is devising a system which can prevent later problems from developing. Since the requirements definition process is the point of maximum leverage and the source of many subsequent cost increases, effective analysis at this point should prove effective in managing successful programs.

Unfortunately, the government does a poor job in defining requirements, and spends an inordinate amount of time doing so. This indicates that something is seriously wrong with the requirements process. For example, GAO testified in March 1994 that seven years into the Tax Systems Modernization project, the IRS still must define what it wants the system to do. Only after the IRS figures out what it wants its system to do can it establish what kind of hardware and software it wants industry to provide and have a firm idea of what the system will cost. GAO remains concerned that the IRS is developing non-compatible parts and continues to buy hardware without knowing how it would fit into a coherent system.

The IRS program is not alone. Many agencies have failed in the front end planning of computer programs. Inadequately defining requirements was the most frequently identified problem in computer systems procurement that GAO has reported on in the last four years. GAO found that agencies were trying to update their computer systems before they had rethought and reformed their business practices. For example:

--GAO has criticized the National Weather Service's nearly \$500 million Advanced Weather Interactive Processing System (AWIPS) for not having an overall design or architecture to guide development. Adequate planning could have prevented AWIPS segments from being incompatible with each other. AWIPS software is written in several different computer languages and will require a costly effort to integrate its assorted segments.

--The FAA's Advanced Automation System was plagued by inadequate early planning. Program requirements were never finalized and were continuously adjusted which resulted in unnecessary added costs.

--The Federal Crop Insurance Corporation embarked on a new computer acquisition, before it clearly analyzed its needs. This \$62 million effort will result in wasted dollars if proposed reorganization within the Department of Agriculture changes the crop insurance program.

The government must first make needed changes to its processes and practices before undertaking automation programs. Successful computer purchases depend on knowledge of how management wants its business to work. Billions of dollars in

governmental efficiency can be gained through effective automation only by first reforming administrative practices. Administrative reform holds the potential for significant savings throughout the government and frees up resources which can be used more effectively for other goals. One area requiring further scrutiny is the administrative cost associated with official travel. For example, the Director of the Defense Performance Review recently stated that the Department of Defense spends more on processing travel vouchers than on the travel itself--an estimated \$2.3 billion to process \$2 billion worth of travel vouchers. While this may be an overstatement, the costs required to process each voucher are still significant. Seventeen steps are required in order to get approval for travel, fill out and review the voucher, pay the traveller, and finally audit the returns. Streamlining the number of steps and then automating the process hold the potential for significant savings which could be replicated in other equally inefficient governmental operations.

In contrast, the government has followed the standard procedure of automating an inefficient process. For example, the Department of Veterans Affairs (VA) has been trying for the past ten years to modernize its computer systems to reduce the number of days required to process compensation claims. The VA has spent hundreds of millions of dollars and not achieved any appreciable reduction in processing time. It now hopes to spend \$206 million to reduce the processing time of compensation claims from 180 days to 106. Two years into the new program, however, claims processing time has actually increased to 225 days. Instead of throwing greater amounts of technology at the problem, the VA should look more at the process and determine why it takes so long when compared to claims processing times of private sector health care providers. These comparisons are critical, as the VA proposes spending over \$500 million on information technology for VA hospitals to respond to changes in the health care system.

The challenge in computer systems acquisition is focusing attention on these early phases and forcing agencies to look at why they do things the way they do. Too often, by the time the auditors find out that agencies have not done an adequate job planning, millions of dollars and years of effort have been wasted. The government is then faced with unappealing options: write off this work and start over, or confront the inevitable cost and schedule increases to modify the program and simultaneously performing requirements analysis and development. A smarter choice is to do the job right the first time.

The federal government should explore more creative approaches to the vital initial phases of a program--those of identifying requirements and planning resources. Senior acquisition officials have, however, told the Subcommittee that most agencies spend too much time defining requirements for computer programs and creating ridiculously detailed requirements. These requirements close off options to the government, such as the purchase of commercial off-the-shelf software which is infinitely cheaper than having contractors write custom programs. Requirements should be flexible and agencies should explore ways to maximize usage of the commercial marketplace. Agencies should look more at streamlining their business practices and designing their computer systems requirements around these new processes. Independent evaluators and users of computer

information should be actively involved in the questioning of agency assumptions and requirements. Most importantly, a trade-off needs to be made between the features that are optional and those that are the truly necessary. Unnecessarily detailed requirements skew decisions towards developing a unique custom-designed system rather than compromising on a commercially available product that meets the majority of agency needs.

Finding 4: Acquiring computers in the government takes significantly longer than developing new technology, increasing the likelihood that hardware will be obsolete once delivered. Methods to overcome this time-technology dilemma make a mockery of the idea of competition and result in excessive costs.

Computer technology is developing rapidly while the government's acquisition process moves at a glacial pace. The budgeting, review, and contracting processes are taking much longer than the time it takes to develop new computer technology. The so-called "Moore Law," which states that processor technology will double every 18 months, has dominated the computer industry for the last two decades. But the government contracting pace has not been able to keep up with changing technological developments. According to administration estimates, it takes the federal government an average of almost four years to purchase computers compared to 13 months in the private sector. Many of the reasons for the slowness of the computer procurement process reside with the agency and the time it takes to conform with federal acquisition regulations.

Determining what an agency will buy, obtaining funding approval within the agency, OMB and Congress, preparing a contract solicitation, receiving and evaluating bids, and finally getting a contractor to work on a program is a long and arduous process. For computer systems procurements, this is an ongoing effort. Many different contracts and budgetary cycles are necessary to carry a program through defining requirements, translating those requirements into concepts, developing technology, validating that technology, testing prototypes and sub-systems, manufacturing and integrating the final product, and maintaining and operating the system. This takes years, and sometimes decades, of effort. Meanwhile, technology is constantly changing. But even for commodity systems, the current contracting process makes it difficult for the government to buy state-of-the-art equipment.

The process to award a computer contract once an agency has developed requirements (which in itself takes years) and gained approval from GSA is extremely time-consuming. For example, the Army was granted approval authority from GSA in September 1992 for its \$1.5 billion Common Hardware/Software II contract. A request for proposal was issued in April of 1993 and awarded in September of 1994--25 months from the date authority was granted, or almost one and one-half technology cycles later. The IRS Service Center Support System request for proposal was issued in April of 1992 and was expected to be awarded in March of 1995--36 months, or two technology cycles later. The effect of the length of the contracting cycle can be seen in a recent procurement conducted by the

IRS. The Totally Integrated Exam System designed to provide laptop computers to IRS agents began in 1987 and was not fielded until 1993.

