



WORKFORCE & HUMAN CAPITAL FOR IT COMMITTEE

UPDATE 2002

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“...good software processes and good technology are important ingredients for success; but the most important ingredient of all is the people.”

-- Edward Yourdon, software engineer and author of 25 computer books.¹

EXECUTIVE SUMMARY

Introduction

For the past several years, the Federal Chief Information Officers (CIO) Council’s Workforce and Human Capital for Information Technology (IT) Committee has addressed the Federal Government’s ongoing demand for highly skilled IT workers. The Committee is the Government’s key advocate for strategies to recruit, develop and maintain an effective Federal IT workforce. The Committee’s broad agenda encompasses the full employment life cycle: workforce planning, recruitment and retention, and career development.

As the Council’s committee structure was reformed with the advent of E-Government initiatives, the Committee’s importance has not only been sustained, but also increased. In a December 16, 2002, memorandum to CIOs, Council Vice-Chair Karen Evans confirmed this, stating that as the Council engages in corporate management of IT resources, with a Government-wide enterprise approach to projects, it must also ensure that the IT workforce is well-versed in project management and trained to execute such projects with minimum risk.

The Council’s immediate focus is on today’s critical workforce needs: project managers, solution architects, and security specialists. However, the potential for severe shortages across the spectrum of IT competencies looms in the future as a result of an aging workforce, limited recruitment at entry levels, and the eventual resurgence of the U.S. economy. Today’s low turnover rates and plentitude of applicants may be deceptive. The crisis is merely postponed, not averted. This temporary relief from an IT workforce crisis is a window of opportunity. It provides time to put into place practices that will enable CIOs not only to prevent chronic skill gaps, but also to create the highly skilled workforce needed in the future.

Update 2002

This report, commissioned by the Committee in the fall of 2002, is intended to describe not just the actions the committee has taken, but also their impact. Over the past three-plus years, the Workforce Committee has implemented most of the recommendations in its June 1999 report, “Meeting the Federal IT Workforce Challenge.” This update

¹ Edward Yourdon, *Death March: A Complete Software Developer’s Guide to Surviving “Mission Impossible” Projects*, (Upper Saddle River: Prentice Hall PTR, 1999), p. 124

includes reviews and analyses of the key areas covered by the 1999 report: Workforce Planning and Management; Recruitment and Retention; and Career Development.

Specifically, it provides updates on various Committee initiatives including the new position classification standard for IT, special salary rates, the Virtual Job Fair, and those initiatives that target tomorrow's workforce through the High School Outreach Team for Information Technology (HOT-IT) and the National Academy Foundation's IT Career Academy Programs, and others like CIO University and the Roadmap project that are geared towards facilitating a culture of continuous learning.

Accomplishments

While the specific achievements and results of each IT workforce initiative are described in some detail in the sections that follow, it is useful to summarize the major benefits of the Committee's work over the past four years. The list below highlights accomplishments and impacts reflecting the efforts of many people associated with the Committee and the institutions, such as OPM, the National Academy of Public Administration (NAPA), the Information Technology Association of America (ITAA), and the Industry Advisory Council (IAC), with which it has collaborated.

Workforce Planning and Management

- While previously IT jobs were classified primarily through the outdated, inflexible GS-334 standard, there are now ten specialty titles within the new 2210 IT management series. More than 70% of the IT workforce has been converted to the new series.
- Work is underway, and the product is nearing completion, to recognize the importance of project management skills via the OPM guide covering this critical function. This work provides a strong foundation for the Council's emerging role in assuring competent project management for enterprise-level initiatives.
- By sponsoring the National Academy of Public Administration study, and endorsing and publicizing the Academy report, the Council has increased awareness of the workforce and compensation issues and laid the groundwork for legislation that could provide, across Government, the flexibilities now available only to selected agencies.
- The Committee has provided, and will continue to provide a forum for discussion of IT workforce issues and strong leadership toward long-term solutions.

Recruitment and Retention

- In part due to the IT Workforce Committee's close collaboration with OPM to study pay disparities for IT workers, special salary rates were established in

January 2001 for entry-level and developmental-level Federal IT workers with the latest skills.

- In the past, a slow, cumbersome staffing process was the norm. The Virtual Job Fair demonstrated that it is possible, within the current rules, to hire competent IT workers quickly. Whereas before offers were made within months, the job fair demonstrated how offers can be made within weeks.
- Through its relationship with the Critical Infrastructure Protection Board, and by assuring placement of graduates of the scholarship-for-service program, the Council is helping to build capacity in the cyber-security field.
- Previously, both student loan repayments and paying for professional certification were prohibited, and now they are both permitted.
- In part due to the Council's work, outreach to high school students is increasing, and has the potential to increase the pipeline of IT workers for the future.

Career Development

- CIO University graduates are gaining and using needed competencies and enhancing their career advancement opportunities, through curricula based on the Council's Clinger-Cohen competencies, all at very little cost to the Government.
- STAR program graduates are gaining and using needed leadership competencies and feel they are better able to perform their jobs, in a program that has proved its ability to adapt to priority developmental needs.
- The IT Roadmap initiative has provided a proof-of-concept, and is now poised to launch a significant workforce development process utilizing Go-Learn, an enterprise level, E-Government initiative.

Outlook for the Future

Finally, this report focuses on the future. Where does the CIO community go from here? To what extent should workforce initiatives of the past be continued, and what new efforts should be undertaken? What is the proper and most effective role of the Committee in these efforts? This prospective view is discussed in terms of an integrated human capital strategy for the Federal IT workforce, one that would address the strategic needs of the government as whole, not just from individual agencies' perspectives.

As e-government initiatives move forward, it is becoming increasingly clear that the IT workforce is a strategic asset not only to individual agencies, but also to the government enterprise as a whole. This "enterprise workforce" demands the focus and energy of the CIO Council in its role as leader of the IT community. It is also clear that the CIO Council alone cannot solve IT workforce problems. The human resources (HR)

community, including agency HR directors and the Office of Personnel Management, must be involved and engaged before real change can occur. The success of HR and CIO collaboration has been demonstrated by several of the efforts described in this report, and the recommendations for the future presume that a similar or even greater level of collaboration will occur in the future.

Broader Scale Reform - The National Academy of Public Administration Report

To examine the potential for broader scale reform, the Committee (together with the Administrative Office of the U.S. Courts) commissioned an independent study by the National Academy of Public Administration (NAPA). The final report, released in September 2001, was entitled, "The Transforming Power of Information Technology -- Making the Federal Government an Employer of Choice for IT Employees." The study calls for substantial reforms, including eliminating the current tenure based pay system used Government-wide in favor of four broad market-based pay bands for IT professionals and managers. It proposes placing a larger premium on individual performance and significantly rewarding outstanding performers. Finally, the report stresses the importance of continuous learning and the need to invest in employee training and development. A summary of NAPA's recommendations is provided below:

1. Establish a market-based pay for performance compensation system.
2. Allow for flexibility in the treatment of individuals and occupations.
3. Improve the recruiting and hiring processes.
4. Balance three dimensions of equity: internal, external, and contribution.
5. Offer competitive benefits.
6. Promote work/life balance programs.
7. Encourage management ownership.
8. Support technical currency and continuous learning.
9. Build reliability, clarity and transparency into the new systems.

In February 2002, the CIO Council issued a statement in support of the NAPA study's principles, supporting its conclusions and broad themes:

"We support and concur in NAPA's conclusions that Federal IT salaries need to take into account current market conditions and evolving IT disciplines. We also concur that meeting organizational and personal performance objectives should play a greater role in individual compensation determination. NAPA appropriately stated that work/life balance is critical to attracting new and younger workers. The Council encourages its member agencies to do a better job of marketing in this area and also encourages them to develop better and more targeted career development programs for IT professionals."

The NAPA report also introduced, and the Council endorsed, the notion of "a rational transition," that should provide opportunities for input, participation, and tailoring of solutions by agencies, employees, and employee representatives. As NAPA noted in its report, many of its proposals have already been implemented in a variety of agencies with

current authority to do so, but comprehensive implementation of NAPA's recommendations cannot be accomplished without new legislation.

After the report was issued, the Committee began to work with Congressional staff to explore opportunities for such change. Independently, however, the Homeland Security Act of 2002 (signed on November 25, 2002) has provided legislative authority to implement most of NAPA's recommendations, at least within the new Department. The Department of Homeland Security, in collaboration with OPM and its own employees, will have the ability to develop and implement a flexible market-based pay-for-performance system, which is a key recommendation of the NAPA report. While the most sweeping personnel reforms are being reserved for the new Department, some other reforms will be applied to the entire government including:

- *Categorical Ranking* – which allows managers to select a candidate from a larger pool instead of the currently allowed top three.
- *Direct Hire Authority* – can be granted by OPM to agencies facing severe shortages of candidates or a critical hiring need.
- *Higher Education* – agencies will have the authority to pay for their employees' academic degrees.

