Meeting the Federal IT Workforce Challenge

Developed by the CIO Council Education and Training Committee

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Foreword

To accomplish their missions, federal agencies need an effective and efficient information technology (IT) workforce. The Clinger-Cohen Act of 1996, the National Performance Review reports, the Government Performance Results Act, and the United States General Accounting Office (GAO) guides on "best practices" make it clear that federal government agencies must act now to ensure that the government's IT workforce has the knowledge, skills, and abilities in information technology resource management to operate effectively in today's environment. Recognizing this need, one of the objectives set by the Chief Information Officer's (CIO) Council in its FY1999 Strategic Plan is to "identify ways to recruit, retain, and re-skill IT professionals (e.g., technicians and managers)."

The CIO Council's Education and Training Committee needed to fully understand the demographics of the IT workforce, in both the federal and private sectors, to meet this challenge. The committee championed teams to research the national and federal workforces and to gain an understanding of how the IT workforce is recruited, retained, and developed. Not surprisingly, it found a high nationwide demand for IT workers, and a short supply. This comes at a time when the federal government is trying to use technology to support its mission more efficiently and deliver high-quality customer service to the American taxpayer. The need for IT professionals puts the government in direct competition with the private sector for scarce resources. *To compete in this hot skills marketplace, the federal government must take immediate action*. Federal agencies with workforce and training responsibilities such as the Office of Personnel Management (OPM) and the General Services Administration (GSA), are already engaged in activities to help meet the challenge.

In the new millennium, all stages of the human resources life cycle—building, recruiting, and developing IT talent—will be stressed much more so than now as the backbone for building an infrastructure of qualified IT professionals at the federal level. From that perspective, and the perspective of a select group of federal stakeholders, Figure 1, Enriching the Information Management/Information Technology Value Chain, highlights the Committee's recommendations in the context of the "farming" of an IT workforce. Farming the IT workforce begins with the establishment of a continuing workforce planning capability to allow federal managers to understand workforce demographics, both now and in the future. It involves such things as conducting occupational studies, determining job profiles, and using assessment tools. Next comes "plowing the field." This includes reaching out to sources of potential IT workers, establishing IT career academies and skill alliances, and building intern programs to capture the graduating skilled workforce. "Seeding the field" includes online recruiting and marketing, scholarship programs, and pay and occupational restructuring. It also includes granting waiver authority from restrictions on direct hiring and permanent/term appointments that put the federal government at a hiring disadvantage. "Fertilizing the fields" helps the workforce grow. Key recommendations include establishing a CIO University to build executive skills, sharing of best practices in training and recruiting, and exchanging personnel and knowledge between government and industry. To "sustain the growth" of the workforce, the CIO Council must partner with the Office of Personnel Management and other responsible agencies and build on current workforce and training activities to deliver on the recommendations in this report.

The outcome of this IT workforce "value chain" will be the desired "harvest"—*an effective and efficient IT workforce supporting the mission* of each agency. Creating such a stable and renewing atmosphere requires changes on many fronts. They are documented in this report.

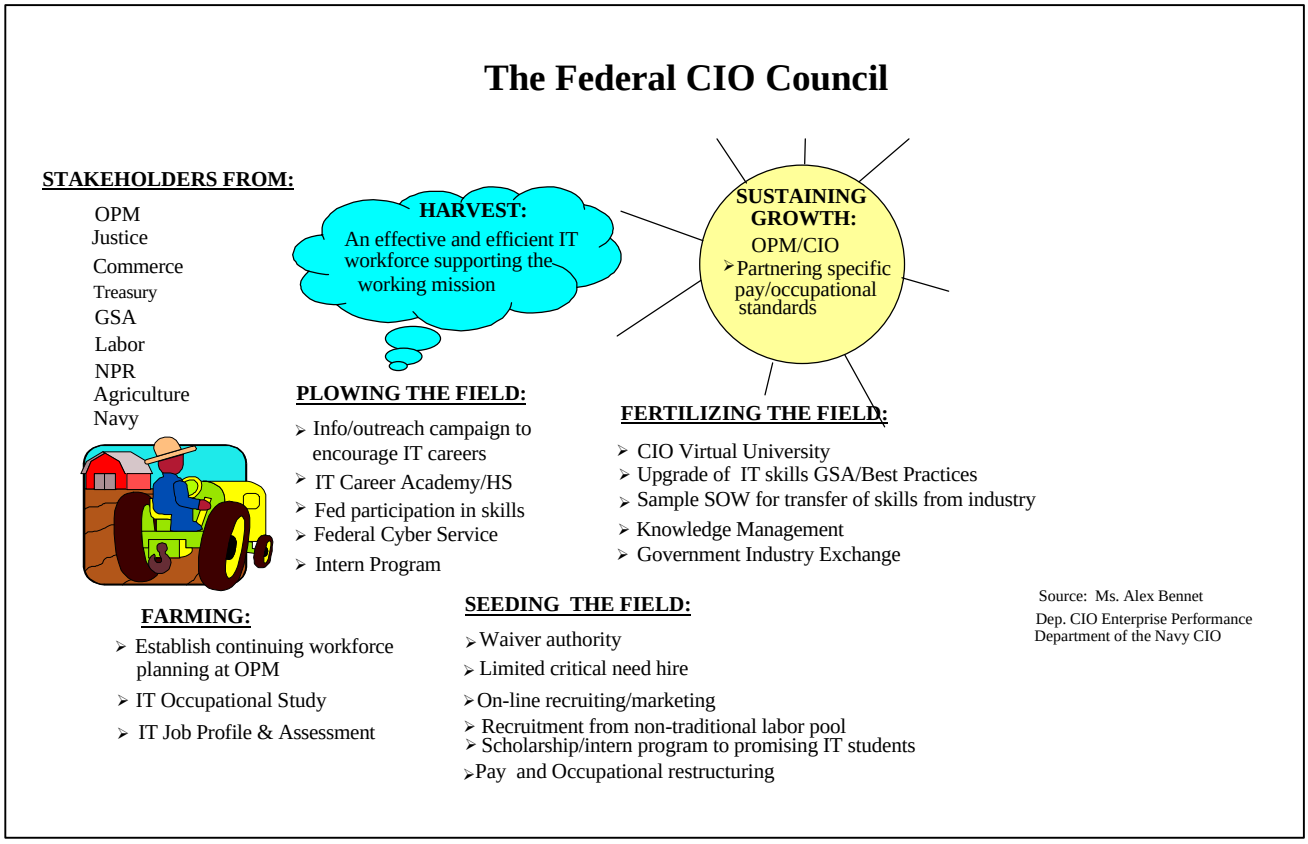

Figure 1. Enriching the Information Management/Information Technology Value Chain

Executive Summary

Because of technology's role in an expanding economy, the demand for highly skilled IT workers is growing at an extraordinary pace. Employers around the country—including the federal government—are struggling to meet their needs for these workers. The tight IT labor market is well documented and reflected in its rising salaries. Also, a serious disparity exists in IT salary levels between the federal government and the private sector.

These issues create serious challenges for federal IT managers. To compete in the IT skills market, the federal government must act now to better manage its existing workforce, improve recruiting and retention, and ensure continued workforce development through investments in training, education, and career-enhancing job assignments.

This report to the Chief Information Officers (CIO) Council, by the Education and Training Committee, documents 13 recommendations to address the complex workforce planning, recruitment, retention, and development challenges of maintaining an effective federal IT workforce.

The Committee's research results and recommendations were originally presented at a Federal IT Workforce Challenge Conference included in the Armed Forces Communications and Electronics Association (AFCEA) Virtual Government Conference on February 25, 1999. Subsequently, 13 recommendations were selected for presentation to the CIO Council. These recommendations were discussed with a select group of stakeholders, including those with direct responsibility in the workforce and training areas, such as OPM, GSA, and the Departments of Labor (DOL) and Commerce (DOC), at an off-site conference on April 5 and 6, 1999.

The recommendations in this report build upon current OPM, GSA, DOL, and DOC activities and provide a blueprint for creating a federal IT workforce that brings innovation and creativity to all federal functions and improves the government's service and responsiveness to its citizens.

Each recommendation includes pertinent background information, a discussion of current activity, and a list of proposed actions. With the CIO Council's approval, a champion will be assigned for each recommendation and a more detailed action plan will be developed. The report also includes additional recommendations from the Federal IT Workforce Challenge focus groups that have merit and should be considered by all CIOs and other agency leadership when developing plans to address the IT workforce challenge.

Recommendations

1. OPM, in conjunction with the CIO Council, should continue the study of IT occupational structure and pay flexibilities. The federal government faces tremendous challenges in employing and paying its civilian IT workforce. Chief among them are disparate pay levels and an inflexible and outdated occupational structure. These issues must be addressed jointly with OPM.

2. OPM should extend beyond Year 2000 a delegated waiver authority to agencies to allow for recruitment and retention of IT professionals. The current retiring workforce—both military and civilian—is a key potential source for IT skills and federal program experience. Tapping this workforce requires OPM to extend its IT waiver authority.

3. The CIO Council should support OPM's efforts to encourge the use of existing hiring flexibilities and the establishment of a critical needs hiring authority. Recruiting has emerged as one of the most pressing IT challenges. Use of hiring flexibilities and a direct hire authority is needed to compete with the private sector.