Agencies are attempting to compensate for the lengthy acquisition process by using technology refresher clauses in their contracts. These clauses allow agencies to negotiate with the winning contractor to buy the latest technology. This has several drawbacks, not least of which is that these clauses make a mockery of the concept of competition in federal contracting. Specifically, the government undertakes laborious and time consuming competitions in order to achieve the lowest possible price for goods and services. Ironically, the use of technology refresher clauses in essence turns the process into a competition for the right to bid to the government in a sole source environment. After the contract is finally awarded, an agency is faced with a choice of taking delivery of older technology which is no longer state-of-the-art, paying a potentially higher price for newer technology without the benefit of competitive pressures, or starting all over again with another bidding process placing the agency in a similar position two years hence. Meanwhile, the need to spend appropriated dollars forces agency action. Contractors, on the other hand, must win the competitive bid to be placed in a monopoly situation. They, therefore, have an incentive to be overly optimistic on their proposals. The government then spends months or years evaluating proposals for fictional systems that most likely will never be developed.⁷

Private industry has also been challenged to incorporate information technology. There have been failures, but also many successes. Differences apparent in private industry computer development include shorter evaluation times, the use of past performance measures and commercial technology, and the scale of projects undertaken. The reduction of developmental risk is highly valued in the private sector as the consequences of failure will be felt on the bottom line. For example, United Airlines information systems subsidiary built its computer systems in incremental modules, minimizing the risks involved in an "all or nothing strategy." Federal Express's risk reduction strategy involved testing the feasibility of the technology of its tracking system, developing and testing a prototype system, and then implementing its system in phases within different operating groups. In the government, however, there are very few incentives to limit risk--the money keeps coming even if the program fails, as the need for automation still exists.

After repeated failures, many agencies are throwing up their hands, admitting they cannot incorporate changing technology or manage on the scale of typical government programs, and are adopting an "evolutionary approach" to buying computers. This essentially means that they will meet their mission by automating on an incremental basis.

⁷On large commodity purchases this dilemma can be overcome by the use of multiple awards to keep competition alive when negotiating technology upgrades. The option of purchasing personal computers through what is known as offloading, which lets an agency buy from another agencies contract, can also exert competitive pressures on the pricing of new technology.

buying the latest technology and hoping that they can integrate these systems with new technology in the future. In theory, this is achieved by adopting an "open system" approach to buying computers. Open systems are essentially computer systems that are designed to remain compatible with future systems. The degree to which open systems actually do this is questionable.

While the evolutionary acquisition approach has some advantages, such as getting technology into the field faster, it has the serious drawback of making it difficult to measure performance in the traditional sense using cost, schedule, and performance yardsticks. For example, the Patent and Trademark Office in the Department of Commerce is undertaking a \$1 billion effort to automate the patent applications process. Patent information is a strategic resource which has a great bearing on our international competitiveness. Accessing this information quickly and streamlining the application process could have the effect of speeding U.S. products to market. Unfortunately, this project, begun in 1983, is being overtaken by advances in technology. Oversight has been inadequate and the evolutionary management approach being used has left costs and schedules uncertain and Congress with little appreciation of what it is buying at the end of the program.

In recent years, the Navy has adopted evolutionary acquisition and open system approaches for its Copernicus Command, Control, Communications, Computers, and Intelligence (C4I) architecture. Copernicus is designed to integrate future developments in space and electronic warfare, warning, global communications, and ship board computing. The Navy is trying to manage technology with quick turnaround procurements every 18 months to keep up with the technology cycle. Other agencies such as IRS which have a critical ongoing mission and cannot afford the risk and down time associated with converting to a revolutionary system may opt for an evolutionary approach.

Evolutionary acquisition appears to be a good approach for managing changing technology, but there are significant tradeoffs. Oversight and accountability is difficult, as oversight officials are always looking at a moving target. Evolutionary acquisition might also mask inadequate requirements analysis and planning, leaving it to the next generation of managers the challenge of making it all work. An evolutionary approach may also encourage agencies to hold on to their legacy systems for a longer period than is prudent costing the government more than is needed to maintain and operate these old systems. Thus, oversight must focus first on overall agency plans or systems architecture. Modules being incrementally developed to fit into the architecture should be reviewed for traditional cost, schedule, and performance measures. Significant problems, such as a 50 percent deviation from program estimates, should result in immediate cancellation of the module.

If adequate oversight can be ensured, evolutionary approaches hold the potential for the government to turn away from the mammoth, unmanageable systems of which government agencies have become enamored. Goals and objectives, ideas, concepts, streamlined business practices, and requirements can be transformed into sequentially developed, manageable sub-systems designed to remain compatible with the next phase of

the program. Given the track record of federal computer systems development, it makes a lot of sense for the government to scale back its grandiose plans and focus on smaller projects.

Finding 5: The current approach to computer systems procurement is dated and takes little account of the competitive and fast changing nature of the now global computer industry.

In addition to operating within the inefficient federal acquisition process, government computer purchasers have an additional bureaucratic system to maneuver through which causes further delays and impedes success. This additional system was created by a 1965 law known as the Brooks Act. The Act provides a unique legal and regulatory framework for computer purchases, but represents a process designed during the 1960s IBM-dominated mainframe era. In practice, this system divides responsibility for information management and technology between OMB, GSA, the National Institute of Standards and Technology (NIST), and individual executive agencies. OMB, GSA and NIST formulate policies, procedures, and standards and monitor the agencies. All federal agencies are responsible for acquiring, managing, and using their information resources in an efficient and effective way.

The Brooks Act evolved as a response to cases of agency mismanagement, concerns about downtime when costly mainframe government computers were not in use, and indecision as to the merits of leasing or purchasing computer equipment. The Act sought corrective measures within a narrow scope. GSA was to become a clearing house for what comprised 90 percent of all government mainframe computer purchases--the commodity computers of the day. GSA's oversight role was limited and agencies retained a great deal of autonomy over their procurement decisions. GSA was not to determine the requirements of agencies. The emphasis was on centrally buying computers and then sharing them. A certain degree of naivety toward emerging technology existed as evidenced by the analysis that GSA was well suited for the task, since sharing computer time would be similar to operating an interagency car pool. At the time GAO believed there was absolutely no difference between buying computers and GSA's purchase of "minerals, precious stones, automobiles, and every kind of equipment imaginable."