However, the absence of Government-wide authority to implement the principles embodied in the NAPA report remains a challenge, one that may be addressed by one or more of the workforce reforms that are currently in the preliminary stages of Congressional consideration.

Acknowledgements

Federal Management Partners, Inc., wrote this report under contract for the Federal CIO Council's Workforce and Human Capital for Information Technology (IT) Committee. Numerous Committee Team Leaders provided program information. The Office of Personnel Management provided information on collaborative projects along with specific data regarding the Information Technology workforce.

“We all buy the same equipment. The difference between good IT and bad IT is the people. The human element is essential.”

Steven Yohai, former CIO, U.S. Office of the Comptroller of the Currency²

I. WORKFORCE PLANNING AND MANAGEMENT

The Workforce of Tomorrow

Overview



The labor market for IT professionals has changed dramatically in the last 18 months. The terrorist attacks and the unraveling of numerous corporate accounting scandals exacerbated the implosion of the dot-com sector. These events have slowed the economy as a whole and impacted overall employment; the November 2002 jobless rate of 6 percent matched April's figure as the highest level in 8 years.³ The technology sector, however, appears to have been particularly hard hit. According to the

Information Technology Association of America (ITAA) annual workforce study and quarterly reports, 528,000 more IT professionals were let go in 2001 than hired. The recent volatility in the IT sector, however, appears to be stabilizing. The rate of dismissals slowed significantly in 2002, dropping by 68 percent: from 2.6 million between January 2001 and January 2002 to 844 thousand between October 2001 and October 2002. Hiring managers are also showing signs of optimism predicting they will need to hire nearly 1.2 million IT workers in the upcoming months. While this number is similar to predictions in January 2001, demand had dropped by 27 percent in June 2002 when managers predicted they would need to hire only 835,000 workers.⁴ In a September statement, ITAA President Harris Miller said his main concern was that, “a sluggish job market today could turn off many prospective information systems and computer science students, resulting in rampant IT talent shortages a few years down the road.”⁵

Unfortunately, there is already evidence confirming that very trend. According to a report by the Computing Research Association, the number of undergraduates majoring in computer science declined 1 percent in 2001 after two years of sharp increases. At Virginia Tech, enrollment of undergraduates in the computer science department dropped

² Therese Morin, Ken Devansky, Gard Little, and Craig Petrun, *Information Leadership: A Guide for Government Executives*, (PricewaterhouseCoopers, LLP, 1999), pg. 58.

³ U.S. Department of Labor, Bureau of Labor Statistics Online, *Employment Situation Summary*, (Washington, D.C., December 9, 2002).

⁴ Information Technology Association of America (ITAA) Online, *Quarterly Update*, December 18, 2002.

⁵ ITAA Online, *Bouncing Back*, September 2002.

25 percent to 300. At George Washington University and the University of Maryland the number of incoming freshmen who plan on studying computer science fell by nearly half. Despite the numbers, the dean of Maryland’s College of Computer, Mathematical and Physical Sciences does not expect to see a similar decrease in the number of graduates, asserting that many of those students would have switched majors eventually anyway. Still, additional anecdotal evidence suggests that the burst of the technology bubble has eliminated much of IT’s previous cachet and the stereotype of computer science as a “nerdy” profession is returning.⁶

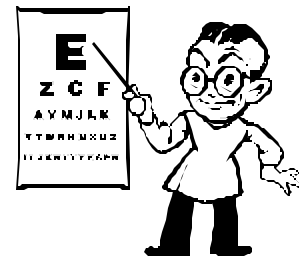
Aging of the Federal IT Workforce

For the federal government, any future talent shortage will coincide with the large wave of retirements expected in the next 10 years. According to OPM statistics, while the Federal IT workforce has grown moderately in the past five years, it has also aged. Between FY1996 and FY2001 the IT workforce grew 11 percent, from 59,649 to 66,391. (It is worth noting that during this same timeframe the size of the entire Federal workforce declined by 6 percent from 1.6 million to 1.5 million.) At the same time, the percentage of IT workers over 50 increased from 27 percent to 36 percent. This number is particularly significant as it indicates the percentage of workers approaching eligibility for retirement. Furthermore, in FY2001 fully 75 percent of the total IT workforce was over the age of 40.⁷ The size and age of the Federal IT Workforce is illustrated in the chart below.

| SIZE AND AGE OF THE IT WORKFORCE* | | | | |
|--|------------------------|----------------|------------------------|----------------|
| Age | Total Workforce | FY 1996 | Total Workforce | FY 2001 |
| 20-29 | 3,382 | 5% | 2,467 | 4% |
| 30-39 | 17,808 | 28% | 14,034 | 21% |
| 40-49 | 25,635 | 40% | 25,775 | 39% |
| 50-59 | 15,014 | 24% | 21,117 | 32% |
| Over 60 | 2,007 | 3% | 2,938 | 4% |
| Total | 59,649 | 100% | 66,391 | 100% |

* The IT workforce consists of non-seasonal, full-time, permanent employees in the following occupational series: GS-334 Computer Specialist, GS-854 Software Engineering, GS-1550 Computer Science and GS-2210 Information Technology.

In its 2001 Retirement Statistics, OPM projected that in the five years between FY2001 and FY2005 the Federal IT workforce would have a cumulative retirement rate of 16.7 percent. This translates into a yearly average rate of 3.3 percent. In FY2001, however, the actual IT workforce retirement rate was only 1.9



⁶ Ellen McCarthy, “Tech’s Major Decline College Students Turning Away From Bits and Bytes,” *The Washington Post Online*, (Washington D.C., August 27, 2002), pg. E01.

⁷ U.S. Office of Personnel Management, Central Personnel Data File, Employment Trends (Washington, D.C., September 1996, 2001), www.fedscope.opm.gov.

percent. While projections are inherently inexact, this was a significant slowdown. The drop, however, is likely due to the state of the economy in general and the technology sector in particular. With such a large proportion of the IT workforce approaching retirement eligibility, however, it is still safe to assume that the rate of retirements will start to increase significantly. In addition, given historic trends, once the economy turns around there will likely be an increase in attrition among younger workers unless the Federal government firmly establishes itself as an employer of choice.

| BREAKDOWN OF IT WORKFORCE TURNOVER IN FY2001 | | | | | | | |
|---|------------------------|----------------------------|---------------------|-----------------------------------|----------------------------|-------------------------------|-----------------------|
| Age | Total Workforce | Total No. that Quit | Percent Quit | Total No. that Transferred | Percent Transferred | Total No. that Retired | Percent Retire |
| 20-29 | 2,467 | 115 | 4.7% | 31 | 1.3% | 0 | -- |
| 30-39 | 14,034 | 362 | 2.6% | 196 | 1.4% | 9 | 0.1% |
| 40-49 | 25,775 | 307 | 1.2% | 383 | 1.5% | 65 | 0.3% |
| 50-59 | 21,117 | 102 | 0.5% | 151 | 0.7% | 734 | 3.5% |
| Over 60 | 2,938 | 4 | 0.1% | 8 | 0.3% | 441 | 15.0% |
| Total | 66,391 | 890 | 1.3% | 769 | 1.2% | 1,249 | 1.9% |

As illustrated in the table above, current overall turnover rates for Federal IT workers are low. Clearly, a certain amount of turnover is desirable. Increasing mobility between the public and private sectors would infuse the workforce with a dynamism particularly important for IT. The IT workforce of tomorrow may very well follow the most intriguing projects regardless of which agency or sector (public or private) they are in. This will only happen, however, if barriers to entry into the Federal workforce are lowered dramatically. Not only will recruitment packages need to be competitive with the private sector, but also hiring timeframes will have to be reduced from the current standard of 4-6 months to 4-6 weeks. Career development will need to be widely accepted as imperative so that employees will not only be encouraged, but also expected, to avail themselves of a variety of developmental opportunities.

A Window of Opportunity

The temporary slowdown in the demand for IT workers and retirement rates in the Federal government have produced a window of opportunity for CIOs – a time for taking stock, exploring best practices, and adapting them to their own agencies' needs. This is also an opportunity to examine the state of the entire Federal Government's IT workforce - - the "enterprise workforce" that is essential to accomplishing government-wide objectives, including e-government initiatives.



While there is currently a marked slowdown, no one doubts it is transitory. In fact, the Bureau of Labor Statistics is forecasting that 8 of the 10 fastest growing

occupations during this decade will be computer related.⁸ Demographics dictate that a large wave of retirements is coming. The previous technology boom clearly illustrated the Federal Government's inability to compete for talent. The IT Workforce Committee needs to lead the CIO community in continuing to improve the strategic management of IT professionals so that when the economy turns around and 30-year careers are mostly a phenomenon of the past, the Federal Government is prepared to successfully navigate through and compete in the altered landscape. A blueprint for an integrated human capital strategy for the enterprise IT workforce is provided in the "Outlook for the Future" section of the paper.