4. A government-wide IDIQ contract should be established for online recruiting and marketing support. The federal government must take advantage of web advertising to compete for employees with the private sector: this can be accomplished most efficiently and effectively through establishment of a government-wide indefinite delivery, indefinite quantity (IDIQ) contract for online recruiting and marketing support.

5. The CIO Council in conjunction with other federal agencies should take the lead to increase collaboration among federal agencies to upgrade IT skills of the current workforce. This can be accomplished through development of skills road maps, establishment of a training and education database, identification of best practices, and elimination of restrictions on paying for degrees/certification.

6. OPM should encourage federal agencies to recruit from non-traditional labor pools. These include unemployed and underemployed mid-career technical professionals; military technical professionals; women, minorities, and persons with disabilities, as well as part-time workers.

7. Sample statement of work (SOW) language should be created for skills transfer from contractor to government. Skills transfers from private contractors to government employees can greatly improve the quality of the federal workforce. This obligation should be formalized in statements of work for federal IT contracts.

8. The Department of Commerce, the CIO Council, and OPM should jointly conduct an information and outreach campaign to encourage students to pursue IT careers. The federal government should act now to interest more students in computer professions early in their educational careers.

9. The CIO Council, in partnership with key federal agencies and the private sector, should develop an IT career academy and curriculum for adoption by high schools nationwide. Career academies are an important source of talent for several professions and should also be established for Information Technology.

10. A scholarship and internship program should be established for promising IT students in exchange for government service. The federal government will need a substantial number of IT workers in the coming years: scholarship and intern programs should be utilized to help overcome the projected shortage.

11. The CIO Council should encourage federal agencies to participate in regional, sector, and occupational skills alliances. Occupational skills alliances are increasingly being utilized to address IT workforce needs in the private sector and should also be utilized by the federal government.

12. The CIO Council should support a continuing workforce planning capability at OPM. Accurate, specific, and timely information about the federal IT workforce is essential to understand trends and plan accordingly.

13. The CIO Council should continue to support the establishment of a virtual CIO University. A virtual CIO University is needed to provide comprehensive training for federal and industry IT leaders.

Other Recommendations to Consider

The 13 recommendations discussed above are both achievable in the near term and provide the greatest government-wide impact. The following recommendations from Federal IT Workforce Challenge focus groups also merit consideration by CIOs and other agency leadership when developing plans to address the IT workforce challenge.

a) The CIO Council should facilitate a continuous discussion within the federal IT community, IT suppliers, academia, and others to study and analyze workforce trends.

b) IT managers should team with HR and be active in recruiting efforts.

c) Recruit where IT professionals are, on the web.

d) Use flexibilities to balance work/personal life and market flexibilities as a part of total compensation.

e) Advertise in nontraditional publications.

f) Market job openings more competitively.

g) Encourage employees and recognize their needs.

h) Reward outstanding performance when it occurs.

i) Increase and maintain ongoing training investments.

Introduction

This report to the Chief Information Officers (CIO) Council documents 13 recommendations to address the complex workforce planning, recruitment, retention, and development challenges of maintaining an effective federal IT workforce. It culminates work by the Education and Training Committee of the Council in support of the Federal Information Technology (IT) Workforce Challenge initiative, a multi-agency effort to address the growing shortage of IT workers, both in general and within the federal government. The initiative is sponsored by the Education and Training Committee, in collaboration with the General Services Administration (GSA), the Office of Personnel Management (OPM), and a number of other agencies and groups.

The Federal IT Workforce Challenge Initiative Process (Figure 2) began in July 1998 with the identification of three study topics: national and federal strategies, recruitment and retention, and career development. Three cross-agency teams led by federal senior executives conducted research and analysis and developed recommendations.

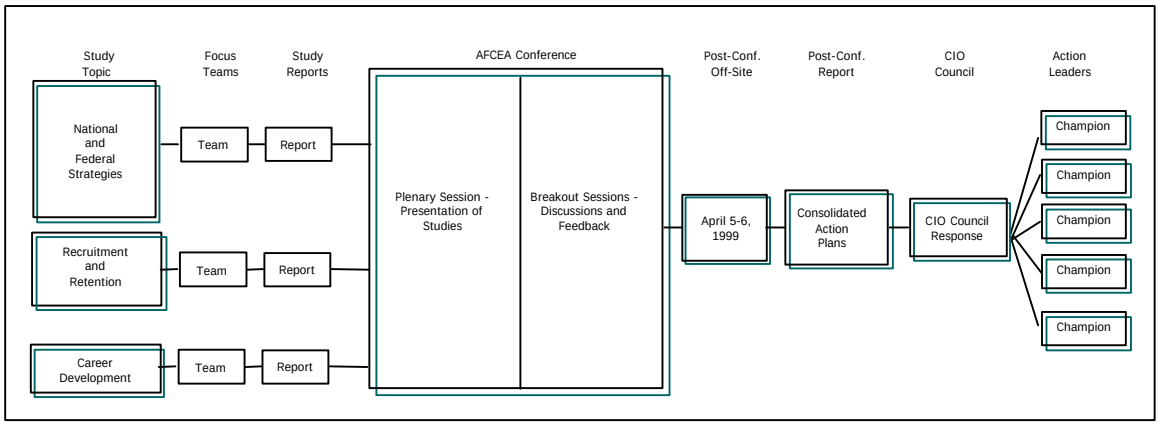

Figure 2. The Federal IT Workforce Challenge Initiative Process

The research results and recommendations were presented at a Federal IT Workforce Challenge Conference included in the Armed Forces Communications and Electronics Association (AFCEA) Virtual Government Conference on February 25, 1999. Experts and interested parties at the conference reviewed the results and recommendations and provided their insights. Subsequently, 13 recommendations were selected for presentation to the CIO Council. These recommendations were discussed with a select group of stakeholders at an off-site conference on April 5 and 6, 1999, including representatives from GSA, OPM, the Departments of Justice, Commerce, Treasury, Labor, Agriculture, and Navy, and the National Performance Review.

Each recommendation includes pertinent background information, a discussion of current activity, and a list of proposed actions. With the CIO Council's approval, a champion will be assigned for each recommendation and a more detailed action plan will be developed. The report also includes additional recommendations from the Federal IT Workforce Challenge

focus groups that have merit and should be considered by all CIOs and other agency leadership when developing plans to address the IT workforce challenge.

Current Situation

These are among the most prosperous times in American history. The nation is experiencing the longest peacetime economic expansion ever, the lowest unemployment level in 42 years, the lowest rate of inflation in 32 years, and the lowest welfare rolls in 29 years. The federal budget is in balance for the first time in 30 years. In the past five years, 18 million new jobs have been created while wages overall have risen at twice the rate of inflation. Much of this economic growth can be attributed to information technology. Accordingly, the demand for highly skilled IT workers is growing at an extraordinary pace, and employers around the country—including the federal government—are struggling to meet their needs for these workers. There is a well-documented shortfall of skilled IT workers.

Between 1987 and 1997, employment growth in three core IT occupations—computer scientists, computer engineers, and systems analysts—rose a remarkable 177 percent, 14 times the rate of growth for the overall economy. This impressive growth is projected to continue well into the next century. Commerce Department analysis indicates that the U.S. economy will need more than 1.3 million new core IT workers—defined as computer scientists, computer engineers, computer programmers, and systems analysts—by the year 2006. (Figure 3).

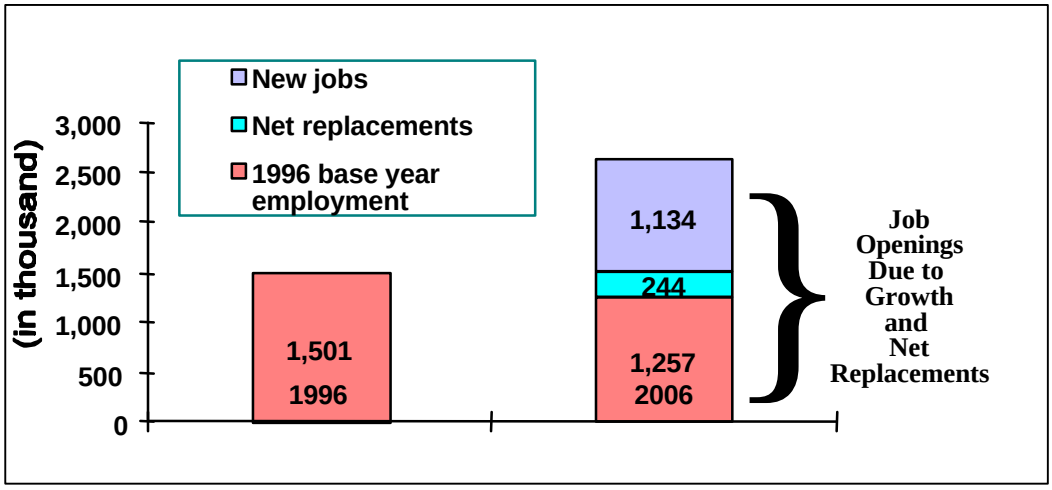

Figure 3. America will need 1.3 million new core IT workers by 2006

Of these, 1.1 million will be needed to fill new jobs and almost a quarter of a million will be needed to replace workers who are exiting these fields. To gain an appreciation for the magnitude of this demand, there were only 1.5 million of these core IT workers in the economy in 1996. This means that over half of the nation's IT workforce in 2006 will have been added since 1996. On average, each year between 1996 and 2006, the nation will need 130,000 new IT workers in these occupations. Within the federal government, the number of IT workers is expected to rise from 66,660 in 1997 to 71,320 by 2006. Achieving this growth will require replacing 32,315 and adding 4,660 new IT workers to the base. (Figure 4).