Some confusion over responsibility arises from the fact that Congress enacted the Brooks Act to make the GSA responsible for the procurement of data processing services and equipment. The Brooks Act authorizes the Administrator of the GSA to coordinate and provide for the purchase, lease, and maintenance of federal "automatic data processing" (ADP) resources. The Act broadly defines ADP to include computers, accessory equipment, software, and related support services. In 1986, the Brooks Act was amended to include communications equipment in the definition of ADP. At first glance, it would appear that GSA is firmly in charge and that any problems with computer procurement should be laid at the door of GSA, but diffused responsibilities results in finger pointing

between GSA, OMB, and the agencies when systems go wrong.

Although the law states that GSA is responsible for managing federal computer acquisition, the Minority Staff agrees with the House Committee on Government Operations determination in its 1993 report on "Managing the Federal Government" that GSA has become a rubber stamp reviewing authority. In practice, for most computer purchases, the buying agencies have real authority and responsibility, with GSA serving as a bureaucratic hurdle to overcome. GSA's approvals come long before the serious problems with a program surface. GSA is attempting to reform itself and focus on serving its legally defined function, but has not yet applied the resources to do the job successfully.

The federal government needs to periodically review the process for buying computer systems and make changes where appropriate. Three decades later, the Brooks Act appears increasingly anachronistic in an era of small, low cost, desktop computers, rapidly changing technology, numerous suppliers, easy access to the computer market, the emergence of multi-media technology, and the dawn of the information highway. While the government is the largest single buyer of computers, in the aggregate, private industry now dominates the computer market. Technology has grown by leaps and bounds; computing power is cheap while uniquely developed software now drives costs; and time-share management of computing power is increasingly archaic. Some things have remained the same: agencies still do an unsatisfactory job of buying computer systems.

At the time of the Brooks Act, the federal government was the dominant buyer in the computer market. In 1965, the federal government spent the equivalent of \$4.6 billion in 1994 dollars on computer systems comprising 62 percent of the entire computer industry's revenue for that year.⁸ The federal government's market share has now dropped to 3.5 percent of computer industry revenues. As a result, the enormous leverage that the government had in this market has diminished and computer firms are targeting their new products to the private sector. In fact, many large firms do not sell commercial products to the government because of the vast amount of paperwork and reporting requirements.

Technology has changed dramatically since 1965. One of the standard government computers of the era, the IBM 7090, was a so-called second generation computer which marked the transition from vacuum tube to transistor technology. Microprocessors and integrated circuits were still on the horizon. Once computers were stand alone gigantic calculators (less powerful than a Nintendo entertainment center) and were used by physicists to simulate nuclear explosions and cryptologists to crack communist codes. But developments in the defense field required electronics to become smaller--paving the way for the movement from the vacuum tube to the transistor and the development of the

⁸According to GAO, this figure did not include "amounts for equipment used in unique military applications and certain classified activities of the Department of Defense." Thus, the federal government's share of the 1965 computer market was even greater, possibly as high as 85 percent of the market.

integrated circuit. The computer chip has heralded a new revolution of uses for information and erased the boundaries between what was once defined as the computer, communications, and entertainment industries. The microchip is ubiquitous and is found in automobiles, toys, televisions, cameras, thermostats, and calculators. In fact, with today's merging of telephones, computers, and televisions, as well as, the emergence of microprocessors in many products, it is difficult to define what is classified as ADP and subject to the Brooks Act.

Technology is advancing at a rapid pace, driving down the costs of computing. In the last several years, every dimension of the computer industry has changed several times. For example: product cycles in the industry have been reduced from years to months; costs have been dropping 20 to 40 percent a year, while product performance has been increasing 20 to 40 percent a year; and pricing changes -- in a downward spiral for 10 to 15 years -- are sometimes made daily. The personal computer and mini-computer markets are extremely competitive as companies fight for market share. Distributed computer systems using numerous powerful personal computers linked in networks are replacing centralized computing systems built around larger mainframe computers. With a vast increase in computing capability, the old distinctions between personal computers and the more expensive minicomputers are vanishing, and the mainframe computer market is in steep decline.

The government should be able to take advantage of technological and economic changes when buying computer systems. Unfortunately, it has been much slower than the private sector to recognize this opportunity and is in danger of being left behind. The decentralized and competitive computer industry is clearly more attuned to small buyers than was the old IBM-dominated mainframe computer market. Changes in the computer industry are prompting many agencies to call for corresponding changes in federal computer acquisition policy. It was recognized at the hearings before the enactment of the Brooks Act that the act would need to be periodically revisited and amended to cope with new problems and opportunities. Such a review is presently needed. The challenge to the government is designing a system that can achieve the objectives of the Brooks Act-- effective oversight, competition, and fairness within the constraints of technology that require procurements to be made in less than 18 months.

Finding 6: The current acquisition process is inflexible, bureaucratic, wasteful, and over-regulated.

The Oversight Subcommittee contacted over 50 federal departments, agencies, bureaus, or offices for their input on computer related acquisition problems and potential solutions. Among other questions, each organization was asked to name the major problem in computer procurement and asked to provide a potential solution. Overwhelmingly, the number one response of the various agencies was that acquiring computer resources takes more time than is reasonably necessary. Agencies fear being

unable to buy the newest commercially available equipment because of the time required for bureaucratic reviews. One agency's unofficial description of the federal computer acquisition process is "delivering yesterday's technology tomorrow." Agencies stated that the primary reasons for the slowness of the current process are:

--GSA's process of delegating procurement authority is too complicated or takes too much time.

--The Federal Information Resources Management Regulations are too complex and computer acquisition is overregulated.⁹

--GSA's multiple award schedules lack flexibility and are cumbersome to use.

--An excessive amount of paperwork and justification is necessary to acquire computers, exceeding what an agency goes through to buy a like dollar amount of other types of equipment.

--Too many agency and GSA reviews are conducted.

--The government is open to bad faith or frivolous protests which further delays the buy (see Finding 7).

One unique segment of the computer contracting process which has received a lot of agency criticism is the Delegation of Procurement Authority (DPA) process. Agencies can buy satellites, lasers, and aircraft on their own, but are not trusted to buy computers and must go through GSA to do so. This process is much the same for agencies buying unique systems or personal computers. The GSA Administrator exercises authority, under the Brooks Act, by either directly acquiring computers or granting authority to federal agencies to purchase computers in the marketplace. GSA uses DPA's to selectively delegate to other federal agencies this authority to buy or lease computer systems. An agency must request a delegation for large computer purchases. Typically, GSA reviews and approves the buying agency's acquisition strategy and solicitation documents before granting a delegation. GSA also grants "blanket" delegations which give agencies a dollar limit within which the agencies may buy or lease computer systems without prior GSA approval. Currently, blanket delegations are set at \$2.5 million for most agencies.