Workforce Planning

In order to take advantage of the "window of opportunity" presented by today's economy, Federal CIOs will need to manage the transition from today's workforce to tomorrow's. In addition, two specific requirements are driving CIOs toward more active roles in workforce planning:

- *The Clinger-Cohen Act (Section 5125 (c)(3))* - requires that CIOs "annually, as part of the strategic planning and performance evaluation process" assess IT knowledge and skill requirements and the extent to which agency executive and management personnel meet these knowledge and skill requirements. Further, Clinger-Cohen requires CIOs to develop workforce plans ("hiring, training, and professional development") to remedy any deficiencies identified.
- *The Human Capital Scorecard* - which is a key component of the President's Management Agenda (PMA), contains a major element on workforce planning. OPM's recently published Human Capital Standards define success in this element as "...an explicit workforce planning strategy, linked to the agency's strategic and program planning efforts, to identify its current and future human capital needs, including the size of the workforce, its deployment across the organization, and the competencies needed for the agency to fulfill its mission." It should be noted that the PMA also contains a competitive sourcing initiative, which clearly has implications for any strategic workforce planning effort.

OMB's budget guidance for FY 2004 reinforced the importance of both these requirements by stating that "All agencies are required to provide an IT workforce assessment, as called for in the Clinger-Cohen Act and consistent with the PMA Human Capital initiative."

A number of initiatives that have been accomplished with a great deal of effort on the part of the CIO Council's Workforce Committee, have well positioned CIOs and the IT workforce to play an integral role in their agencies' workforce planning efforts. First, the development of specialty titles allows CIOs to group their workforces together in more meaningful ways and enables them to easily compare their workforces with other

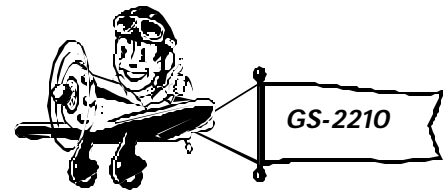
⁸ U.S. Department of Labor, Bureau of Labor Statistics, *Occupational Outlook Handbook 2002-03 Edition*, (Washington, D.C., January 2002), pp.5-7.

agencies and the private sector. This will be critically important when agencies are assessing their capabilities and determining their recruiting needs and outsourcing possibilities. Secondly, the core competency framework established by the Council positions CIOs to do the analysis required by the Clinger-Cohen Act and to respond to OMB's FY 2004 guidance. Workforce planning will give CIOs the opportunity to assess their workforces against the established competencies to determine where important skill gaps are and how to address them. Finally, workforce planning is an especially useful tool for a profession as dynamic as information technology. The nature of IT work is one of constant change and the workforce planning process will allow this to be reflected more accurately and rapidly to allow for strategic human capital management and to support the recruitment and retention of critical skills. At the moment, workforce planning will be particularly useful for CIOs as they try to identify and develop employees with appropriate project management skills and experience to lead expansive E-government initiatives.

Two workforce planning pilot studies by the Department of Labor are illustrative of this point. One is a horizontal assessment of the IT Security and Privacy work function across six major DOL agencies, and the other is a vertical assessment of DOL's Information Technology Center's workforce. This may prove to be a good case study for members of the CIO Council as it relates specifically to an IT function and an IT workforce.

IT Job Classification

Since its inception, the IT Workforce Committee has worked extensively with OPM to create a specific IT occupational series along with job specialty titles to reflect the changing nature of IT work. The first step in this process was the creation of the ten specialties or "parenthetical" titles for IT. These job titles are listed below and were released in March 2000 after extensive work with the Committee and technical experts.



Policy and Planning
Security
Systems Analysis
Applications Software
Operating Systems

Network Services
Data Management
Internet
Systems Administration
Customer Support

IT Occupational Series

In May 2001, OPM issued the Job Family Position Classification Standard for the Information Technology Group, GS-2200, with the new Information Technology Management Series, GS-2210, and parenthetical specialty titles. This new series will ultimately replace the GS-334 Computer Specialist Series and enable the Federal government to classify, describe and analyze its workforce in a more meaningful way.

This will allow for workforce comparisons between agencies and with the private sector to be made more readily and will help managers determine what skills they have and which ones they need to buy. All new hires are being placed into the GS-2210 IT Management Series and migration of GS-334s into the new series is ongoing. The chart below illustrates how this migration significantly picked up speed in the last quarter and currently stands at 70% of all Computer Specialists.

| QUARTERLY EMPLOYMENT DATA | | | | | |
|--|-------------------|------------------|-------------------|------------------|-------------------|
| IT Workforce⁹ | | | | | |
| Occupational Series | Sept. 2001 | Dec. 2001 | March 2002 | June 2002 | Sept. 2002 |
| Computer Specialist GS-334 | 59,058 | 52,659 | 47,163 | 36,461 | 19,272 |
| Information Technology Mgmt GS-2210 | 485 | 8,509 | 14,799 | 26,470 | 44,655 |
| <i>Sub-Total (GS-334 + GS-2210)</i> | 59,543 | 61,159 | 61,962 | 62,931 | 63,927 |
| <i>Percentage Converted to GS-2210 Series</i> | 0.8% | 14% | 24% | 42% | 70% |
| Computer Engineering GS-854 | 3,031 | 3,186 | 3,286 | 3,327 | 3,429 |
| Computer Science GS-1550 | 3,821 | 3,975 | 4,051 | 4,197 | 4,340 |
| Total IT Workforce | 66,395 | 68,320 | 69,299 | 70,449 | 71,695 |

As of June 2002, OPM data show that nearly 14% of all employees classified in the GS-2210 series have transferred from occupations outside the traditional IT workforce series of Computer Specialist (GS-334). This can partially be explained by jobs that had a large technological component, but did not neatly “fit” anywhere else and could not be captured as part of the IT workforce. The Special Pay Rate implemented in January 2001 for Computer Specialists in levels GS-5 through GS-12 also gave agencies an incentive to utilize the IT series, when appropriate, to attract and retain highly qualified employees.

Completing the Conversion to the IT Management Series

Part of the rationale for creating a new occupational series and specialty titles was to reflect the dynamic nature of the IT sector and to categorize the large IT workforce in a more meaningful way. As of September 2002, there were 71,695 people in the IT workforce, making it the third largest occupation in the Federal government. Aggregate data on a workforce that large disguises problem areas within individual specialties. In the past, the demand for IT workers so outstripped supply it was easy to speak of the IT workforce as a monolithic entity. That is no longer the case. The economic slowdown has illustrated that demand for IT workers is not equal, but driven by technical skills and competencies. If the CIO community hopes to manage its workforce in a strategic

⁹ U.S. Office of Personnel Management, Central Personnel Data File, Employment Trend (Quarter-Quarter), www.fedscope.opm.gov.

manner it needs to have access to more detailed information. There are two steps the CIO Workforce Committee can take to make this happen:

Recommendations:

1. *Ensure agencies complete the conversion process from GS-334 Computer Specialists and other series to the GS-2210 IT Management occupational series by July 2003.*
2. *To support IT workforce planning and management efforts, obtain an agreement with OPM to categorize the IT workforce data available in the Central Personnel Data File (CPDF) and on FedScope into the ten job specialties already established.*

FedScope, part of OPM's website, has given the public access to large amounts of workforce data contained in the CPDF. This tool makes it relatively easy to get a snapshot of the IT workforce in terms of its size, grade, age, turnover and numerous other data elements. However, at this juncture, the data cannot be categorized by parenthetical titles or job specialties. This appears to be the next logical step in this initiative. The more detailed data will ultimately enable the Committee as a whole, along with individual agencies, to get a better understanding of which specialties are most in demand. CIO's will be able to strategically manage their workforce by targeting their recruitment, retention and training efforts and the Committee will be able to strategically target its initiatives as well.

"The most binding restraint to achieving electronic government is that we lack the workforce competencies to strategically manage projects. You can outsource a lot of the work, but you can't outsource management."

-- Mark Forman,
Associate Director of Information Technology and Electronic Government, OMB¹⁰

Project Management

E-government projects are emphasizing the importance of project management skills. More and more IT work is being accomplished by multi-agency teams, or combined with competitive sourcing, and the requirement for project management expertise is becoming a critical success factor.

In order to address this need, the Workforce Committee initiated an effort to more clearly define the role and qualifications of project managers by seeking OPM guidance on their classification, qualification, and compensation. In the summer of 2002, OPM conducted

¹⁰ Karen Robb, "Standardized IT Manager Training Needed, Say Experts," *Federal Times*, November 11, 2002.

focus groups with project managers from both the public and private sectors to obtain information on the nature of the project manager's role. OPM issued draft guidance in October. Agencies provided comments back to OPM in November.