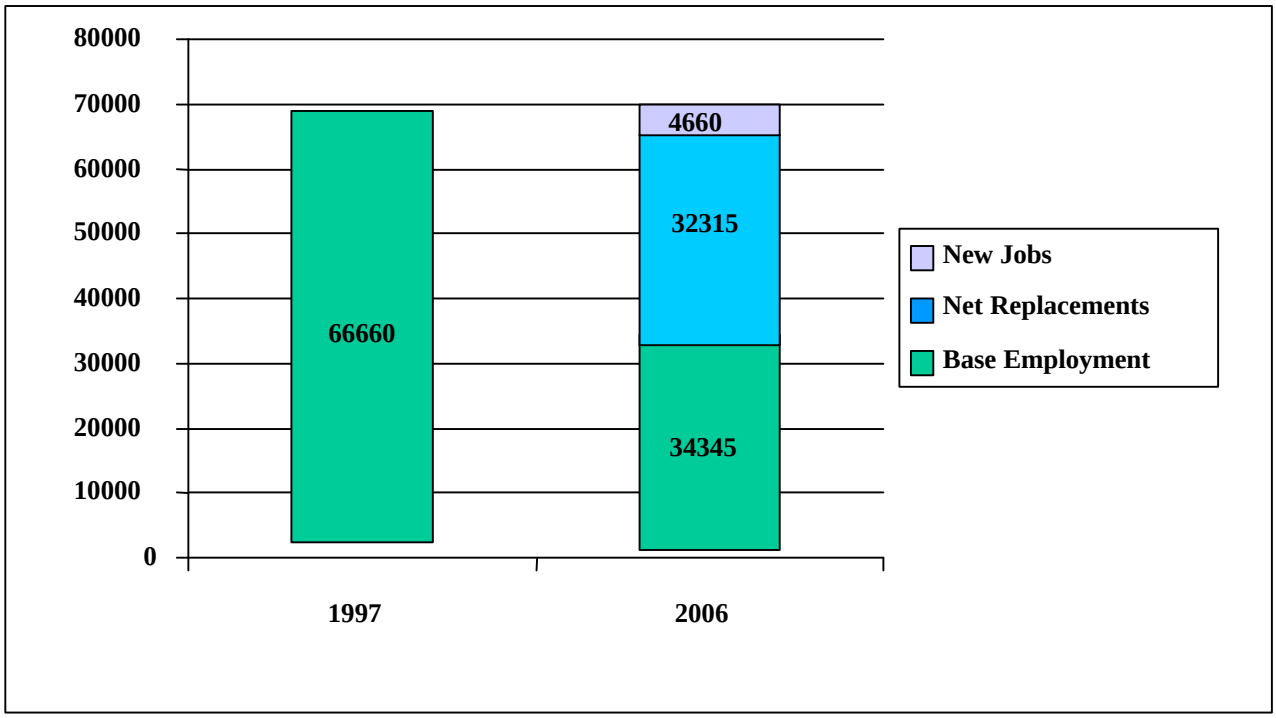

Figure 4. Projected Federal IT Workforce in 2006

At its annual international conference in October 1998, the Society for Information Management (an organization comprised of 2,700 senior executives who are corporate and divisional heads of IT organizations and leading academicians and consultants) issued a position paper entitled "IT Workforce Shortage." More than 80 percent of those surveyed agreed or strongly agreed that the IT workforce deficit is "the most severe in the 50-year history of computing" and that the deficit is "slowing the development and implementation of new systems."

The shortfall of IT workers is reflected in rising salaries. For example, a salary survey forecast by RHI Consulting projects a double-digit jump in starting pay for IT workers in 1999. Starting pay for programmers is expected to increase by more than 18 percent.

Finally, a serious disparity exists in IT salary levels between the federal government and the private sector. The Commerce Department found that starting salaries for computer science graduates with bachelor of science degrees "have nudged up to an average of $36,666" while the federal government's entry level salary for computer professionals ranged from $18,700 to $23,200 for the same time period. The University of Virginia's McIntire School of Commerce reports that for its class of 1998, the average starting salary for those holding the Master of Science in Management Information Systems degree is $50,288.

The situation described above creates serious challenges for federal IT managers. To compete in the IT skills market, the federal government must act now to better manage its existing workforce, improve recruiting and retention, and ensure continued workforce development through investments in training, education, and career-enhancing job assignments. The recommendations that follow provide a blueprint for creating a federal IT workforce that brings innovation and creativity to all federal functions and improves the government's service and responsiveness to its citizens.

Recommendations

Recommendation 1. OPM, in conjunction with the CIO Council, should continue the study of IT occupational structure and pay flexibilities.

Background. The federal government faces tremendous challenges in employing and paying its civilian IT workforce. Chief among them are disparate pay levels and an inflexible and outdated occupational structure. Harris Miller, President of ITAA, emphasized the problem at the February 25, 1999, Federal IT Workforce Challenge conference when he stated that while the federal government was once looked at as a leader in IT, it is now a follower. He also noted that the federal IT sector is facing intense competition from the private sector, with compensation a key discriminator.

The federal government must compete with the private sector which can pay programmers an average entry level salary of $49,000, coupled with bonuses, 401(k) matches, and stock purchases (*Computerworld* 1997 salary survey). A 1999 salary survey forecast by RHI Consulting projects the starting pay for programmers to increase by 18.4 percent. Other IT position increases range from 12.4 percent to 16.3 percent. To compete, the federal government must offer starting salaries at the top step of a GS-09 (currently $43,747) or higher, along with signing bonuses, while also emphasizing other benefits.

In addition, the current occupational structure in the federal government categorizes IT occupations as computer scientists, computer engineers, computer specialists, and telecommunication specialists. These positions do not match the IT occupations recognized in industry today. While IT jobs change rapidly based on advances in technology, the federal IT occupational structure is not easily changed. Broadening the occupational structure of IT work will allow greater flexibility for managers to react to changes in the nature of IT-related work. If the federal government is to compete as an employer, OPM, in partnership with the CIO Council, must take action to change the pay and occupational structure for IT professionals.

Current Activity. OPM has recognized that skill requirements for IT professionals change quickly and must be tracked and updated regularly. It also recognizes that traditional techniques required to attract and retain IT professionals must change. Accordingly, it has undertaken a nationwide study of IT occupations. The primary goals of the study are to:

- Identify the competency requirements of current and future technology occupations.
- Describe the organizational climate and work environment that provide the best support for and are most attractive to technology professionals.
- Identify best practices in recruiting, selecting, training, and retaining IT professionals.

- Research the salary schedule and classification systems of technology occupations to consider for implementation in the federal system.

- Develop a new, more flexible classification standard for the IT job family that will recognize current and evolving specialties, established updated career patterns, and define relationships among IT occupations.

OPM has demonstrated a willingness to work with groups representing special occupations. For example, it is already working with the Chief Financial Officers (CFO) Council to revise qualification standards for accountant positions. OPM developed a draft job family position classification standard for professional and administrative accounting and budget work, GS-0500PA, and a competency-based job profile (qualification standard) for the accounting series, GS-0510. Agencies can use the new profile to implement new or vacant positions filled from outside the agency for a six-month pilot period starting April 2, 1999.

The CIO Council should take advantage of OPM's current activities to help ensure their rapid implementation.

Current initiatives include:	**Milestones**
Integrated IT Occupational Study (OPM)	
- Draft Model	now to mid-1999
- Competency-Based Job Profile Pilot for IT Hiring (participating agencies only)	mid-1999 to 2000
-- Validate Model	
-- IT Competency Assessment Tools	
-- IT Job Family Classification Standard	
- Evaluation of IT Pilot & Nationwide Implementation of Final Plan	2000
New IT Specialty Titles	fall 1999

Proposed actions:	
Continued OPM/CIO Council Study of IT Occupational Structure and Pay Flexibilities	mid-1999 to 2000
Implement new IT Job Family Classification Standard	mid-2000

Recommendation 2. OPM should extend beyond Year 2000 a delegated waiver authority to agencies to allow for recruitment and retention of IT professionals.

Background. The current retiring workforce—both military and civilian—is a key potential source for IT skills and federal program experience. Yet laws restricting dual compensation prohibit retired regular military officers of all uniformed services and all federal civilian retirees from getting the full combined value of their salary and annuity upon reemployment in the federal service. In addition, the law sets a "pay cap" for all military retirees that limits the combined basic pay plus military retired pay to Level V of the Executive Schedule (currently $110,700). Waiving these restrictions will allow the federal government to offer salaries competitive with private industry, retain critical institutional knowledge, and reduce the government's cost for recruiting and training new employees. The law provides OPM the ability to delegate waiver authority on a case-by-case basis "for so long as the authority is necessary due to an emergency involving a direct threat to life and property or other unusual circumstances." OPM delegated a waiver authority to agency heads to support Year 2000 programming needs according to these legal requirements.