⁹The Brooks Act also authorizes GSA to prepare and maintain the Federal Information Resources Management Regulation (FIRMR) which applies to the creation, maintenance and use of federal records and the acquisition, management and use of computer resources by federal agencies. The FIRMR includes agency regulations that implement or supplement it. The FIRMR is used along with the Federal Acquisition Regulations (FAR), which apply to the acquisition of many types of supplies and services. Unless specifically stated otherwise in the FIRMR, the guidance in the FIRMR is in addition to, not in lieu of, the FAR policy and procedures.

Most, but not all, defense computer systems are exempt from the DPA process and the Brooks Act. In 1982, the Act was amended by the "Warner Amendment" to exclude a large class of DOD procurements from the GSA's approval authority. The Warner Amendment exempted DOD procurements of computer systems which are used for intelligence, code-breaking, command and control of military forces, and part of a weapons systems. Computers used by DOD for routine administrative and business applications are not exempt from GSA authority. Defense computer acquisition personnel stated, however, that the Warner Amendment is very narrowly interpreted, so many of the purchases that seem to meet the exemption still must go through GSA to get a delegation.

In theory, delegations allow GSA to focus its acquisition expertise on programs where it is needed most, but all of the troublesome major computer systems described in this report complied with current delegation requirements. GSA and the buying agencies were unable to keep these programs within cost and on schedule. This calls into question the value of the delegation process. Is it merely a data collection exercise, and if so, where and when is the government using the data? And does the cost of collecting this data exceed the benefits?

The delegation process requires between 45 and 90 days. While this may not be long compared to the budgetary and contracting processes, this exercise is of questionable value. In a 10-year systems procurement, this time is merely a hindrance, but for the purchase of time-sensitive commodity computers, three months on top of other delays inherent in the contracting process impacts the government's ability to receive the latest technology in a timely manner.

GSA has little authority and less enforcement ability through the DPA process. Last year, GSA approved 716 delegations totaling almost \$20 billion, and denied 84 with a value of \$1.4 billion. The Minority Staff has, however, been told that, in general, most denials are not for substantive reasons and are eventually resubmitted and approved. In almost all cases, procurements are not stopped--just delayed for filing the wrong form. In fact, under provisions of the Brooks Act, the GSA cannot impair or interfere with individual agency determinations of their computer systems requirements, including the development of specifications for and the selection of the types and configurations of equipment needed. If GSA denies an agency procurement request, the denial is subject to review by OMB. Many computer systems problems initially derive from inadequate requirements definition. If GSA cannot impact on these requirements and system planning, the Brooks Act is irrelevant to successful computer system procurements. There is no correction for agencies that are not doing an adequate job of front-end planning. Without this check, the promise of centralized oversight remains unfulfilled.

Still, the present debate focuses on merely changing delegation levels rather than on questioning the adequacy of the process. After proposing higher blanket delegation levels, the GSA Administrator has been advocating that GSA will "delegate, but not abdicate," implying that GSA will hold back DPA authority based on agency past performance in

buying computer technology. This raises three questions: How will GSA measure past performance? Can GSA perform this function without looking at requirements? And are GSA's personnel qualified to make this determination? Based on past experience, it does not appear GSA is up to this task. In practice, procurements are already decentralized, but agencies will still need to come to GSA to check off their forms. It is a puzzling system. Agencies must ask permission to buy computers from GSA first, but GSA does not really have the power to say no. This may be changing given GSA's recent proposal to "encourage" troubled programs to take a time out and review their program. Encouragement would be supplied by capping delegations at the level of funds already spent--putting a hold on all new contracting action in a program. This type of review process may be helpful to stop programs that are already in trouble, but the delegation process does little in the way of preventing these programs from going awry in the first place.

While the delegation process is not providing for effective oversight, there is reluctance to abolish it. National Performance Review and GSA proposals to increase DPA blanket levels will do nothing to solve this contradiction, except they do hold out the possibility that if the levels are raised high enough the system will wither away. The government's primary focus should be on improving agency computer management while creating effective oversight to help the agencies pursue their goals. Buying agencies of all sizes have a direct interest in ensuring that their computer systems acquisitions are handled in an efficient and effective manner. They should be--the money spent for computer systems comes from their budgets; not from GSA. If agencies continue to make bad purchases, Congress needs to explore what can be done to remove the obstacles that stand in the way of good procurement and provide for effective rather than illusory oversight focusing on agency requirements and planning rather than on complying with bureaucratic reporting standards.

Finding 7: Protests and the threat of protests add further delay and costs to purchasing computer systems.

Computer contractor protests are a growth industry, generating much work for lawyers and bureaucrats, but exacting a heavy toll on the government's ability to acquire desperately needed computer systems in a timely manner. Managing the threat of bid protests is standard operating procedure in federal computer system buys. There are incentives for contractors to lodge protests based on strategic business reasons as it makes rational economic sense to exhaust every possible alternative to win a contract. The costs to the federal government from computer protests include millions of dollars in court and personnel costs and schedule delays. Worse yet, delays cause the government to suffer greater obsolescence of purchased systems or a costly renegotiation with the winning contractor to obtain the latest technology. According to agency officials, in an attempt to avoid possible protests, some agencies may actually compromise legitimate requirements.

In 1984, the Brooks Act was amended by the Competition in Contracting Act of 1984 to give the General Services Board of Contract Appeal (GSBCA) jurisdiction over bid protests. This action also gave the GSBCA discovery authority beyond that available to GAO--the venue for hearing most other non-computer bid protests in the government. This authority allows the original protest issue to be expanded by allowing protestors to go on "fishing" expeditions to identify other areas where the agency may have made a mistake. Given the complexities of procurement law and the ability of protestors to focus vast amounts of legal expertise on finding fault with agency procurements, it is not surprising that many of these efforts are successful. The GSBCA's bid protest jurisdiction was to be a three-year experiment, but this jurisdiction was made permanent in the Paperwork Reduction Act reauthorization in 1986.¹⁰

Agencies raised serious questions about the role of the GSBCA in computer systems procurement. A postage stamp investment can put a multi-million dollar procurement on hold. The primary concerns over the process were added costs and delays to the program. For example, the Army pays almost ten times the cost to defend a protest at GSBCA than for protests lodged with GAO. Protests, according to agency officials, have the effect of stopping innovative and streamlined procurement approaches. In 1991, the Air Force attempted to buy a large number of desktop computers using a streamlined acquisition approach where vendors were encouraged to submit innovative solutions. The goal was to encourage competition using minimum contract language while expediting the award. Prior to protests, the Air Force experiment cut seven months off the process. The buy was, however, bogged down by numerous protests over two years by a number of vendors, some of whom seemed determined to block any award not going to themselves.