The resulting OPM guidance, which is expected to be issued shortly, will address the definition of project management, duties and responsibilities of project managers, and qualifications requirements (including certification and job experience or education), for a variety of occupations. An important aspect of this guidance is that it will allow for the creation of GS-15 project management positions and illustrates the types of functions that SES project management positions might perform. This will create a job-track for project managers and will enable agencies to develop and foster people with the special skills needed for managing complex and interagency e-government projects. These guidelines will help establish a cadre of project managers with the skills to move between agencies as needed.

Additional impetus for this effort was provided recently by OMB's budget guidance to agencies for FY 2004. The OMB "pass back" language, issued in early December 2002, asks agencies to identify qualified project managers for major IT projects. OMB also says that such projects without qualified project management and project management plans (with validated cost, schedule, and performance estimates, etc.) will be placed on a "watch list".

OMB does not specify the criteria for establishing the qualifications or assessing the experience of project managers; therefore the CIO Council can and should play a role in sorting out how to deal with the requirement. OPM's guidance should prove valuable in this effort, but the application of that guidance to the IT world will require clear definition of the criteria used to judge compliance with OMB's requirement.

Recommendation: Establish a work group to assist CIOs and OMB in coming to agreement on the criteria used to judge the qualifications of project managers for IT initiatives covered by the "pass back" language.

II. RECRUITMENT AND RETENTION

Virtual Job Fair

In a hearing about the NAPA report on the federal IT workforce, Subcommittee Chairman Tom Davis (R-VA) noted that the slowing economy and failure of many "dot coms" left many talented IT employees without jobs. He suggested that the government had a unique opportunity to upgrade its workforce and help the national economy recover by recruiting and hiring as many of these skilled IT workers as possible. In response, the CIO's Workforce Committee teamed together with OPM to hold the first national Virtual IT Job Fair from April 22-26, 2002. Making extensive use of Web technology to screen and assess applicants, the job fair processed 18,832 applications for 270 job openings. The assessment tools worked successfully and screened out half of the applicants.

Ultimately, the agencies were very pleased with the quality of the applicants and 113 positions were filled. While this is an impressive number of hires for a single recruiting event, agencies did not appear to leverage this innovative approach to the extent possible.

| <i>Snapshot of the Virtual Job Fair</i> | |
|--|--|
| When: Sponsored by: | April 22-26, 2002 CIO Council and OPM |
| Participating Departments and Agencies: | 23 |
| Job Openings: Grade Ranges: | 270 GS-7 through GS-13 |
| Total hits: Applications Received: Total Qualified Applicants: | 2.3 million 18,832 about 50% |
| Positions Filled: | 113 |
| Speed of Hiring Process: | 4-6 weeks vs. 4-6 months |

The Process

The CIO Council and OPM worked closely together in order to make the Virtual Job Fair come to fruition. One week before the Virtual Job Fair there was a marketing blitz to promote the event. Advertisements were placed in numerous newspapers, radio stations and on-line recruitment sites including the *Washington Post*, *New York Times*, *USA Today* and *Monster.com*. The response was overwhelming and OPM added two more servers to handle traffic on the first day of the fair. Still, many applicants complained of slow servers, constant “server busy” messages and uncertainty if their applications were properly sent to OPM. The website recorded nearly 2.3 million hits during the two weeks it was active.

The Virtual Job Fair used innovative technology and an on-line application process to assess applicants. This enabled applicants to apply for multiple positions without having to submit multiple applications. The screening process included a brief background questionnaire, technology aptitude tests and an interactive IT skills inventory. The competency tests included an IT Awareness test and an Internet Concepts test. The skills inventory tests required applicants to evaluate their proficiency on 145 various critical IT technical competencies and four general competencies: (1) interpersonal skills; (2) teamwork; (3) problem solving; and (4) planning and evaluating. The on-line tests worked as intended and screened out half of the applicants. Successful candidates were forwarded to OPM for rating and ranking and participating agencies requested 202 selection certificates. OPM issued the selection certificates 15 days after the first day of

the job fair that were valid for 30 days. Ultimately, the federal government made 136 job offers and filled 113 of the positions it posted for the job fair.

Best Practices from the State Department

The Department of State made the best use of the Virtual Job Fair and had the most hiring success. The fair was a pilot for everyone but State, which had held two Web-enabled recruiting events in 1999 that served as the prototype for the government-wide event. State's approach holds some valuable lessons for those agencies that would like to leverage this type centralized recruiting effort. State posted 70 Foreign Service IT positions and 103 civil service position for the Virtual Job Fair. The key to their success, however, was their aggressive follow-up to the Job Fair and the close collaboration of the CIO Office with Human Resources. Using 100 volunteers, State sponsored an interview day two weeks after the job fair where they conducted personal interviews and preliminary security checks for almost 70 applicants who scored at the top of the rankings. An additional 130 interviews were conducted over the phone and, ultimately, 82 on-the-spot offers were made that day. State was extremely impressed with the caliber of the candidates that came through the process and, to date, 106 people have been hired.

"The Virtual Job Fair worked. We were able to make 'on the spot' job offers within 15 days of the closing of the web site with the first person on board within three weeks. This is unheard of in federal government hiring. Additionally, we found that the overall skill caliber of candidates was the highest we have seen in any of our major recruitment efforts."

-- Pat Popovich, Deputy CIO for Management, U.S. Department of State

Lessons Learned

The Virtual Job Fair, however, was not as successful as it might have been for a number of reasons. The 270 jobs identified for the fair represented 12.5 percent of all IT new employees the Federal government hired in FY2001. Given the extensive lead-time agencies had in advance of the fair, it is surprising this number was not greater. Agencies may have had difficulty timing the job openings they did have and forecasting vacancies in the future. Managers undoubtedly had to decide whether to abandon positions they were in the process of filling in order to try and fill them through this process. In addition, too many agencies were unprepared to take action on the selection certifications OPM quickly provided. While 23 agencies participated in the job fair, only 7 hired people and the bulk of them were hired by the Department of State. As mentioned above, one of the keys to State's success was their close collaboration with their HR Office. Focus groups OPM conducted with Job Fair participants suggest that other agencies' inability to leverage the Job Fair was due in large part to the lack of teamwork between CIO and HR Offices.

A Virtual Job Fair for the entire IT workforce and all of its 10 specialties was an ambitious undertaking, perhaps too big. If job fairs in the future were strategically targeted towards the few specialties agencies are having the most difficulty in hiring, they might be more successful. More targeted efforts would generate a critical amount of interest in agencies and screening tests could be more finely tailored to the skills needed in just a few specialties rather than the entire occupation. Further, job fairs could be used to generate, on an open and continuous basis, candidate pools from which selections and job offers could be made.

Still, the Virtual Job Fair was a monumental achievement and successful new initiative. The next step is to think strategically about how best to use the technology demonstrated and decide whether more hiring success could be generated through more targeted recruitment efforts.

OPM RECRUITMENT AND RETENTION INCENTIVES

Special Salary Rates

When the Government's ability to recruit and retain employees is significantly handicapped by its inability to compete with private sector salaries, OPM may establish special salary rates. In 2000, the IT Workforce Committee worked closely with OPM to study pay disparities for IT workers and establish special salary rates. The result was not an increase in pay for all IT workers, but rather a targeted approach geared towards entry-level and developmental-level Federal IT workers with the latest skills. In January 2001, OPM implemented special salary rates for the IT Workforce covering the Computer Specialists, Computer Engineers, Computer Scientists and (now) the Information Technology occupational series. The rates cover workers in General Schedule grades GS-5 through GS-12 and, at the time, produced overall net increases of 7 percent to 33 percent for the IT workers.

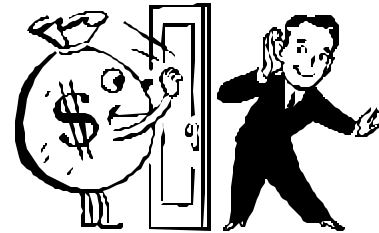
The number of employees covered by the special salary rates has increased 15.6 percent since their inception, from 36,631 in January 2001 to 42,333 in June 2002. The increase is only slightly larger than the growth in the entire IT workforce during the same timeframe, which was 14.6 percent. However, the IT workforce is growing substantially faster than the Federal workforce as a whole, which during this same timeframe only grew by 2 percent.

OPM's Office of Oversight and Effectiveness has begun a detailed study of the usage and impact of these special salary rates. This study, which will include interviews with new employees hired under the special rates, is expected to be completed in June 2003.

Pay Flexibilities

The Federal Employees Pay Comparability Act of 1990 contained a number of provisions to assist Federal agencies in recruiting, relocating and retaining employees. Agencies have been authorized to use this group of pay flexibilities, often referred to as the “3R’s,” since March 1991. The flexibilities allow agencies to pay one-time bonuses of up to 25% of salary to recruit new employees (recruitment bonuses) and relocate current employees (relocation bonuses) to difficult to fill positions. Agencies also may pay retention allowances on a biweekly basis of up to 25% of salary to retain an employee with unique qualifications who would otherwise likely leave Federal service. Retention allowances are renewable.¹¹

To the extent the pay flexibilities are utilized, it appears that IT specialists are well represented. Managers appear to favor retention allowances the most. The chart below illustrates that in the three years between FY1999-FY2001, IT workers received more retention allowances, 16.5%, than any other occupation. These results, however, are somewhat skewed by the Y2K challenge.