Current Activity. OPM can and does approve agency requests for delegation authority for other situations that meet the criteria in 5 CFR 553.202. As daily operations become increasingly dependent on IT, in some situations the loss of key IT staff can result in a potential emergency involving a direct threat to life and property. When an agency's risk assessment program identifies such potential emergency situations, OPM encourages the agency to request a delegated authority waiving the dual compensation reductions for temporary employment of IT professionals to meet all their potential emergency needs. The agency's use of this delegated authority in such emergencies will provide the agency sufficient time to recruit and, if needed, then obtain a non-temporary waiver from OPM under criteria in 5 CFR 553. Accordingly, the Director of OPM has the authority to waive the reduction in a retiree's salary or annuity, on a case-by-case basis at the agency head's request, when an agency encounters exceptional difficulty in recruiting or retaining a qualified candidate for a particular position.

The Department of Agriculture (USDA) took advantage of the Year 2000 waiver authority and requested and received authority from OPM to waive pay and retirement reduction for up to 100 retirees hired to perform Year 2000 work. As of May 1999, a total of 6 waivers had been approved for the USDA's National Finance Center in New Orleans and the National Information Technology Center in Kansas City. USDA was the first federal agency to request use of this waiver authority. Experience shows that this authority was not abused in meeting Year 2000 demands. Similar authority could be used more extensively for all IT professionals.

Also, in November 1998, OPM published a guide for "Recruiting and Retaining Information Technology Professionals." This document describes some of the staffing, compensation, award, and training flexibilities that are available to help agencies attract and retain IT professionals. It can be accessed at the OPM web site (http://www.opm.gov).

Current initiatives include:	**Milestones**
Y2K Assistance to Agencies - Web Site (OPM)	Nov 1998 to 2000
Recruiting and Retaining Information Technology Professionals (OPM Guide)	November 1998
Critical Needs Hiring Authority (OPM/Legislative Initiative)	mid-1999
Proposed actions:	
Finalize Critical Needs Hiring Authority for IT Professionals	mid-1999

Recommendation 3. The CIO Council should support OPM's efforts to encourage the use of existing hiring flexibilities and the establishment of a critical needs hiring authority.

Background. Recruiting is clearly one of the most pressing challenges for federal IT managers. At the recent Federal IT Workforce Challenge Conference, Christopher Miller of the Working Council for CIO's Executive Board noted that the recruiting concern for most CIOs is the "speed-to-seat metric," in other words, the time it takes to attract IT workers and get them started on the job. The industry figure for 1996 was 63 days, while for 1998, it had increased to 73 days. The private sector considers an increase in the "speed-to-seat metric" dangerous primarily because, with the life cycle of projects shrinking, many will be near conclusion before anyone is hired.

The "speed-to-seat metric" presents an even larger problem for the federal government which typically has a longer hiring process and often loses potential hires to private industry. Direct hire authority would allow federal agencies to improve their "speed-to-seat metric" and better compete with private industry, immediately benefiting IT recruiting efforts.

Current Activity. OPM encouraged the use of two of the agency-based flexibilities available for recruiting new employees to meet Year 2000 needs. They are:

- Use of temporary appointments in the competitive service for positions not expected to last longer than one year, but which may be extended for one additional year. Recruitment for these positions is accomplished through the competitive process (5 CFR part 316).

- Use of term appointments in the competitive service when positions are expected to last longer than one year, but not more than four years. Reasons for making term appointments include project work and extraordinary workloads. Recruitment is accomplished through the competitive process (5 CFR part 316).

In addition, OPM is currently developing legislation to allow agencies critical needs hiring authority.

Current initiatives include:	**Milestones**
Y2K assistance to agencies - web site (OPM)	Nov 1998 to 2000
Proposed actions:	
Finalize critical needs direct hire authority for IT occupations	mid-1999

Recommendation 4. A government-wide IDIQ contract should be established for online recruiting and marketing support.

Background. The federal government needs to take advantage of web advertising to compete for employees with the private sector. This can be accomplished most efficiently and effectively through establishment of a government-wide indefinite delivery, indefinite quantity (IDIQ) contract for online recruiting and marketing support.

Private sector companies are already using the web to gain an edge in recruiting. For example, at the Federal IT Workforce Challenge Conference, Computer Associates International reported that it receives about 2,000 resumes a month, or more than 10,000 per year, electronically. These are scanned directly into a database and an automated system keeps track of resumes from all sources—ads, web site, and unsolicited resumes.

Another example is Cisco Systems, which uses a Web Referral Network to encourage new employees to apply to the company. The "Make a Friend" referral program employs sophisticated market research techniques to develop a profile of "good fit" candidates based on a match of the URLs that they visit and those visited by Cisco employees. Good fit candidates are attracted to the Cisco site by targeted banner advertising. A link is provided directly to the Cisco "Make a Friend" program and resume builder pages. A Cisco employee "friend" with a similar background (e.g., same hometown, school, degree, professional interests) serves as a personal recruiter and a mentor for the candidate. Research indicates that this approach works because of a strong correlation between successful recruiting and an effort by the employer to lower the barriers to switching companies for prospective employees. Another key is the importance of catering to prospects by making it easier for them to apply.

Current Activity. Some federal agencies are making effective use of web sites to recruit new employees. For example, the Internal Revenue Service's (IRS) site features the "Digital Daily" which has a picture of Uncle Sam with the phrase "IRS Wants You." The employment opportunity screen allows selection of vacancy announcements, federal salary and benefits information, general employment requirements, and frequently asked questions. Other screens lead to an online application, which were received at a 10-1 ratio over paper applications the first month after being posted.

The IRS's job announcements get even more exposure through the use of "electronic recruiters." Career Mosaic, one of the recruiter sites, is the leading employment site on the web. According to Nielson-I/PRO, an independent auditor, Career Mosaic records more than 5 million visitors per month. It averages 482,000 job searches per day and 53.6 million hits per month.

Another federal government site is OPM's USAJOBS (http://www.usajobs.opm.gov), the U.S. government's official site for jobs and employment information. The site provides information on federal government jobs, has "hot" job lists for various agencies, and offers online applications. Also, OPM's Recruiting Service Model is taking recruiting and retention beyond basic levels, encompassing applicant intake, evaluation, and selection.

While these federal efforts represent a good beginning, they would benefit from enhancements based on private industry models like those identified above. Establishing an indefinite delivery, indefinite quantity (IDIQ) contract to implement web-based recruiting would cut costs for all agencies, give them more timely applications, and allow agencies to contact potential job applicants at sites which they frequent.

Current initiatives include:	**Milestones**
Online recruiting/marketing contract (IRS)	now
USAJOBS (OPM)	now
Professional Recruiting Service Model (OPM)	now
Proposed actions:	
Establish government-wide IDIQ contract to make web advertising available to other agencies	late 1999

Recommendation 5. The CIO Council in conjunction with other federal agencies should take the lead to increase collaboration among federal agencies to upgrade IT skills of the current workforce through:

- Development of skills road maps
- Establishment of a comprehensive training and education database
- Identification and dissemination of best practices
- Elimination of restrictions on paying for degrees/certification.

Background. Constantly changing technology makes frequent ***upgrading of skills*** a way of life for all IT professionals, but especially at the technical level. Consequently, the federal government must make the necessary investments to upgrade skills.

A January 1998 report by the Information Technology Workforce Convocation explains that because the kinds of IT skills required by employers change so quickly, they must expect the following consequences:

- Frequent training will be necessary to meet shifting needs.
- Corporations must reconcile themselves to the financial and organizational commitments implied by continuous shifts in skill requirements.
- Industry, professional organizations, academia, and government should recognize and support the trend toward lifelong learning.

In its report "Help Wanted 1998: A Call for Collaborative Action for the New Millennium," the ITAA notes that 64 percent of survey respondents identified fast-changing technology as the greatest challenge for IT training. It also quoted a 1997 *InformationWeek* survey which found that training was the "number one technique used by IT managers to attract and retain information technology professionals."

Though technology training can be expensive, not training, and therefore losing employees, can be even more expensive. Organized training programs or long-term skill development strategies can significantly reduce turnover. Research has found that well-developed employees are better performers, more loyal to their employers, and more likely to stay in their jobs. Also, a Center for Innovative Technology-Northern Virginia Technology Council study found that companies are paying $2,200 on average for training but that this rises to $3,400 for each new worker they recruit.

Gene Raphaelian, vice president and research director of IT executive programs for the Gartner Group, notes that "training is a big part of the retention issue." Training works because it improves morale [among IS employees] and shows people that their companies will make an investment in them. Consequently, it is not uncommon for businesses to support the formal education of their employees. In response to a February 1998 random sample of all of its print subscribers (reported on June 15, 1998), *InfoWorld* reported that more than three-quarters of respondents indicated that their companies offered tuition or education reimbursement.

ITAA President Harris Miller points out that the federal government, especially, faces several dilemmas with training and development, including slow response to technology change and innovation and difficulty in providing accelerated career path options.

The Clinger-Cohen Act of 1996 cites the need for action to provide the development of a well-trained corps of federal government information resource managers. To support the legislative requirement, in February 1997 the CIO Council developed a framework of "core competencies" —specific task-related areas of knowledge, skill, behavior, or attitude—that agencies could use as a ***road map*** for establishing and evaluating knowledge and skill requirements for agency personnel. Competencies include federal information resource management (IRM), capital planning, and change management, as well as managerial and technical competencies. Road maps for meeting the core competency training needs of all staff, existing and new, will provide building blocks to job performance. Competency-based training makes sense because it identifies the skills needed for a job and invests in improving those skills. By identifying the competencies associated with a particular job and tailoring the training to these competencies, training can be better focused.