One has to question the original premise of the GSBCA protest provision. Why is computer acquisition so different that it requires a separate more comprehensive protest authority than other federal acquisitions? It cannot be technological sophistication, as contractors for projects with technologies of equal or greater sophistication (such as lasers, medical equipment, aircraft, and satellites) take their cases to GAO. And, even if a case can be made for distinctness, is the cost of this unique protest process worth the benefits?

The aggregate costs of protests are significant and derive from court proceedings, delays to the program, the use of outmoded equipment, the need to deal with an incumbent contractor (presumably at a higher cost than the new contractor), and opportunity costs of tying up the agencies procurement personnel preparing for an agency defense against the protest. For example, the Department of Commerce estimated it spent around \$1 million dollars to defend a protest for a recent \$12.3 million procurement. In addition to tying up agency personnel, the government incurs productivity losses based on the delay in receiving much needed equipment. In another example, the Department of Labor estimated

¹⁰DOD acquisitions of computers are subject to protest before the GSBCA if DOD's authority for that acquisition is not one of the classes of computer systems specifically excluded by the Warner Amendment.

that it lost over \$300,000 in productivity gains due to delays by four separate protests. Delays to the program also bring on the use of the inevitable technology refresher clauses which drive up computer costs by forcing the government to buy new technology from a sole source after the protest is completed.

While protests at GSBCA take 60 days or longer to resolve, the greatest delays derive from the threat of protests on the contracting process. Agencies contend that the contracting process is lengthened (even in those contracts not protested) by the need to go to extraordinary lengths to avoid any actions that might draw a protest. Some agencies have even given up buying computers on their own and are contracting this function out to other government organizations. GSA's Federal Computer Acquisition Center (FEDCAC) has taken on the role of guiding the most difficult procurements through to completion, presumably without being protested. But, on the Forest Service's recent \$276 million Project 615 procurement, FEDCAC lost a protest and the program is back to square one. One GSA official has observed that the stress built into procurements to avoid protests is driving contracting officers to leave government service or to position themselves to never again conduct computer procurements.

Merely threatening a protest can be very lucrative for firms, even for those who have no chance of winning a contract. Faced with potential cancellation or delay to the program from legal maneuverings, agencies have been known to pay what is called "Fedmail." In Fedmail, the agency pays the costs firms supposedly had incurred in pursuing a protest in exchange for the firm dropping its protest and participation in the procurement. This allows the award to proceed without challenge. To escape the burdens of the protest process, the federal government is forced into what even the GSBCA has termed as "buying off the protester." There have also been disturbing allegations that winning contractors have been forced to pay off losing contractors to keep them from protesting the award.

While the GSBCA protest process arguably instills discipline and compliance with existing procurement law, regulatory compliance seems more important than results. The bureaucratic process reigns supreme and the costs of compliance may exceed the benefits. When buying time sensitive computer technology, government procurement personnel must be extremely meticulous in the acquisition to ensure that it does not slip up on some legal technicality. Only computer purchasers are held to these exalted standards. Instead of wrapping ourselves in restrictive laws and regulations which are counterproductive to buying systems that are desperately needed in government, perhaps it is time to simplify the process.

What should be the exception has now become the rule, as agencies factor in the inevitable protest time. The expectation of protests are so great that the Army adds four months to computer procurement schedules in anticipation of delays from protest. The Office of Federal Procurement Policy has even endorsed this planning as a way to overcome some of the costs derived from the protest process even though this process will eventually lead to the government negotiating technology refresher clauses with monopoly

contractors. Until the protest process is further reformed, computer procurement will continue to be delayed and taxpayers will continue to pay mounting legal fees and opportunity costs.

Finding 8: The General Services Administration cannot do the job it is mandated to do because of a lack of resources and an emphasis on process.

GSA has a unique role in Federal computer acquisition--it is the one agency designated by the Brooks Act as the federal procurement expert, charged to "coordinate and provide for the economic and efficient purchase, lease, and maintenance of ADP by Federal agencies." The effectiveness of GSA comes into question, given the cost overruns and schedule slippages that have occurred in some of the federal government's largest computer acquisitions. The fiction of centralized control of computer systems acquisition is uncovered by an examination of these troublesome acquisitions. If GSA had real authority, it could have intervened and guided agency acquisitions to successful outcomes. But without the power to control the budget, requirements, and procurement of system acquisitions, GSA is a paper tiger that slows down both good and bad acquisitions, but cannot stop them.

Even if it had the authority, GSA's acquisition experts are often spread too thin, resulting in a watered-down approval process consisting of an after-the-fact checkoff of completed forms and studies. If Congress should decide to continue with a trend in the centralization of computer procurement, GSA should maintain its position under the Brooks Act as the chief agency responsible for computer systems only if it radically changes how it implements this responsibility. GSA's staff is currently overstretched to provide the kind of oversight envisioned in current law.

It is also questionable whether GSA has the expertise to guide computer systems procurement. GSA has been just as inefficient in buying its own computer systems as those in the agencies it oversees. For example, GSA's current management information systems at the Public Building Service are antiquated and, according to GAO, cannot even provide basic data on program costs. GSA is presently on its second attempt to modernize these systems and it is uncertain whether they will succeed. OMB has identified GSA's management of its own computer purchases as a high risk program merits high level attention by Congress and the agency. GAO has called for a reorganization of GSA's computer purchasing organization and greater top-management involvement.

GSA currently oversees other agencies' computer purchases through the Information Resources Management Service (IRMS). IRMS is a 1,100 person organization that writes the computer purchasing policies covering virtually all federal agencies, reviews agencies' procurement requests, conducts agency management reviews, and otherwise trains and advises federal agencies once they conclude they need to buy computer systems. The IRMS conducts on-site reviews of all major agency systems programs. It also provides

training to buying agencies, and works with the buying agencies' in-house computer support organizations to train their personnel. Finally, the IRMS also maintains the multiple-award schedule service which provides government buyers with contracts for commodity computers at negotiated prices.

GAO studied the GSA branches that oversee federal computer expenditures and found them to be understaffed, overworked, and subject to high employee turnover. Analysts in the branch responsible for delegations worked as many as 13 cases at once, affecting many millions of the taxpayers' dollars simultaneously. The staff responsible for management reviews was frequently involved with up to four reviews at one time. GAO concluded that the IRMS needed to reallocate its resources to serve its customers--the agencies--better. Although progress has been made by GSA since GAO's report, significant new resources have not been directed into these branches.