In FY1999, IT specialists received an exceptionally large proportion of all retention allowances, 38 percent.

| RETENTION ALLOWANCES BY OCCUPATION | | |
|---|---------------|----------------|
| October 1998 – September 2001 | | |
| Series | Number | Percent |
| IT Specialist | 2,200 | 16.2% |
| Pilot | 1,544 | 11.4% |
| Pharmacist | 893 | 6.6% |
| Nurse | 855 | 6.3% |
| Medical Officer | 732 | 5.4% |
| Police | 638 | 4.7% |
| Able Seamen-Maintenance | 310 | 2.3% |
| Other Series | 6,387 | 47.1% |
| Total All Series | 13,559 | 100.0% |

The IT workforce is also well represented in the use of recruitment and relocation bonuses. The chart below illustrates that in the three years between FY1999-FY2001, the IT occupation received the second largest amount of both types of bonuses. IT Specialists received 993 recruitment bonuses, which represents 8.9 percent of the total.

¹¹ U.S. Office of Personnel Management, Office of Merit Systems Oversight and Effectiveness, *The 3Rs: Lessons Learned from Recruitment, Relocation, and Retention Incentives*, (Washington, D.C., December 1999), pg.3.

During this same timeframe, 237,561 people joined the Federal government and only 4.7 percent of them received recruitment bonuses. IT Specialists, therefore, were nearly twice as likely to receive a recruitment bonus as the average new hire. There has also been substantial growth in the use of this flexibility. In fact, between FY99 and FY01 there was a 123 percent increase in the use of recruitment bonuses for IT workers. Data from the first nine months of FY02, however, indicate that the use of this flexibility for IT workers will remain about the same as in FY01 when 474 bonuses were awarded.

| RECRUITMENT BONUSES BY OCCUPATION October 1998 – September 2001 | | |
|---|---------------|----------------|
| Series | Number | Percent |
| Border Patrol Agent | 1,349 | 12.1% |
| IT Specialist | 993 | 8.9% |
| Nurse | 855 | 7.7% |
| Electronics Engineer | 633 | 5.7% |
| Patent Examiner | 586 | 5.2% |
| Practical Nurse | 529 | 4.7% |
| Mechanical Engineer | 513 | 4.6% |
| Other Series | 5,714 | 51.1% |
| Total All Series | 11,172 | 100.0% |
| Total Federal New Hires | 237,561 | 4.7% |

As far as relocation bonuses are concerned, IT workers received 93 in the three years between FY99 and FY01, second only to engineers. Data from the first nine months of FY02 indicate that the use of this flexibility will remain about the same.¹²

| RELOCATION BONUSES BY OCCUPATION October 1998 – September 2001 | | |
|--|---------------|----------------|
| Series | Number | Percent |
| General Engineer | 99 | 5.4% |
| IT Specialist | 93 | 5.1% |
| Criminal Investigator | 87 | 4.7% |
| Nuclear Engineer | 77 | 4.2% |
| Nurse | 77 | 4.2% |
| Electronics Engineer | 74 | 4.0% |
| Medical Officer | 69 | 3.8% |
| Other Series | 1,263 | 68.7% |
| Total All Series | 1,839 | 100% |

¹² U.S. Office of Personnel Management, Workforce Compensation and Performance Service, Power Point Presentation and Central Personnel Data File, (Washington, D.C., 2002).

New Incentives

Two additional recruiting flexibilities have been added to the Federal manager's "toolbox". In August 2001, regulations allowing student loan repayments became effective. This flexibility permits agencies to pay up to \$6,000 in a calendar year per employee for student loan repayments up to a cumulative total of \$40,000 per employee. Many consider student loan repayments to be the "4th R", but as it is relatively new, its usage has been limited. In FY2001, OPM reports that only one student loan repayment was made. While seven more were paid in early FY2002, data for all of FY2002 is not yet available. OPM expects to report an increase in the use of the program.

The other flexibility that was added to the managers' toolkit was legislation passed in FY2002 allowing agencies to pay for professional credentials and the examinations to obtain them. Again, this flexibility is too new to know what its impact will be.

" . . . IT managers also can't go it alone. They have to work with their human resources offices. You have to have a partnership with your HR [colleagues]. That's where the workplace issues are going to be decided."

-- Ira Hobbs, Deputy CIO, U.S. Department of Agriculture¹³

Promoting the Use of Incentives

It does not appear that the recruitment and retention incentives currently available are used to the extent they could be considering the difficulty the government has hiring and keeping talented IT professionals. Historical trends indicate that it takes agencies quite a while to start using pay flexibilities and very few agencies appear to use any of them in a strategic manner. One encouraging exception, however, appears to be in the use of retention allowances. In the first nine months of FY2002, agencies used 9,469 retention allowances, compared with 6,705 that were granted in all of FY2001. This represents an overall increase of 41 percent and 4th quarter numbers are still outstanding. This may be an indication that agencies are attempting to stem the retirement wave.

The rest of the data used for this section was the most current comparative data available from OPM, FY2001. Complete FY2002 data is expected to be available in early 2003. One of the most important roles the Workforce Committee can play is that of promoter of existing pay flexibilities.

Recommendation: Obtain annual reports from OPM on usage of these tools for the IT workforce and sponsor collaborative work by agency CIOs and HR staffs to encourage additional use where appropriate.

¹³ Walker, Richard, "Recruiting, Management Policies on Font Burner," *Government Computer News Online*, November 18, 2002.

BEST PRACTICES FROM THE STATE DEPARTMENT

“Attract and Recruit – Train and Retain”

That is the theme of the State Department’s innovative human resources approach called the **Skills Incentive Pilot Program**. It is an impressive case study illustrating a CIO Office that is effectively leveraging existing pay flexibilities in order to attract and retain skilled technology workers.

In 1999, the State Department had a vacancy rate of 33 percent in technology positions. Three years into the Skills Incentive Pilot Program, that rate has dropped to 10 percent. The three major components of the program are:

- **Recruitment Bonuses** up to **25%** of salary;
- **Incentive/Retention Allowances** up to **15%** of salary for specific technological certifications and academic degrees; and
- **Superior Qualifications** to justify higher starting salaries.

Not only have the vacancy rates dropped, but the percentage of IT workers holding professional certifications in IT subjects has grown dramatically, from 12 percent of the IT workforce in 1999 to 50 percent in 2002. In addition, the State Department uses Salary.com to help determine competitive starting salaries whenever applicants have “superior qualifications”.

The pilot program has been very successful in its ability to attract and retain IT workers as well as in elevating the technical skills and competencies of its IT professionals. The matrices used by the State Department for both recruitment bonuses and incentive/retention allowances can be found in the Appendix.

Recommendation: Using State Department as a model and best practice, sponsor meetings/discussions with other agencies’ CIOs/staffs and HR to replicate effective hiring processes.

Federal Career Intern Program

The Federal Career Intern Program was established by an Executive Order in July 2000 and implementing regulations issued by OPM in December 2000. The program, which provides 2-year internships, is designed to attract exceptional candidates into a variety of occupations, including IT positions, at the GS-5, GS-7, and GS-9 levels. To avail themselves of the program, agencies must design formal training programs that provide a combination of professional experiences and formal training opportunities. Interns are hired using excepted service appointments that are not to exceed two years. Upon successful completion of their program, interns may be eligible for permanent placement within an agency.

The genesis of the Federal Career Internship Program was to provide agencies with a recruitment tool to help them with entry-level hiring and to develop formal training programs to increase the attractiveness of Federal government employment. While the program provides additional hiring flexibilities, its decentralized nature makes it difficult to assess its impact or publicize its existence. While the OPM website has general information on the program, there are no links to specific programs in individual agencies. In order to ensure that this recruitment flexibility and career development tool is being utilized, it is recommended that the Workforce Committee do the following:

Recommendations:

- 1. Survey its CIO organizations and determine if any agency has established an IT Career Internship Program. If no one has, encourage an agency to create a pilot program.*
- 2. Work with OPM to publicize existing IT Career Internship Programs by creating links to them (and others) on the OPM website.*
- 3. Encourage agencies to take advantage of the IT Career Internship Program recruitment flexibility and career development opportunity.*

Pilot Recruitment Project

In the summer of 2002, NAPA and the Partnership for Public Service (PPS) initiated an effort to support agencies that are willing to champion and experiment with the ideas in the NAPA report. The goal for this project is to demonstrate that even without massive reform, the government can begin to make cultural changes that will enable it to become an employer of choice for IT professionals. PPS will produce publicity on these results.