While the federal government spends millions of dollars each year on ***education and training***, it does not do so efficiently. Many training segments have a common core requirement, but frequently the training is used only once. Even within the same department, training developed for one component may duplicate training that has already been developed for another component or agency. Such duplication is costly. To facilitate sharing, a single one-stop site that points to sources and other information for education and training is the most practical solution. A collaborative web site on the Internet would save time now used searching the growing number of education and training sites and would become the "portal" site for technology education and training.

One especially noteworthy candidate site is the Department of Labor's (DOL) America's Learning eXchange (ALX) **(http://alx.org)**. ALX is intended to be a virtual learning marketplace, an online superstore for training and education resources. A segment of the site could be the single source for government technology education and training offerings, providers, and best practices, useful to everyone with an interest in technology education. Going one step further, the single responsible authority for education and training initiatives could be identified as an ***Education and Training Best Practices Center***. The Center would identify and disseminate best practices, coordinate all government-wide education and training initiatives, and be the recognized authority on technology education and training in the federal government.

In general, the federal government under-invests in training and does not differentiate in training its IT employees. The Vice President's 1993 Report of the National Performance Review (*From Red Tape to Results: Creating a Government that Works Better and Costs Less*) states: "Leading corporations view training as a strategic resource, an *investment*. Federal managers tend to view it as a cost." It also states: "Compared to the private sector, the federal government invests few dollars and scant time in technology training."

Current regulations governing training of federal employees also pose a barrier to employee development. For example, there are federal restrictions on payment for certifications. This is

inconsistent with normal industry practice, which looks upon the successful attainment of a technical certification as a key indicator to employee knowledge and performance. Certification is a common requirement for technical skill areas in the IT workforce. This ranges from very broad and comprehensive certifications (such as those for the Certified Computer Professional designation) to more product-specific certifications (such as Microsoft Certified Network Engineer). An October 26, 1998, article in *InformationWeek* ("Certification Pays Off") quotes an independent study finding that Microsoft-certified professionals could handle 10 support requests per day per IS staff member versus 7 per day for uncertified employees.

Current Activity. The federal government is taking some action on the areas discussed above. For example, in September 1998, the CIO Council's Education and Training Committee updated its initial list of CIO core competencies. In the fall of 1998, to begin to address the IT skills requirements of the Clinger-Cohen Act, the committee surveyed training initiatives across the federal government that were directed toward maintaining or upgrading IRM skills. Although nearly all agencies had taken some action to establish knowledge and skill requirements, only 16 of 26 had started to assess the extent to which their executive- and management-level staff met IRM knowledge and skill requirements. Even fewer (14) reported plans to rectify deficiencies.

There was consensus among agencies that the knowledge and skill area most in short supply was project management. Accordingly, GSA has initiated the Strategic and Tactical Advocates for Results (STAR) program, with endorsement and initial funding by the CIO Council. The STAR program will advance the Trail Boss professional education program at GSA. While Trail Boss focused on acquiring and managing mission-critical IT systems, STAR aims to broaden its scope to include program and project management across an agency. It includes the financial and business sides of an agency, not just the IT function. According to Emory Miller, Director of IT Professional Development for GSA's office of government-wide policy, "STAR will teach managers from all agency disciplines from experienced GS-13s to members of the Senior Executive Service how to better plan and fund their projects and how to ensure they get a measurable return on their investments."

The CIO Council is also partnering with the Government Information Technology Services Board (GITSB) to identify best practices to ensure a basic level of computer competency for all government employees.

On January 12, 1999, President Clinton issued Executive Order (EO) 13111, "Using Technology to Improve Training Opportunities for Federal Government Employees." The EO established the President's Task Force on Federal Training Technology. Among other things, it tasked the DOL or other appropriate agency as determined by the Task Force, subject to the availability of appropriations, to: (1) establish a specialized database for federal training within the framework of DOL's ALX, or other appropriate information dissemination vehicles determined by the Task Force, to make information about federal training and other learning opportunities widely available to federal employees; (2) establish and maintain a training technology web site for agencies to post training needs and to foster communication among the agencies and between public and private sector organizations to identify and meet common needs; and (3) establish a staffed help desk and technology resources center to facilitate development of online training courses.

These initiatives are a good beginning. However, further development of skills road maps development of a comprehensive database of training opportunities and sources, the establishment of a best practices center, and removal of restrictions on financing of training needs are all required to effectively upgrade the skills of the federal IT workforce.

Current initiatives include:	**Milestones**
Best Practices Benchmarking Survey (Education and Training Committee)	December 1998
Review and revise CIO core competencies on a biennial basis (Education and Training Committee)	September 2000
Partner with ITRB to develop a project management training program for IT and non-IT program managers (Education and Training Committee)	September 1999
Proposed actions:	
Establish a specialized database for federal training within the framework of DOL's ALX (Executive Order 13111, Jan 12, 1999)	now to 2000
Partner with GITSB to identify best practices to ensure a basic level of computer competence for all government employees	now to June 1999
Develop a skills road map	late 1999
Pilot the STAR Program	late 1999
Finalize a comprehensive training and education database	early 2000
Identify and disseminate best practices	late 1999
Eliminate restrictions on degrees/certifications	mid-1999

Recommendation 6. OPM should encourage federal agencies to recruit from non-traditional labor pools:

- Establish an outreach program to attract unemployed and underemployed mid-career technical professionals.
- Establish a bridging program for military technical professionals.
- Recruit women, minorities, and people with disabilities.

Background. To cope with the IT workforce shortage, the federal government must think outside the box and recruit from nontraditional labor pools. These include unemployed and underemployed mid-career technical professionals; military technical professionals; women, minorities, and persons with disabilities, as well as part-time workers.

Mid-career technology workers who may be ***unemployed or underemployed in the private sector*** are a potential source of new recruits. Many workers in this pool may feel disenfranchised in their current job or believe that their current job does not fully utilize their skills, knowledge, and experience. However, they are highly motivated and have a solid skills base which makes them ideal candidates for federal IT career opportunities.

Evidence suggests that characteristics of the private sector market disadvantage mid-career IT workers relative to younger IT professionals. In many cases, private sector IT jobs:

- Demand both knowledge of and experience in the latest, hottest, programming languages.
- Are in a youth-oriented culture that is more in line with a single, non-family lifestyle.
- Require a willingness to work long and odd hours.
- Have a relatively high level of instability and transience.

Conversely, the federal government has needs and a culture that embraces these workers. Generally, federal IT jobs:

- Have defined work hours that are conducive to family life.
- Offer health and retirement benefits that are attractive to mid-career workers.
- Offer stability.
- Often require knowledge of legacy systems and older programming languages.

The federal government has an opportunity to capture the interests of this private sector workforce.

Military technical professionals represent another source. These workers often have high skill levels, years of practical hands-on experience, and training in current technologies. They are familiar with government policies, procedures, and work environments. They tend to like job stability and structured environments. Even candidates that are not fully skilled in IT will most likely have used IT skills in their jobs and may easily be trained in more specific IT skills. These workers represent extraordinary investments by the federal government in terms of education and training, and taxpayers would be better served if they can be retained in federal civilian service.

Women and minority groups are another source. In federal agencies, where women and minorities generally make up a larger percentage of the IT workforce than in the private sector, mentoring programs for these groups can give employers access to a pool of potential talent. A successful example of this approach, while not specifically in IT, comes from the Michigan practice of Deloitte & Touche. As a result of its career planning and mentoring program for women, it has tripled the number of women in key leadership positions since 1993. It is the first of the Big Six firms to have 11 percent of its partners made up of women. Deloitte & Touche also reduced the turnover rate of women by 2.5 percentage points in 1997, resulting in savings of over ten million dollars. This strategy could also work for IT positions.

Upward mobility programs are used to focus attention on the various options employees and supervisors can use for career development. One such program, Avenues for Career Enhancement (ACE), highlights ways for employees to enhance their careers, whether in their current jobs, by moving to new jobs, or by taking advantage of education, training, and counseling opportunities to help them strengthen their credentials. It encourages employees to take on new responsibilities where available and to compete for advertised promotion opportunities. The ACE program also encompasses strategies supervisors and managers can use in supporting career growth, various training and development programs, and the technical information and assistance available through the human resource management organization.

Mid-career non-IT professionals may also be good candidates for a career change. In its study, "America's New Deficit: The Shortage of Information Technology Workers," the Commerce Department reported that some companies have found the practice of retraining existing staff to be sufficient in fulfilling their IT skill requirements. It found that many employees with no prior background and skills in computing are able to learn and apply new information technologies. For example, PricewaterhouseCoopers's (PwC) Step Change program targets CPAs who have consulted with Big Six firms and trains them in a variety of IT roles from business analyst to programmer. According to Fred Fagerstrom, the PwC partner who leads Step Change in the Washington, DC, area, thanks to the program, the company made 300 additional hires worldwide last year, 150 of which were in the United States. Other nontraditional sources include both ***retired IT professionals and retired non-IT professionals*** who may want to return to work in the field of IT.