Only 45 people are responsible for the delegations and review processes. This explains why agencies view their dealings with GSA as a bureaucratic ordeal, not because of the quality of the personnel, but because of the workload and the time it takes to process a delegation. Only 30 people are responsible for \$27 billion a year in delegations. With such demands on their time, and multi-million dollar procurements being held up, it is no wonder that this has evolved into a process-driven exercise.

CONCLUSIONS

The failure to spend federal computer funds in an efficient manner should cause Congress to pause before approving any new, large information technology endeavors. Although the National Performance Review (NPR) has focused attention on the need for the government to use information effectively, it is first necessary for management's attitudes towards using and buying technology to change. The NPR has outlined a number of projects--from depositing entitlement checks electronically into the bank accounts of beneficiaries to using information technology to enhance government productivity and efficiency--that government computers should be able to accomplish. While the private sector has employed these technologies successfully, the government is not yet prepared to do so.

The "Information Superhighway" has captivated the imaginations of many in government and industry. The problem with this information vision is simple: a government that cannot effectively modernize its existing systems or efficiently buy new ones cannot lead the American people to a new information "promised land." In fact, government computer systems are so antiquated that the government may not even be able to participate effectively in the information superhighway, let alone take a leadership role in its development. Instead of developing futuristic plans, the federal government should concentrate on the more mundane tasks of solving its accounting and management systems problems and procuring government computers in a cost effective manner. In response to market forces, the private sector is currently building an elaborate and

sophisticated information and communications network. It is questionable whether the government can add efficiency and economic value to this enterprise except through greater deregulation.

Obtaining and keeping qualified personnel to perform federal computer systems procurement is a serious problem. There are many dedicated and capable people in government procurement, but it is difficult to recruit and retain other qualified and experienced program and contracting personnel because the market for computer systems program and procurement professionals is highly competitive. The government does not pay its personnel comparable to what industry pays its program managers, contracting officers, and procurement lawyers. As a consequence, the government is sometimes outgunned by industry in contract negotiations, program management, and in the courts when programs are protested.

The government undertakes its purchasing by tying itself up in a torrent of conflicting regulations and laws designed to achieve goals that have nothing to do with getting the best value for the American people. Policy makers direct program officials to perform impossible tasks within an acquisition system with little tolerance for error. Authority for requirements, budgets, and schedules are diffused. Oversight agencies and the media await to pounce on the first problem. In this environment, there is a real danger that the government will drive away its most experienced people. When considering any changes to the way the government purchases computers one has to focus on not only the system but personnel.

In assessing management failures outlined in this report, there is a temptation to legislate more controls, more regulations, and laws to limit the discretion of program officials. This would be a serious mistake. There will be management failures with or without more controls. We do not want the risk of an occasional failure to lead the government to introduce burdensome controls that will inhibit success.

Perhaps the government can learn from the lessons of the past. The problems inherent with the procurement system have been identified many times throughout the past decades, most often when looking at DOD and NASA acquisitions. A multitude of Presidential Commission reports--the Hoover Commissions of the 1950s, the 1984 Grace Commission, the Packard Commission of 1986, and most recently, the 1993 National Performance Review--hold many insights into improving computer system acquisitions. Unfortunately, however, the federal government is nowhere near implementing the recommendations of past Presidential Commissions.

The solution is fairly straightforward, incredibly difficult to implement, and was expressed by former Deputy Secretary of Defense David Packard nearly a decade ago: get good personnel, give them authority and responsibility to do the job, leave them alone, and hold them accountable for their actions. Once these people are in place, requirements and funding need to remain stable. If the program still fails, responsibility rests on the shoulders of the program manager and he or she should be replaced. If the program is too large it

should be narrowed in scope. Pilot programs should be established to encourage flexibility by waiving procurement rules on a test basis and, if successful, be made permanent. Oversight needs to be focused on areas that will achieve the most benefits for the taxpayer.

The government must focus its best talent on areas which have the potential to achieve the greatest benefit for expenditure of personnel resources--the early phases of program. The Packard Commission's solution to this problem with respect to defense programs was to establish a Joint Requirements Management Board to review requirements and oversee the early phases of every major program to ensure that agency cost estimates and technological assumptions were in line with reality. The idea was to bring together the best acquisition personnel at the beginning--not at a later date when a program is in trouble, as was common practice. A similar board may be needed to review civilian computer procurements, which are the largest acquisitions most civilian agencies will ever make. Based on past experience with bodies designed to provide oversight over federal procurements, there is a real danger that this board may only perform bureaucratic paper-shuffling and little true oversight. Nonetheless, it is imperative to get the most highly qualified acquisition personnel with the necessary authority to impact program development to review programs early in the development process.

RECOMMENDATIONS

Congress should consider the following options to remedy the problems that exist in how the federal government buys computer systems:

1) Emphasize early oversight and planning: Target oversight of computer acquisitions on the early phases of programs to encourage agencies to reevaluate how they do business before spending money on automation.

--Establish an independent technical review committee staffed by members of the acquisition community to review and approve plans and milestones of large computer systems acquisitions over \$100 million in life-cycle costs. Members of this review committee should have hands-on experience with the uncertainties and risk-intensive world of computer systems acquisition. As the executive branch has largely failed in its large systems acquisition responsibilities, Congress will also have to provide stricter and earlier oversight.

--Focus GAO and Inspectors General reviews to a great extent on the early acquisition phases of computer systems development to determine if agencies have an overall strategy for implementing information technology into their operations.

2) Reduce bureaucratic barriers to purchases: Streamline external and internal agency review processes which add months to purchasing time and result in the acquisition of outdated technology.

--Replace the Delegation of Procurement Authority process with an approach that provides for meaningful oversight over early planning for large computer systems buys. Computer systems acquisitions should be overseen from wherever the government can concentrate its computer acquisition expertise--in a reformed GSA, OMB, or a senior management interagency group.

--Consolidate protest venues. The process of buying computers is not so different from other federal purchases to justify the need for a duplicate and unnecessarily burdensome protest venue.

--Where appropriate, employ umbrella contracts with competitive task order strategies to enhance competition and streamline the time it takes to buy computer systems. If the government cannot reduce the time it takes to competitively buy computers before they are obsolete, it should consider alternatives such as leasing, task order contracts, and privatization of federal computer services and operations.