One Treasury bureau has agreed to take on this challenge. Throughout the summer and early fall the NAPA/PPS team gathered information by interviewing the entire management team, conducting an employee survey and several focus groups. A presentation of findings was prepared by the project team and presented to top managers by the CIO in October. The project team has since developed final recommendations and formulated a strategy to "brand" recruitment. According to the NAPA report "branding" entails developing a market identity which encompasses not only describing what the organization does and what positions are available, but the character and values of the organization as well. The project team is finalizing their recommendations and action plan with the CIO and is expected to brief the Workforce Committee in the near future.

INVESTING IN THE FUTURE

Scholarship for Service Program

Scholarship for Service was established as a result of a January 2000 Executive Order and is a component of the Federal Cyber Service Training and Education Initiatives. The program was created in response to Federal agency concerns that colleges and universities were not producing enough graduates in information technology, let alone information assurance. Through this initiative, the National Science Foundation (NSF) issues selected 4-year colleges and universities scholarship grants to attract students to the information assurance field. In return, students sign a service agreement and commit to work at a Federal agency during a summer internship and after they graduate. The goal of the program is to increase the number of qualified students entering the fields of information assurance and computer security and to increase the capacity of the United States higher education enterprise to produce professionals in these fields to meet the needs of our increasingly technological society. Currently, there are 156 students participating and 15 institutions. It is expected that an additional 100 students will enroll in the program in January 2003.

Operationally, Scholarship for Service is an interagency program administered by NSF in collaboration with OPM, which shares primary responsibility for managing the program – NSF in reviewing and processing the academic institutions' proposals and OPM in providing internships and employment for the scholars. The biggest challenge is, and will always be, the placement of students for both the internships and post-graduation employment. The placement problem is exacerbated by the fact that there is not an appointing authority specifically for the Scholarship for Service program. For these reasons, OPM has partnered with the CIO's Workforce Committee to match scholarship recipients to government needs in information assurance.

The CIO Council is in an excellent position to assist in this effort for two reasons. First, a Co-Chair of the Council's IT Workforce Committee also serves on Critical Infrastructure Protection Board's Education Committee. Second, CIOs are charged with strengthening information assurance and infrastructure protection for their own agencies. While a partnership with the HR community will be important to success, the strongest motivation to utilize SFS graduates should come from within CIO organizations.

Recommendation: Sponsor a forum for CIOs and HR participants to highlight the features of the SFS program and develop strategies for placement of participants, both during and after their educational programs.

Student Outreach – HOT-IT

In October 2000, the IT Workforce Committee initiated the High School Outreach Team for Information Technology (HOT-IT) to promote high school students' interests and preparation for Federal IT careers. The team sponsors annual events like Groundhog Job Shadow Day as well as Federal CIO participation in Junior Job Fairs and similar events geared towards high school students.

Groundhog Job Shadow Day

"I had the distinct pleasure of hosting four students. . . We got a chance to look at different aspects of computer processing, from Local Area Networks to Mainframes to Personal Computers. The [students] were attentive, asked good questions, and most of all had fun! I was very impressed with them . . . Our future is in good hands!"

-- IT Host from U.S. Department of State

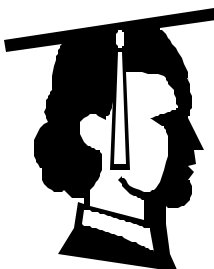
An annual event sponsored by the HOT-IT Team, "Groundhog Job Shadow Day" enables high school students to be exposed to Federal IT careers by shadowing an IT professional for a half-day. Nearly 100 students from Maryland, Virginia and Washington, D.C. participated in the program in February 2002 and were hosted by 8 different agencies. In addition, the Railroad Retirement Board in Chicago hosted 40 students on its own. Several agencies that participated in the Shadow Day also sponsored summer internships for high school students and its hoped that more will do so in the future.

In 2002, HOT-IT expanded its outreach work to include two new venues geared toward high school students:

- **Juniorjobs Career Fair** - In March 2002 representatives from HOT-IT participated in this event in which 40 area employers provided career information to youth from Fairfax, Prince William and Loudoun Counties in Virginia. The exhibit included information on Groundhog Job Shadow Day activities, Scholarship for Service, and information on career opportunities in several agencies.
- **TechTalk 2003** – The HOT-IT group will participate in this event sponsored by the Northern Virginia Technology Council in March 2003. IT professionals will share information with high school students about their career fields and industries. The format will also include an IT Expert Panel Discussion followed by breakout sessions with IT professionals.

TechTalk is a good example of the IT Workforce Committee leveraging its proximity to the Northern Virginia technology corridor and participating in a private/public sector event. HOT-IT hopes to participate in more events like these in the future and increase the number of agencies actively participating as well.

Partnership with the National Academy Foundation



In addition to the events sponsored by HOT-IT and outlined above, the team also has a longer-term strategy for developing IT professionals of the future. The cornerstone of this strategy is the recently established alliance between the CIO Council and the National Academy Foundation (NAF) which was formalized in a Memorandum of Understanding signed in November 2002. NAF is a national non-profit, education foundation that sponsors Academies of Information

Technology in high schools throughout the country. The objective of this partnership is to build educational alliances that develop early interest and exposure to Federal IT careers by identifying, attracting, and ultimately recruiting talented IT students for internships and entry-level positions.

The Academies of Information Technology program combines school-based learning and work-based experiences in IT professions. The program features a four-year academic program that augments standard curricula. In addition to their required courses, students are introduced to a rigorous IT curriculum, which includes courses like the following:

Strategies for Success in Computer Applications
Programming I and II
Introduction to Information Technology
Digital Media

Web Page Design
System Support and Maintenance
Digital Networks
Databases

Input from the IT Workforce Committee has ensured that issues of security and disability access to websites are included in the curriculum as well. Finally, students will obtain valuable work experience and exposure to Federal IT Careers through challenging summer or year-long internships in Federal agencies.

CIO Council Mentoring Program

The CIO Council has established a Planned Mentoring Program that provides diverse work assignments in IT for professionals at various stages in their career. Mentoring assignments are designed to last one year and consist of rotational assignments with one of the CIO Committees, the Chief Financial Officers (CFO) Council and the Procurement Executive Council. The idea is to develop the various technical, financial and procurement competencies needed to be a successful Federal IT professional. This program's activity has been limited to date, so it is premature to assess its impact.

III. CAREER DEVELOPMENT

CIO University

Overview

The CIO University program is a consortium of universities that offers graduate level courses that directly address the Clinger-Cohen core competencies for IT professionals. The program is sponsored by the Federal CIO Council and administered by GSA and is an impressive example of a public/private/academic partnership working together to prepare the IT workforce of tomorrow. The program creatively leverages a relatively small investment from the CIO Council's IT Workforce Committee and GSA into a full-fledged academic program.

The CIO University builds upon the Clinger Cohen core competencies by translating them into learning objectives that universities transform into course offerings. The core competencies are the knowledge, skills and abilities the CIO Council believes are crucial

to the effective management of technology resources in any CIO organization. The 68 competencies are classified under the following headings:

| | |
|--|---|
| <i>Policy and Organization</i> | <i>Capital Planning and Investment Assessment</i> |
| <i>Leadership/Management</i> | <i>Acquisition</i> |
| <i>Process/Change Management</i> | <i>E-Government/Electronic Business/Electronic Commerce</i> |
| <i>Information Resources Strategy and Planning</i> | <i>IT Security/Information Assurance</i> |
| <i>IT Performance Assessment: Models and Methods</i> | <i>Technical</i> |
| <i>Project/Program Management</i> | <i>Desk Top Technology Tools</i> |

One of the most important aspects of CIO University and the competencies is their dynamic nature. The Clinger-Cohen competencies, which were first developed in 1997, were revised in 2000 and will be revised every two years to reflect changes in the IT profession. Each time the competencies are revised experts from Government, industry, and academia participate in focus groups to produce a revised set of learning objectives from which universities adapt their course offerings.

There are currently six universities offering courses as part of CIO University in their facilities in the Washington, D.C. metropolitan area:

| | |
|------------------------------|---|
| Carnegie Mellon University | LaSalle University |
| George Mason University | Syracuse University |
| George Washington University | University of Maryland University College |

Carnegie Mellon, LaSalle and Syracuse Universities also offer courses on their respective campuses in Pennsylvania and New York. These universities all grant graduate degrees, graduate credits, continuing education units and CIO University Certificates using largely accelerated executive education formats. In addition, Carnegie Mellon offers a one-week survey course and portions of the University of Maryland classes are web-based.

Status

In June 2002, CIO University issued certificates to its third graduating class. Nearly 300 individuals have enrolled in CIO University since its inception in the fall of 1999 and graduating classes have grown steadily. So far, 151 individuals have received CIO University Certificates and an additional 125 are expected to complete the program in 2003. The public/private sector mix of students partially illustrates the recognized value of the program. While 42 percent of graduates have come from the public sector, fully 58 percent have come from the private sector. This is particularly important for the IT industry where a symbiotic relationship exists between the public and private sectors. Government is well served by enhancing the skills of IT executives in both sectors so that they can work together more efficiently. Furthermore, a cadre of private sector professionals that are trained in government-oriented IT competencies provides a potential recruiting pool for future Federal hiring initiatives.