People with disabilities are yet another underemployed labor market and potential source for IT workers. Tony Coelho, Chairman of the President's Committee on Employment of People with Disabilities, notes that only 26 percent of working age people with severe disabilities are employed, in contrast with the 82 percent employment rate of the general adult population. He added that "the employment figure for individuals with severe disabilities who are also members of racial or ethnic minority groups is even worse!"

IRS participated in a recent recruiting fair sponsored by the President's Committee on Employment of Persons with Disabilities. After months of trying to find candidates for highly technical web development positions, IRS found dozens of qualified applicants, many with advanced degrees, appropriate equipment and software certifications, and outstanding grade point averages. The government is particularly well positioned to direct hire from this labor pool under Schedule A appointments. Many federal agencies, like IRS, also have contracts in place for hardware and software accommodations.

NISH and the National Industries for the Blind (NIB), two quasi-government agencies involved in outreach activities for people with disabilities, are another potential resource for employees with disabilities. Both not-for-profit organizations were established as a result of the Wagner-O'Day Act, which also established a federal market for the purchase of products manufactured by organizations employing people with severe vision disabilities. The Act was amended in 1971 as the Javits-Wagner-O'Day Act to provide for the purchase of both products and services and included federal purchasing for industries servicing people with other significant disabilities.

Finally, ***part-time workers*** are yet another potential labor pool. In fact, part-time staff may actually be more productive than full-time employees. They most likely will give their employer more productive time because of the flexibility that their part-time position provides. Part-time employment is being used successfully in the private sector. It is particularly attractive to women. One company for example specializes in hiring professionals on maternity leave who work at home.

Current Activity. OPM has also begun activity in the recruitment and retention areas. OPM's Professional Recruiting Service Model is taking recruiting and retention beyond basic levels. The model is holistic in its intent and application, and is composed of components that can be used individually or in tandem to maximize recruitment success and employee retention. Components include:

- Workforce planning and market analysis.
- Image building to market the agency and its mission.
- Finding talent.
- Organizational assessment and design.
- Applicant intake, evaluation, and selection.
- Retention.

The CIO Council can endorse and support this OPM effort and encourage building into the model the elements presented here.

Current initiatives include:	**Milestones**
Professional Recruiting Service Model (OPM)	now
Proposed actions:	
Develop program to recruit women, minorities, and people with disabilities	late 1999
Develop bridge program for military technical professionals	late 1999
Develop outreach program	late 1999

Recommendation 7. Sample statement of work (SOW) language should be created for skills transfer from contractor to government.

Background. Skills transfers from private contractors to government employees can greatly improve the quality of the federal workforce. This obligation should be formalized in statements of work for federal IT contracts.

In the past, communications during the acquisition process between government and industry were governed chiefly by restrictions limiting the release of sensitive procurement information and by the need to protect the integrity of the acquisition process. At the beginning of the decade, many individuals both in the public and private sector felt a need for more communication and cooperation between industry and government. The passage of a series of reform initiatives—the Government Performance and Results Act of 1993 (GPRA), the Federal Acquisition Streamlining Act of 1994 (FASA), the Clinger-Cohen Act of 1996, and the Federal Acquisitions Reform Act of 1996 (FARA)—dramatically changed both the focus and the process by which acquisitions are conducted. This change in philosophy shifted the emphasis from the mechanics of the contracting process to the needs of the agency.

This recommendation takes advantage of this new philosophy. At present, most contractors view ensuring that the government acquires specialized skills and abilities as counterproductive: they have little or no incentive to train themselves out of future business. However, the SOW language will make it clear that the contractors are expected to assist the government in acquiring the necessary specialized skills and abilities. The contractor will be reimbursed for its efforts and will thus be more willing to expend the additional time and resources to train government personnel.

A SOW requirement will formalize the obligation and make it part of the contract. For example, a firm specializing in program management that is providing specialized expertise to assist the government should leave the program office at the end of the contract with individuals trained in both the specialized tools and techniques. This should be a part of the basic contractual responsibility.

Current Activity. There is presently no specific activity on this recommendation. Individual agencies may be taking the initiative to afford such knowledge transfer, but it is not a general contracting requirement.

Current initiatives include:	**Milestones**
None	

Proposed actions:	
Develop SOW language for skills transfer from contractor to government	late 1999

Recommendation 8. The Department of Commerce, the CIO Council, and OPM should jointly conduct an information and outreach campaign to encourage students to pursue IT careers.

Background. The federal government should act now to interest more students in computer professions early in their educational careers. By the end of the year 2000, 90 percent of U.S. public schools will be online. By 2002, government-funded, school-based programs will bring the number of children online to 20.2 million. This represents a tremendous opportunity for the government to interest students in information technology careers. Through an information and outreach campaign, the federal government can encourage kids to study the subjects that will enable them to pursue IT careers, especially math and science; make a clear connection between careers and a good income; inspire interest in areas of federal IT careers; and dispel the notion that most IT professionals walk around with a pocket-protector, unkempt hair, white lab coats, high-water pants, and thick-lensed glasses.

This campaign, designed to stir the interest and imagination of young children in the possibilities associated with IT, will expand the future pool of IT workers by eliminating real and perceived barriers to their entry into the IT professions.

Current Activity. The Department of Commerce and OPM each have information and outreach efforts underway to reach the K through 12 student population. Because of the vulnerability of federal government computer systems to cyber attacks and the growing number of agencies that are exploring development of strategic information capabilities, OPM and the Office of Critical Infrastructure Assurance Officer (CIAO) are establishing a Federal Cyber Service program. The Federal Cyber Service will be a group of highly skilled specialists meeting stringent IT certification requirements who will work in some of the most technically demanding and sensitive critical infrastructure positions. During phase one, a special education program for high school students will be developed. In addition, OPM plans to conduct outreach activities such as seminars and promotion programs at high schools, including science and technology academies and magnet schools, to develop prospective candidates. Future activities include development of a university education program and a certificate program.

Current initiatives include:	**Milestones**
Preparation and initial design for Federal Cyber Service components (CIAO/OPM)	now to mid-1999
Proposed actions:	
Federal Cyber Service (CIAO/OPM) - Special Education Program - University Education Program - Certification Program	late 1999 to 2000
Visit Selected Schools	late 1999
Support Science Fairs	late 1999

Recommendation 9. The CIO Council, in partnership with key federal agencies and the private sector, should develop an IT career academy and curriculum for adoption by high schools nationwide.

Background. Career academies are an important source of talent for several professions and should also be established for Information Technology.

The Thomas Edison High School of Philadelphia, Pennsylvania, the first career academy (Electrical Academy), was established in 1969. The first career academy in finance opened in 1982 at John Dewey High School in Brooklyn, New York, with 35 students. It was established by the National Academy Foundation (NAF), a nonprofit 501c(3) educational organization that combines the knowledge and experience of education, business, and government leaders to better prepare public high school students for their futures as college students and members of the workforce.

Over the past decade, NAF has become a powerful force in the school-to-career movement. NAF is the largest career academy program in the nation, operating over 290 academies of finance and of travel and tourism in 33 states and the District of Columbia. With the backing of industry and education leaders, NAF has developed a proven, replicable model of public-private partnerships. The academies encourage young people to stay in school and go on to college. NAF graduates enter two- and four-year colleges at a rate of 90 percent each year. With more than 14,000 graduates already in the field, the NAF program has demonstrated its success with young people of diverse socioeconomic backgrounds.

In Fairfax County, Virginia, Chantilly, Edison, Fairfax, and Marshall High Schools have locally sponsored academies for students interested in pursuing careers in areas such as international studies and business, health and human services, communication, fine and performing arts, engineering and scientific technology. The academies provide Fairfax County students with the professional and technical knowledge and skills necessary for future success, place students with mentors and in internships, and provide other career experience opportunities so that students may make informed career decisions. Students have instructors with industry-recognized credentials and certifications and have the opportunity to use state-of-the-art facilities normally found only at institutions of higher learning.

Using a model similar to those of NAF and Fairfax County, a nationwide curriculum for information technology could be established. The curriculum would be a cohesive, well-defined program that could be implemented in any school district in the country. Government participation in such an initiative would create a strong partnership with business to develop an appropriate curriculum that addresses skills critically needed in both government and industry.

Establishing career academies in high school will focus teenagers on practical coursework that will lead both to higher educational goals and potentially to post-educational career goals. Since academies rely on strong support from the private sector and are geared to providing resources to local communities, they should provide an excellent source of potential workers to meet the IT worker deficit.

Current Activity. The U.S. Department of the Treasury has a Partnership in Education (PIE) program and is currently working with Eastern, Anacostia, and Wilson High Schools in the District of Columbia. In addition, high school curriculum development is already a component of the Federal Cyber Service outreach program being developed by OPM. The federal government should partner with the private sector to establish a high school curriculum and academy program for the IT career field to produce a cohesive, well-defined program, which addresses critically needed skills in government and industry, and help change public attitudes about the IT career field.

Current initiatives include:	**Milestones**
Partnership in Education Program (Treasury)	now to 2000
Preparation and initial design for Federal Cyber Service components (CIAO/OPM)	now to mid - 1999
Proposed actions:	
Develop an IT career academy and curriculum for adoption by high schools nationwide	early 2000
Federal Cyber Service (CIAO/OPM)	late 1999 to 2000
- Special Education Program	

Recommendation 10. A scholarship and internship program should be established for promising IT students in exchange for government service.