3) Avoid reinventing existing technology: Ensure that developing unique systems is the exception rather than the rule. It should be rare for the government to purchase anything but commercially available hardware and software. The Federal Acquisition Streamlining Act of 1994 includes some useful provisions regarding purchasing commercial items, but unless agencies radically alter their dependence on uniquely developed non-commercial computer systems, this legislation may not have a significant effect on computer purchases.

4) Size projects to manageable levels: The government should address automation in manageable segments by adopting an evolutionary approach to systems acquisition by splitting acquisitions in smaller stand-alone segments. Each subsequent piece should be required to be compatible with its predecessors. If a segment runs into any significant cost or schedule difficulties, it should be immediately canceled.

5) Encourage innovation: Establish pilot programs to try new procurement ideas. As technology changes, what is appropriate in today's buying environment may be obsolete tomorrow. No one has a monopoly on good ideas and the government needs to be flexible incorporating new technology.

6) Create incentives for the government and contractors to perform: Allocate agency information budgets based on past management performance in meeting cost, schedule, and performance goals. While cost should remain a significant factor, the government should select computer contractors as much as possible based on past performance.

7) Communicate lessons learned: Encourage the foundation of interagency advisory working groups to share experience about federal computer systems acquisitions. Industry-government communications should be enhanced during all phases of the acquisition cycle. An on-line data base with agency comments on contractor performance should be established and made available to agencies buying computer systems.

8) Reevaluate existing procurements and halt new procurements until the computer acquisition process is improved. Suspend and review existing large computer system acquisitions to determine if current agency plans for automation will achieve the best value for the taxpayer. Halt new large computer procurements until the government improves the computer acquisition process and can ensure effective planning, cost effectiveness and timely delivery of new systems.

APPENDIX A

PROBLEM ADP PROGRAMS AND ORGANIZATIONS IDENTIFIED BY GAO - 1990-94

Inadequate Requirements Analysis

DOD Corporate Information Management
 Veterans Affairs Information Systems Modernization
 Commerce : Office of Information Resource Management
 National Weather Service: AWIPS program
 EPA Information Resources Management
 Federal Crop Insurance Corporation Acquisition Project
 Forest Service Geographic Information System
 Air Force Reliability and Maintainability Information System
 Air Force Automatic Communications Processor
 Worldwide Military Command and Control System ADP
 Modernization Program
 NORAD Tactical Warning and Attack Assessment System
 Worldwide Command and Control System Information System
 Worldwide Military Command and Control System
 AID Mission Accounting and Control System
 AID Mission Information Decision Assistance System
 AID Information Resources Management Program
 SEC Electronic Data Gathering, Analysis and Retrieval System
 NASA Occupational Health Management Information System
 NASA Payroll/Personnel System
 NASA Standard Agency-wide Accounting System
 NASA Institutional Environmental Management System
 NASA Automated Information Management Program
 FAA Advanced Automation System
 FAA Peripheral Adapter Module Replacement Item
 FAA Initial Sector Suite System
 FAA Tower Control Computer Complex
 FAA Area Control Computer Complex
 FAA Interim Support Program
 FAA Automated Radar Tracking System
 FAA Computer Resources Nucleus Project
 FAA Airman and Aircraft Registry
 FAA Information Resources Management
 FAA Airmen Certification Information System
 FAA Aircraft Registration Information System
 FAA National Airspace System Plan
 FAA Terminal Radar Approach Control System
 FAA Automated Radar Terminal System
 FAA Mode C Intruder
 FAA Common System
 Pension, Benefit Guaranty Corporation Premium Accounting
 System
 Financial Management Service System 90
 Financial Management Service Payments, Claims and
 Enhanced Reconciliation System
 National Institutes of Health: Major Computer Acquisition
 HHS Child Support Enforcement Network
 Western Interstate Clearinghouse Project
 HHS Child Support Enforcement Program
 Navy's Tactical Advanced Computer-4
 Air Force Standard Systems Center
 Air Force Automated Technical Order System
 Air Force Depot Management Maintenance Information System
 Air Force Personnel Concept III System

Air Force Command and Control Segment Program
 NORAD Communications System Segment Replacement
 Program
 NORAD Space Defense Operations Center IV Program
 Air Force Ballistic Early Warning System
 Air Force Space-Based Atmospheric Surveillance System
 Air Force Space-Based Space Surveillance System
 DOD Mission Planning System

Inadequate Cost/Benefit Analysis

Navy's Tactical Advanced Computer-4
 Army Corporate Data Base Project
 Army Training and Doctrine Command Decision Support
 System
 Army Installation Support Modules Project
 Navy Standard Civilian Pay System
 Air Force Personnel Concept III System
 DOD Computer-Aided Acquisition and Logistics Support
 DOD Corporate Information Management
 DOD Composite Health Care System
 Civilian Health and Medical Program of the Uniformed Services
 Veterans Affairs Information Systems Modernization
 Patent and Trademark Office (PTO) Automated Patent System
 PTO Patent Application Management System
 PTO Classified Data System
 PTO Classified Search and Image Retrieval System
 PTO Text Search System
 PTO Patent and Trademark Copy Sales System
 Federal Employees Retirement System
 OPM Federal Employees Retirement System Automated
 Processing System
 Civil Service Retirement System
 Forest Service Geographic Information System
 NASA Occupational Health Management Information System
 NASA Payroll/Personnel System
 NASA Standard Agency-wide Accounting System
 NASA Institutional Environmental Management System
 NASA Automated Information Management Program
 FAA Airmen Certification Information System
 FAA Aircraft Registration Information System
 FAA Computer Resources Nucleus Project
 FAA Mode Select System
 FAA Advanced Automation System
 IRS Tax Modernization System
 Financial Management Service System 90
 Financial Management Service Payments, Claims, and
 Enhanced Reconciliation System
 HHS Child Support Enforcement Network
 Western Interstate Clearinghouse Project
 Health Care Financing Administration Common Working File