CIO University started out as a pilot program. GSA is currently leading a strategic planning process with its academic partners to determine CIO University's future

direction. They will be grappling with questions concerning the size, geographic availability and effectiveness of the program.

“It was a very good experience and I recommend it to anyone who wants to advance in the ever-changing field of Information Technology.”

-- Recipient of CIO University Certificate

Selected CIO University Certificate recipients were contacted for this update on IT Workforce Committee initiatives. Although the sample was limited, ten out of ten respondents said they are better able to perform their current jobs and better prepared to take on additional responsibilities. To date, six out of ten had been given additional responsibilities since receiving their certificate. Half of the respondents said their education had a moderate impact on their ability to influence their organization’s products, processes and/or services. The other half was split between having a significant influence or none at all. Notably, the program does appear to be successful in teaching to the competencies. On average, the recipients felt their CIO University education had improved their knowledge and/or skills in 7.5 of the 11 competency areas.

STAR Program



Overview

The Strategic and Tactical Advocates for Results (STAR) Program is a cross-discipline, strategic leadership course sponsored by GSA and the CIO Council. It is a one-week residential course offered two-three times a year to mid- and upper-level Federal managers (GS-13s and above). The program emphasizes information technology as a strategic resource and is consequently geared towards top leaders in the information technology (CIO), finance (CFO), program (CEO), and procurement areas of an agency. STAR focuses on tomorrow’s e-government workplace where operational functions are outsourced and results-based management is paramount. The program covers the following topics:

| | |
|-------------------------------------|-----------------------------|
| Leadership | Technology and E-Government |
| Program and Project Management | Security |
| Capital Planning/Investment Process | Government and Congress |

Status

The STAR Program was initiated in 1999. Nearly 200 mid- and upper level federal managers will have participated in the eight sessions held through 2002. One of the most important aspects of the STAR program is its dynamic nature and its willingness to be responsive to student and sponsor feedback. For instance, in 2002 the length of the course was streamlined from two weeks to one. The goal was to reduce the cost of tuition as well as the time investment while still delivering the essence of the original program. In addition, OMB’s Capital Planning and Process was incorporated into the

curriculum in 2002 and the business case exercise was modified to gain “hands-on” experience with this process. These modifications helped to ensure that sponsoring agencies saw an immediate return on their investment and that participants had a relevant practical experience.

“It is a great way to develop leaders who can understand the new OMB requirements (and) lead large and complex IT projects and programs with (a) Business-like approach.”

“The curriculum was pertinent to my job and the President’s Management Agenda.”

-- STAR Program Participants

As part of this report, selected STAR Program participants were asked for general information on their professional backgrounds and objectives for taking the course. More importantly, questions were asked to ascertain the impact of the STAR Program in terms of the relevancy of its course curriculum to participants’ current jobs and its success in increasing knowledge in the Clinger-Cohen Core IT Competencies.

Of the 30 respondents, one-third had a predominantly technical background with the same number indicating a plurality of skills. Most frequently this was a combination of technical and business/management skills, but a few participants had financial or acquisition backgrounds.

One third of the respondents said developing their leadership competency was their primary objective for taking the course. The remaining 60 percent were about evenly split between developing a project management skill, career advancement or some combination of the three as their principal objective for participating in the program.

All 30 STAR participants indicated that they were better able to perform their current job because they had taken the STAR course. In addition, fully 90% believed they were better prepared to take on increased responsibilities and 77% said they had already been given increased responsibilities since taking the STAR course. This last number is particularly impressive given that nearly two-thirds of the respondents took the class in 2002. When asked to what extent their attendance at STAR had helped them influence their organization’s products, processes and/or services, 60 percent of the respondents indicated the course had a moderate impact with the remaining 40 percent evenly split between a significant impact and no impact at all.

The STAR Program does not attempt to teach to all of the Clinger-Cohen Competencies in its one-week long course, although it does purport to be a strategic leadership class. Survey results clearly indicate that STAR is very successful in increasing participants’ knowledge and/or skill in the competency area of Leadership and Management as well as Project/Program Management. The top-five competencies survey respondents believed had been improved as a result of their participation in STAR are listed in the table below.

| COMPETENCIES IMPROVED THROUGH STAR PROGRAM | | |
|--|---------------------------|--|
| Rank Order | Percentage of Respondents | Clinger-Cohen Core Competencies |
| 1 | 97% | Leadership and Management |
| 2 | 93% | Project/Program Management |
| 3 | 69% | Policy and Organization |
| 3 | 69% | Process and Change Management |
| 4 | 59% | Information Resources Strategy and Planning |
| 4 | 59% | IT Performance Assessment Models and Methods |
| 5 | 52% | E-Government/Electronic Business/Electronic Commerce |

“An incentive in the IT profession is to have a continuous learning opportunity. IT professionals want to be challenged, work with state-of-the-art technology and get ahead in their careers.”

-- Dr. Laura Callahan, CIO Department of Labor¹⁴

IT Roadmap Initiative

The cornerstone of the IT career development program is the IT Roadmap Initiative. Building upon a prototype developed for Department of the Navy civilians, the IT Roadmap is a career development tool for current and prospective Federal IT workers that will be available via the Web. The IT Roadmap outlines the general and technical competencies associated with the ten specialty titles contained within the GS-2210 IT Management series and listed below:



*Policy and Planning
Security
Systems Analysis
Applications Software
Operating Systems*

*Network Services
Data Management
Internet
Systems Administration
Customer Support*

The IT Roadmap allows IT professionals to conduct self-assessments to determine where skill gaps exist and to tailor career development plans to meet their specific needs. It is envisioned that individuals could select developmental opportunities from a wide variety of educational formats, i.e., on-line, seminars, classroom, certifications, and, eventually, experiential opportunities, i.e., details or special projects. The IT Roadmap will include a

¹⁴ Walker, November 18, 2002.

compendium of Federal training sources linked to specific competencies. An interactive component is being designed so that people can comment on and/or rate the quality of various training offerings, similar to the rating system used on Amazon.com. There will also be a link to GoLearn, which is a federal search engine of available on-line training opportunities. Finally, the IT Roadmap will include a Career Planning Guide that will assist IT professionals in setting and reaching career goals.

The IT Roadmap will assist IT workers manage their own careers and encourage them to seek development opportunities so that their skills remain proficient in the dynamic technology field. It is expected that a prototype of this innovative career development tool will be ready for testing in January 2003 and that the entire IT Roadmap will be launched in the spring of 2003.

Recommendation: Encourage CIOs to use the IT Roadmap to assess and develop their employees' competencies as part of their workforce planning and management efforts.

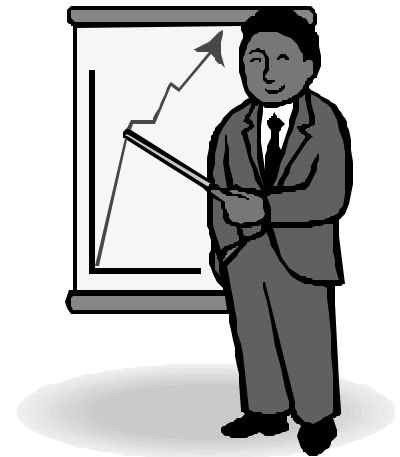
OUTLOOK FOR THE FUTURE

The IT workforce is strategically important to the Federal Government's ability to accomplish its varied missions, and therefore is an appropriate target for investments of time, energy, and resources. As described above, the CIO Council, through its Workforce and Human Capital for IT Committee, has undertaken a number of initiatives intended to strengthen and develop this workforce for the benefit of the Government as a whole.

Also as noted above, the Homeland Security Act provides an opportunity to implement many of the recommendations in the NAPA report, either within the Department of Homeland Security or across government. The E-Government Act, which provides additional opportunities for change was signed into law on December 17, 2002 and establishes a Federal CIO; makes the CIO Council a statutory body, the principal interagency IT forum; and provides for the establishment of a Federal Information Technology Training Program. It also contains a section authorizing an Information Technology Exchange Program, which allows exceptional Federal IT workers to be assigned to a private sector organization or a private sector employee to be assigned to a Federal agency, for a one-year developmental experience.

This bill builds upon previous initiatives to strategically manage the government's technology investments, including the physical infrastructure and human capital. Furthermore, the President's Management Agenda's emphasis on electronic government and human capital provides continued momentum toward action on IT workforce issues.