Background. As has been discussed before, the federal government will need a substantial number of IT workers in the coming years. Scholarship and intern programs can be utilized to help overcome the projected shortfall. A program for potential IT workers could be created similar to the Department of Defense's Reserve Officer Training Corps (ROTC), which has been an excellent source for the military to develop and acquire highly skilled professionals.

For many high school students with exceptional talent and academic credentials, the high cost of higher education remains a barrier to continued studies. The IT scholarship and intern program would provide the financial means for these students to attain post-secondary education in the IT fields, provide summer jobs, and provide a guaranteed job and work experience for candidates who successfully complete the program. In return, this program would provide federal agencies with a guaranteed crop of talented, experienced young professionals with the latest IT skills who have an obligation to federal service.

Current Activity. A program currently being developed that will employ the scholarship-internship approach is the CIAO/OPM Federal Cyber Service program. As indicated before, the Federal Cyber Service will be a group of highly skilled specialists meeting stringent IT certification requirements who will work in some of the most technically demanding and sensitive critical infrastructure positions. A special education program will be developed for high school students that is tailored to IT occupations.

In this "school for service" program, government will pay for a student's graduate and/or undergraduate education which meets the Federal Cyber Service certificate requirements in return for the student's commitment to government service. Only those candidates who demonstrate high potential for acquiring the Federal Cyber Service competencies through training will be selected. Candidates will receive special technical training and summer internships with federal agencies to work on challenging computer security projects, as well as participate in Federal Cyber Service conferences to encourage continued government service. Federal Cyber Service could be broadened to other IT disciplines and used as a pilot for a larger program.

Similar programs on the drawing board include a Center for IT Excellence that would be used to train candidates close to meeting the Federal Cyber Service certificate requirements in return for a commitment to government service and a program modeled after the White House Fellows Program. This latter program would enlist individuals with exceptional skills to work for federal agencies for at least one year, but not more than two years, on projects of particular significance.

OPM is also creating, through a planned executive order, a Federal Career Intern Program for positions at the GS-5, 7, and 9 levels. Finally, the OPM has expanded the Presidential Management Intern Program (PMI) to include IT. The Presidential Management Intern Program was established by Executive Order in 1977. It is designed to attract to the federal service outstanding individuals from a wide variety of academic disciplines who have an interest in, and commitment to, a career in the analysis and management of public policies and programs. Individuals eligible for nomination to the program are graduate students from a variety of

academic disciplines completing or expecting to complete a masters or doctoral-level degree from an accredited college or university during the current academic year. PMIs receive an initial two-year appointment. The program emphasizes career development. OPM facilitates and provides a structured orientation session and graduation ceremony.

Current initiatives include:	**Milestones**
Career Intern Program (OPM)	now to mid-1999
Preparation and initial design for Federal Cyber Service components (CIAO/OPM)	now to mid-1999
PMI Program expanded to include IT (OPM)	now to 2000
Proposed actions:	
Federal Cyber Service (CIAO/OPM) - Special Education Program - University Education Program - Certification Program	late 1999 to 2000
Establish a scholarship and internship program	early 2000

Recommendation 11. The CIO Council should encourage federal agencies to participate in regional, sector, and occupational skills alliances.

Background. Occupational skills alliances are increasingly being utilized to address IT workforce needs in the private sector and should also be utilized by the federal government.

Booz-Allen and Hamilton consultants John R. Harbison and Peter Pekar, Jr., authors of "Smart Alliances: A Practical Guide to Repeatable Success," pose the question: "Why are more companies seeking alliances to remain competitive?" The answer: "…an increasing number of global enterprises recognize that strategic alliances can provide growth at a fraction of the cost of going it alone. In addition to sharing risks and investment, a well-structured, well-managed approach to alliance formation can support other goals, such as efficiency and productivity. Alliances provide a way for organizations to leverage resources. In the past two years alone, more than 20,000 alliances have been formed worldwide—and strikingly, more than half of them are between competitors."

An example of one alliance is the Rensselaer Learning Institute's Training Network. Companies including IBM, Sybase, PwC, and others have consolidated their buying power in a dedicated training broker who built an enormous training network. Rensselaer selects the vendor, negotiates price concessions, monitors vendor performance, and centrally manages training vendor relationships. The corporate partners receive most favored pricing in exchange for large up-front volume commitments.

Private companies are also forming partnerships with schools. A Department of Commerce study points out, "Many companies, driven by the need to ensure a talent pool from which to draw in the future, have formed strategic partnerships with the schools to improve science and mathematics education at the K through 12 levels. Some companies are offering their own in-house expertise and resources to help teachers and students sharpen such skills."

Current Activity. The President's Executive Order 13111, "Using Technology to Improve Training Opportunities for Federal Government Employees," January 12, 1999, calls on the President's Task Force on Federal Training Technology to form partnerships among key federal agencies, state and local governments, businesses, universities, and other appropriate entities to promote the development and use of high-quality training opportunities.

Current initiatives include:	**Milestones**
Form partnerships among key federal agencies, state and local governments, businesses, universities, and other appropriate entities to promote the development and use of high-quality training opportunities (Executive Order 13111, Jan 12, 1999)	now to 2000
Proposed actions:	
Develop plan for federal agencies to participate in occupational skills alliances	late 1999

Recommendation 12. The CIO Council should support a continuing workforce planning capability at OPM.

Background. Accurate, specific, and timely information about the federal IT workforce is essential to understand trends and plan accordingly. Statistics provided by the Bureau of Labor Statistics and private sector analyses broadly cover the federal IT workforce, but are not specific enough to be useful in workforce planning. Current federal occupational structure and central databases make it difficult to measure trends in the federal IT workforce. Accordingly, solid data are not available to project specific skills shortfalls. This makes it difficult to prepare in advance for such deficits. An established and regularly updated database, along with the capability to monitor the state of the federal IT workforce, will allow the federal government to project supply-demand differentials and better prepare for specific skill shortfalls.

Current Activity. Workforce planning is a systematic approach to maximizing the "people talents" at the heart of human resource management. OPM's Employment Service is developing a model for workforce planning that will provide a vast array of staff planning, management, recruiting, and retention tactics, tools, and techniques for analyzing workforce trends, determining staffing needs, identifying methods to address needs, and developing a clear action strategy for satisfying the needs. Properly done, workforce planning provides seamless transitions through succession, growth, reductions, shifts in skills needs, and workload fluctuations. Agencies can develop "people talent" strategies that play a key role in building a high performance organization.

The workforce planning model will provide resources regarding staffing trends, staff building, managing emerging employee trends, recruiting and retention, strategies for successful succession planning, pay and benefits options, competencies, and more. Again, the CIO Council needs to partner with OPM to ensure that the workforce planning capability developed meets the Council's needs.

Current initiatives include:	**Milestones**
Workforce Planning Model (OPM)	now to mid-1999
Proposed actions:	
Establish workforce planning capability	mid-1999 to 2000

Recommendation 13. The CIO Council should continue to support the establishment of a virtual CIO University.

Background. A virtual CIO University is needed to provide comprehensive training for federal and industry IT leaders. The CIO Council has already endorsed the concept of a virtual university consisting of institutions of higher learning offering curricula based on the established federal CIO core competencies and geared to those in government and industry holding and aspiring to the highest management positions. The CIO University, which exemplifies the cross-agency servicing concept, will deliver a comprehensive program tailored for today's government leadership. The university will deliver a flexible and comprehensive program of core competency modules. Students will elect modules consistent with their development needs. The university will require an arrangement in which study and class time are shared between the student and the employer. Classes will be attended by comparably ranked government and industry representatives, and the participating universities will feature industry leaders in classroom forums.

Current Activity. The federal CIO Council recently approved an updated version of the federal CIO core competencies and hired a contractor to help develop the associated behavioral learning objectives. The objectives formed the basis for a solicitation to the academic community. The competencies and their associated objectives will be the government's requirements for the CIO University. Universities that traditionally serve the federal marketplace were asked to respond to the solicitation with new or existing offerings. The proposed offerings will be evaluated based on their relevance to a very busy federal executive workforce. One or more institutions will be selected to pilot proposed offerings. Offerings may address the complete set of core competencies or one or more modules. The government will fund the enrollment of federal officials, which will make up approximately one-half of a class of 24 students. Other pilots will be launched over time as demand warrants.

Current initiatives include:	**Milestones**
Determination of competencies and learning objectives	Completed
RFI for comment (GSA)	Completed
Proposals due (GSA)	Completed
Selection of participating universities (CIO Council)	Completed
Proposed actions:	
Initiate and evaluate pilots for CIO University (GSA)	Oct 1999 to Oct 2001
Establish CIO University (GSA)	2001

Other Recommendations to Consider

The 13 recommendations discussed above both are achievable in the near term and provide the greatest government-wide impact. As indicated earlier, they were shared with a broad audience at the Federal IT Workforce Challenge conference and later with a select group of stakeholders who endorsed them. The additional recommendations discussed below were also shared at the Federal IT Workforce Challenge conference: they too merit consideration by CIOs and other agency leadership when developing plans to address the IT workforce challenge.

a) ***The CIO Council should facilitate a continuous discussion within the federal IT community, IT suppliers, academia, and others to study and analyze workforce trends.***

The CIO Council would benefit from continuous discussions within the federal IT community, with IT suppliers, and with academia. In fact, the National Research Council suggests greater interaction between industry and universities, colleges, and vocational schools on matters of curriculum. The exposure of students and, in particular, teachers to real-world problems and working conditions would also be helpful. A National Information Technology Workforce Convocation report indicates that, "most educators focus on teaching how to think and apply concepts, while most employers focus on acquisition and application of specific, job-related skills," thus each could benefit from the dialogue. In addition, the CIO Council would gain by learning where the IT suppliers see the skill demand and what academic institutions see as the supply of skills being graduated.