Inadequate Information Resources Management

Army Information Resources Management Program
 Army Management and Oversight Improvement
 Army Data Management and Standards Program
 Navy Shipboard Non-Tactical Automated Data Processing Program
 Air Force Depot Maintenance Management Information System
 DOD Corporate Information Management
 Defense Business Operations Fund
 Marine Corps Recruiting Service Management Information System
 Navy Station Information Management System
 Army Recruiting and Accessions Data System
 Air Force Procurement Management Information System II
 Air Force Personnel Concept III System
 Army Integrated Procurement System
 Army Civilian Personnel System
 Army Supercomputer Program
 Navy Stock Point ADP Replacement Project
 Navy Engineering Data Management Information and Control System
 Navy Integrated Disbursing and Accounting Financial Information Processing System
 Naval Aviation Logistics Command Management
 Veterans Benefits Modernization Acquisition
 Veterans Affairs Reorganization of Information Resources Management
 DOE Information Resources Management Program
 Five-Year Information Technology Resources Long-Range Plan
 Commerce: Office of Information Resources Management
 Veterans Benefits Administration Modernization
 AID Mission Accounting and Control System
 AID Mission Information Decision Assistance System
 AID Information Resources Management Program
 Environmental Protection Agency Information Resources Management
 FBI National Crime Information Center Project 2000
 Department of Justice's ADP Management and Operations
 FAA Advanced Automation System
 FAA Computer Resources Nucleus Project
 FAA Airman and Aircraft Registry
 FAA Interim Support Plan
 FAA National Airspace System Plan
 Coast Guard's Information Resources Management
 IRS Automated Underreporter System
 IRS Electronic Filing System
 IRS Tax System Modernization
 National Institutes of Health 1988 Computer Procurement Activity

Inadequate Capacity Planning / Management

Navy's Tactical Advanced Computer-4
 Defense Logistics Agency Automated Information Systems (Main Frame)
 USDA National Finance Center ADP

FAA Information Resources Management
 FAA Voice Switching and Control System
 FAA Terminal Radar Approach Control facilities
 FAA Automated Radar Terminal System
 FAA Mode Select Procurement
 FAA Advanced Automation System
 FAA Computer Resources Nucleus Procurement
 NIH Information Resources Management organization (for 1988 buy)
 HHS Office of Child Support Enforcement Network (telecom)
 HHS Health Care Financing Administration's data center systems

Failure to Consider Alternatives

Navy's Tactical Advanced Computer-4
 Air Force Personnel Concept III system
 Air Force Command and Control Segment Program
 NORAD Communications System Segment Replacement Program
 NORAD Space Defense Operations Center IV Program
 Air Force Ballistic Early Warning System
 Air Force Space-Based Atmospheric Surveillance System
 Air Force Space-Based Space Surveillance System
 DOD Mission Planning System
 DOD's Computer-Aided Acquisition and Logistics Support initiative (more policy than system)
 Tactical Air Forces Workstation Computer System
 DOD Lightweight Computer Unit System
 Army Standard Installation/Division Personnel System III
 Army Strategic Logistics Program
 Air Force Super-High-Frequency Portable Terminal System
 Air Force Ultra-High Frequency Satellite Terminal System
 Defense Logistics Agency Standard Automated Material Management System/Immediate Improvement Initiative
 Forest Service Geographic Information System
 NASA Occupational Health Management Information System
 NASA Payroll/Personnel System
 NASA Standard Agency-wide Accounting System
 NASA Institutional Environmental Management System
 NASA Automated Information Management Program
 FAA Information Resources Management, Agency Wide
 FAA Airman and Aircraft Registry Systems
 FAA Mode Select Procurement
 FAA Advanced Automation System
 FAA Computer Resources Nucleus Procurement
 GSA Automated Data Processing Procurement
 HHS Office of Child Support Enforcement Network

Restricted Competition

Navy's Tactical Advanced Computer-4
 Air Force Standard Systems Center - Phase IV and Standard Base Level contracts
 Tactical Air Forces Workstation Computer System
 DOD Lightweight Computer Unit System
 GSA Automated Data Processing Procurement

Inadequate Implementation Planning

Navy Shipboard Non-Tactical Automated Data Processing Program(S)
 Army Standard Installation/Division Personnel System III
 Army Strategic Logistics Program
 Air Force Super-High-Frequency Portable Terminal System
 Air Force Ultra-High-Frequency Satellite Terminal System
 Defense Logistics Agency Standard Automated Material Management System/Immediate Improvement Initiative
 Veteran's Benefits Administration Computer Systems Modernization
 USDA Federal Crop Insurance Corporation computer acquisitions
 FAA Terminal Radar Approach Control Facilities
 FAA Automated Radar Terminal System (ARTS IIA)
 FAA Computer Resources Nucleus Procurement
 FAA Advanced Automation System
 FAA Mode Select Procurement
 IRS Automated Underreporter System
 IRS Electronic Filing System
 IRS Tax Systems Modernization Program

Inadequate Testing

Army All Source Analysis System
 Naval Aviation Logistics Command Management System
 FAA Advanced Automation System
 FAA Information Resources Management, agency-wide
 FAA Voice Switching and Control System
 FAA Mode Select Procurement
 FAA Computer Resources Nucleus Procurement
 FAA National Airspace System Plan
 IRS Tax Systems Modernization

Lack of Internal Controls

Army Corporate Data Base Project
 Army Training and Doctrine Command Decision System
 Army Installation Support Modules Project
 Navy Tactical Advanced Computer-4
 Naval Aviation Logistics Command Management System
 Air Force Standard Systems Center - Phase IV and Standard Base Level contracts
 Veteran's Affairs Office of Information Resources Management re-organization
 DOE Information Resources Management Program
 DOE Five-Year Information Technology Resources Long Range Plan
 DOC Patent and Trademark Office Automated Patent System
 AID Mission Accounting and Control System
 AID Mission Information Decision Assistance System
 AID Information Resources Management
 EPA District Information Systems
 EPA Information Systems, agency-wide
 FAA Information Resources Management, agency-wide
 FAA Terminal Radar Approach Control Facilities
 FAA Automated Radar Terminal System (ARTS IIA)
 Coast Guard Automated Systems Acquisitions
 Pension Benefit Guarantee Corporation Automated Premium

Accounting System
 IRS Electronic Filing System
 IRS Treasury Multiuser Acquisition Contract
 IRS Integrated Collection System
 NIH Information Resources Management, agency-wide
 NIH National Practitioner Data Bank

Inadequate Contract Management

Navy Tactical Advanced Computer-4
 Air Force Standard Systems Center - Phase IV and Standard Base Level contracts
 Navy and Air Force Multiagency Database Machine Acquisition
 DOC Patent and Trademark Office Automated Patent System
 DOC National Weather Service Advanced Weather Interactive Processing System
 Department of Justice Automated Data Processing, agency-wide
 NASA Johnson Space Center contractor Management
 IRS Automated Data Processing (Vanguard contract)
 IRS Automated Underreporter System
 IRS Electronic Filing System
 IRS Tax System Modernization
 IRS Integrated Collection System
 IRS Treasury Multiuser Acquisition Contract
 NIH National Practitioner Data Bank