A continuing discussion within the federal IT community would allow sharing of best practices and experience in implementing requirements such as the IRM skills portion of the Clinger-Cohen Act and the President's Executive Order 13111, which reinforces and encourages sharing of training mechanisms for common training requirements across government agencies.

b) ***IT managers should team with HR and be active in recruiting efforts.***

With IT managers and human resources managers working in partnership, agencies will be better able to plan, implement, and fine-tune a package that is the most advantageous for both management and employees. Managers are in a better position than human resources officials to determine which flexibility programs best meet the needs of their employees. Using employee input, managers can ascertain which programs complement productivity without creating an additional strain on already scarce resources.

To reinforce the HR-manager relationship, the Treasury Department's planned manager's guide on flexibilities (benefits, work hours, etc.), points out that it is crucial for managers and human resources staff to work cooperatively in planning the use of and making decisions about flexibilities. In doing so, they must consider particular organizational cultures and needs, equity issues, and the policy and procedural frameworks under which the agency operates.

c) ***Recruit where IT professionals are, on the web.***

Agencies should recruit IT professionals on the web. Approaches already in use by several federal agencies have proven cost-effective, simplified the hiring process, and have reduced the time it takes to advertise job openings and to find potential job candidates on the Internet. This recruiting approach saves time and money and allows employers to reach out to a much broader audience. The approach is particularly useful in hiring IT professionals, who are more likely to search for employment opportunities online. Some online options for recruitment include:

- Advertising job openings on agency website.
- Job posting web sites.
- Image advertising on technical web sites.
- Advertising in online publications and newspapers.
- Targeting online communities, web sites reflecting local interests in geographic areas with high concentrations of technical professionals.
- Resume databases.
- Advertising job fairs.

As job seekers increasingly turn to the Internet, an agency's web site that prominently features the benefits of working for the federal government may influence a decision to choose a job with a better benefits package over a heftier salary being offered in the private sector. However, according to a report by the National Academy of Public Administration (NAPA) which viewed the web sites of 20 randomly selected federal agencies, none of the agencies included their work/life programs on the first page. In many cases, agency employment information was located very deep within the site or was so bureaucratic as to be unintelligible. "This is a major problem when young people say the most unappealing aspect of government work is that it is 'too bureaucratic,' " the report explains.

d) ***Use flexibilities to balance work/personal life and market flexibilities as a part of total compensation.***

Programs that help employees balance work and non-work activities, including alternative work schedules, wellness programs, caregiver assistance programs, and telecommuting, can help improve productivity, retain workers, and reduce costs. Such flexibilities, according to a study by NAPA entitled "Work/Life Programs: Helping Managers, Helping Employees," also increase the "attractiveness" of an employer in a competitive marketplace.

According to the NAPA study, implementing work/life programs may have a positive effect on today's federal workforce at a time when budgets and compensation laws and regulations may not permit an agency to offer competitive salaries. The study cites a survey of high-tech workers at IBM which found that IBM's top performers regard work/life programs as "more important than any other employment consideration, including compensation and salary." A sample of statements from corporate executives clearly establishes that these programs are no longer a "fringe" benefit, but a major contributor to organizational success. The alternative work

schedule is the most sought-after work/life program among those looking for employment, NAPA contends. A major advantage is that it costs little, if anything, to institute. Telecommuting is another low-cost program agencies can offer to help them compete with other employers.

Companies with the lowest turnover rates, according to Blessing/White, a training and HR consulting firm, devote time and effort to creating appealing work environments, while flexible schedules and casual dress codes go a long way toward improving the environment for technical people. Promoting flexibilities on the web is an effective way to assist both employers and employees.

e) ***Advertise in nontraditional publications.***

"Running newspaper ads is rarely effective," Peter Fabris points out in *CIO Magazine*, January 1, 1998, "to attract top-notch talent, companies must go beyond the boundaries of anything they've done before."

IT professionals use computers; that is how they get their information. They are not likely to look for a job on an agency's basement bulletin board. They are more likely to be at Blockbusters renting a movie or reading *IT Recruiter* magazine. One private sector company advertises in movie theaters. Publications related to sports or hobbies may be a better place to advertise. To lure the retired, agencies might try the American Association of Retired Persons (AARP) magazine *Modern Maturity*.

f) ***Market job openings more competitively.***

Federal job vacancies need to be marketed in places that will make them more competitive with the private sector. In addition, they need to be easy to apply for like private sector vacancies. More use of the Internet is needed. Private sector web sites almost always have a "job opportunities" link.

As mentioned earlier, Cisco Systems encourages applicants through a Web Referral Network program called "Make a Friend," using sophisticated market research techniques to develop a profile of "good fit" candidates based on a match of the URLs that they visit and those visited by Cisco employees. Good fit candidates are attracted to the Cisco site by targeted banner advertising. A direct link is provided and a Cisco "friend" calls a candidate at home for an informal conversation. This approach is successful both because of good matching and making it easy for candidates to apply. Adopting such techniques would begin to make the federal government more competitive with the private sector.

g) ***Encourage your employees and recognize their needs.***

Talented people need recognition, training and development, meaningful work, and manager/peer relationships.

A study by McKinsey and Co. shows that over the past decade, talent has become more important than capital, strategy, or research and development. Talented people, in the right kind of work culture, have better ideas, execute those ideas better, and develop other people better. Companies that are complacent about talent, that fail to provide opportunities for advancement, that lack challenging work, and that do not reward employees have the most to lose and are most at risk, the study says. Larger organizations, like the federal government, are so highly decentralized that they don't know how many of these talented people they are losing.

Participants in a focus group targeting USDA workers revealed that they valued recognition, equality, and effective management as a form of agency support for IT workers. All were seeking appreciation and recognition from their managers. They expressed a desire for strong, solid management to support IT initiatives and help provide a structure that clearly maps out opportunities for advancement and purpose.

As noted earlier, because technology is constantly changing, frequent upgrading of skills is a way of life for IT professionals. Successful organizations do not think of training and development as an expense, but as a necessary investment in high performance.

In an article for *Fast Company*, former Secretary of Labor Robert Reich states that, "mutual commitment builds continuity. When it comes to attracting, keeping, and making teams out of talented people, money alone won't do it. Talented people want to be part of something that they can believe in, something that confers meaning on their work and on their lives, something that involves a mission." The biggest challenge for leaders is "finding, attracting, and keeping talented people," Reich says. "Ask talented people what their biggest career challenge is, and you'll hear the same refrain: *Finding good people to work with, and to work for."*

Old management practices put employers and employees on opposite sides of the table, Reich continues. "The model for the organization of the future aims to create tangible and intangible value that both sides can share and enjoy." "The job of leadership today is not just to make money," adds Xerox PARC's John Seely Brown in the same article, "it's to make meaning."

According to Peter Alexander of the consulting firm of Blessing/White, "technical professionals would rather manage themselves and control the conditions, pace, and content of their work. They desire new leadership behaviors in their managers. They want managers who are adept at communicating the goals of the business and the changing needs of customers, and who assign "challenging chunks of work" instead of "boring micro-divisions of work" that underutilize their skills. These are managers who coach instead of giving orders, delegate instead of doing the work themselves, and freely share information instead of operating on a "need to know" basis, the firm explains. They run interference for their people, get support for their ideas from upper management, and protect fragile new ideas from being nipped in the bud."

h) ***Reward outstanding performance when it occurs.***

The way an organization's employees perform determines how or if the organization accomplishes its mission. Employee performance is key to organizational success. Rewarding that performance when it occurs is a way of giving immediate recognition to outstanding performance. A good example of a responsive awards program is GSA's Fast Track Program.

Fast Track Awards are designed to be "immediate" awards, which are extremely easy to give, with virtually no paperwork. Awards are given in specific *net* dollar amounts up to $2,500. Secondary managerial approval is not necessary. The award submission is made over the Internet and the check is sent to the manager via Federal Express within a day.

Another example is USDA's spot award program. The spot awards allow a supervisor to grant immediate monetary recognition for one-time contributions (e.g., special projects, task forces, etc.) to the department or agency mission or goals. The monetary awards range from $50 to $500 and can be paid almost immediately by check to employees. The awards only require the completion of a citation on a special form.

i) ***Increase and maintain ongoing training investments.***

Developing technical staff requires adequate funding and commitment. As referenced earlier, in its report "Help Wanted 1998: A Call for Collaborative Action for the New Millennium," ITAA notes that 64 percent of its survey respondents identified fast-changing technology as the greatest challenge for IT training. Another reminder is the 1997 *InformationWeek* survey that stated that training was the "number one technique used by IT managers to attract and retain information technology professionals."

The OMB should establish guidelines and targets to encourage agencies to invest more heavily in the development of their technical staff. Such targets could have as their goal a three-year program to bring annual skills investment in IT staff from one percent of IT staff payroll to three percent of IT staff payroll on a nationwide basis. OMB would review IT budgets to ensure that these increased investments are being made and that they are directed at specific improvements in agency IT performance.

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