Where should the Council go from here? What is its most effective role in assuring the Government has the skills and competencies it needs to support the enterprise mission? One approach to answering these questions is to apply the Human Capital Scorecard, which Federal agencies are using to assess and address their individual workforce issues, to the Government-wide IT workforce. The application of the human capital model in this manner should help identify those areas in which the Council must concentrate its future efforts in order to assure success. The table below displays the basic elements of the OPM Human Capital Scorecard, together with a summary of the Council's initiatives to date, and identifies future actions needed to address the apparent gaps and ongoing needs. This model is intended to inform the specific recommendations listed at the conclusion of the report.



Integrated Human Capital Strategy for the Government-wide IT Workforce

| <i>Dimensions of Human Capital</i> | <i>Committee/Council Initiatives through 2002</i> | <i>Future Council Actions Recommended</i> |
|--|--|--|
| <p>Strategic Alignment:</p> <ul style="list-style-type: none"> Link IT workforce strategies to enterprise mission objectives, e.g., e-Government | <ul style="list-style-type: none"> Clinger-Cohen competencies development and updates Identification of three strategic competency areas: Project Managers, Solution Architects, and IT Security Specialists | <ul style="list-style-type: none"> Commit resources to an ongoing human capital strategy for the enterprise IT workforce, to include active individual leadership on the part of CIOs and institutional leadership through the Council's interactions with OPM and the HR community. Foster professionalism in the IT workforce such that persons with needed competencies are encouraged to move to where they are most needed. |
| <p>Workforce Planning and Deployment:</p> <ul style="list-style-type: none"> Explicit workforce planning strategy, linked to strategic and program planning efforts. Workforce positioned to serve citizens and meet mission and goals. | <ul style="list-style-type: none"> IT workforce trends analysis | <ul style="list-style-type: none"> Complete conversion to the GS-2210 series Develop data on IT specialties in CPDF for use in assessing enterprise-wide competency gaps Assist in defining qualifications criteria for project managers |
| <p>Talent:</p> <ul style="list-style-type: none"> Identify mission critical occupations and competencies needed in the current and future workforce, and develop strategies to close the gaps. Develop long-term strategies to attract, acquire, and retain quality talent. | <ul style="list-style-type: none"> Use of recruitment and relocation bonuses, retention allowances, and repayment of student loans; special salary rates Virtual job fair pilot HOT-IT and NAF programs Scholarship-for-service (SFS) program (cyber security) | <ul style="list-style-type: none"> Monitor usage and effectiveness of these tools on an ongoing basis Streamlined recruitment and hiring process as an ongoing practice Continue outreach programs to develop the IT workforce pipeline. Strategies for placement of SFS graduates |
| <p>Leadership and Knowledge Management:</p> <ul style="list-style-type: none"> Leadership planning and implementation Change management Integrity and employee commitment Strategic knowledge management Continuous learning | <ul style="list-style-type: none"> CIO University, STAR Clinger-Cohen competencies IT Roadmap pilots Legislation allowing payment for professional certifications | <ul style="list-style-type: none"> Continuous evaluation and adjustment of CIO University and STAR curricula to reflect future needs. Ongoing assessment of IT leaders Government-wide. Encourage use of Federal Career Intern Program. |
| <p>Results-Oriented Performance Culture:</p> <ul style="list-style-type: none"> Performance management Diversity Labor-management relations | <ul style="list-style-type: none"> NAPA study with recommendations for a market-based, pay-for-performance system. | <ul style="list-style-type: none"> Seek legislation to expand authority for market-based, pay-for-performance systems Government-wide. |

Recommendations for the CIO Council

Strategic Alignment

1. Commit resources to an ongoing human capital strategy for the enterprise IT workforce, to include active individual leadership on the part of CIOs and institutional leadership through the Council's interactions with OPM and the HR community.
 - The CIO council needs to keep its focus on workforce issues.
 - The CIO council should continue to direct the attention of OPM and the HR community on IT workforce issues.
 - Individual CIOs need to work with the HR function within their own agencies.
 - Just as it is doing with e-government initiatives, the Council should continue to devote its resources (time and money) to workforce issues.
2. Foster professionalism in the IT workforce such that persons with needed competencies are encouraged to move to where they are most needed.
 - Focus these efforts on strategic competencies and the need for project managers, solution architects and IT security specialists.
 - Establish a voluntary referral service for persons with these skills so that they may make themselves available for assignment to critical projects across government. One model is the central referral service established for Acquisition professionals at: www.doddacm.com/crs/
 - This would provide a central database of talents and skills, including certifications, e.g., PMI, on people that could be available for assignment across government.
 - Promote the use of professional certification, where appropriate, throughout the Federal IT workforce—not only more effective employees, but also facilitate movement between public and private sectors.
 - The pending Digital Tech Corps Act gives the CIO Council a role, together with OPM, in facilitating exchange assignments between agencies and private industry.

Workforce Planning and Deployment

3. Develop data on IT specialties in CPDF for use in assessing enterprise-wide competency gaps.
 - Work with OPM to categorize the IT workforce data available in the Central Personnel Data File (CPDF) and on FedScope into the ten job specialties already established.
 - Ensure agencies complete the conversion process from GS-334 Computer Specialists and other series to the GS-2210 IT Management occupational series by July 2003.

4. Establish a work group to assist CIOs and OMB in coming to agreement on the criteria used to judge the qualifications of project managers for IT initiatives covered by FY 2004 budget guidance.

Talent

5. Monitor usage and effectiveness of existing recruiting and retention tools on an ongoing basis.
 - Committee should get annual reports from OPM on usage of these tools.
 - Council should sponsor collaborative work by agency CIOs and HR staffs to encourage additional use where appropriate
6. Streamlined recruitment and hiring process as an ongoing practice.
 - Using State Department as a model and best practice, sponsor meetings/discussions with other agencies' CIOs/staffs and HR to replicate effective hiring process.
 - Continue to work with OPM to evaluate, improve, and streamline the hiring process, to include making maximum use of new flexibilities provided by the Homeland Security legislation.
7. Continue outreach programs to develop the IT workforce pipeline.
 - HOT-IT
 - NAF Academies
 - Mentoring programs
8. Sponsor a forum for CIOs and HR participants to highlight the features of the Scholarship-for-Service program and develop strategies for placement of participants, both during and after their educational programs.

Leadership and Knowledge Management

9. Continue ongoing evaluation and adjustment of CIO University and STAR curricula to reflect future needs.
 - Continue the biennial re-look at Clinger-Cohen competencies
 - Ongoing evaluation and adjustment of CIO-U and STAR (already being done by GSA)
10. Ongoing assessment of the competencies, quality, and quantity of IT leaders, Government-wide
 - OMB will be requiring agencies to report, either as part of their human capital scorecards, or in special requirements, on their progress in meeting the

Clinger-Cohen act mandate to assess the IT competencies in their agencies and develop plans to overcome any deficiencies.

- The IT Roadmap will be a valuable tool CIO organizations can use in the assessment and development of IT competencies in their agencies.
- CIO Council should sponsor collaborative efforts, involving both CIOs and HR staffs, to identify and adopt best practices in this area.

11. Federal Career Intern Program Recommendations

- Survey its CIO organizations and determine if any agency has established an IT Career Internship Program. If no one has, encourage an agency to create a pilot program.
- Work with OPM to publicize existing IT Career Internship Programs by creating links to them (and others) on the OPM website.
- Encourage agencies to take advantage of the IT Career Internship recruitment flexibility and career development opportunity.

12. Seek legislation to expand authority for a market-based pay for performance systems Government-wide.

- This would capitalize on the work of the National Academy of Public Administration (NAPA) and provide an opportunity to implement systems consistent with its principles across the entire IT workforce.
- Employees and their representatives should be engaged in designing and implementing the systems.

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BEST PRACTICES FROM THE STATE DEPARTMENT

The State Department is successfully leveraging existing pay flexibilities to recruit and retain IT employees. While their incentive program was highlighted as a Best Practice in the body of the Update 2002 Report, it is replicated here along with the matrices they use to encourage others to incorporate their streamlined practices.

“Attract and Recruit – Train and Retain”

That is the theme of the State Department’s innovative human resources approach called the **Skills Incentive Pilot Program**. It is an impressive case study illustrating a CIO Office that is effectively leveraging existing pay flexibilities in order to attract and retain skilled technology workers.

In 1999, the State Department had a vacancy rate of 33 percent in technology positions. Three years into the Skills Incentive Pilot Program, that rate has dropped to 10 percent. The three major components of the program are:

- **Recruitment Bonuses** up to **25%** of salary;
- **Incentive/Retention Allowances** up to **15%** of salary for specific technological certifications and academic degrees; and
- **Superior Qualifications** to justify higher starting salaries.

Not only have the vacancy rates dropped, but the percentage of IT workers holding professional certifications in IT subjects has grown dramatically, from 12 percent of the IT workforce in 1999 to 50 percent in 2002. In addition, the State Department uses Salary.com to help determine competitive starting salaries whenever applicants have “superior qualifications”.

The pilot program has been very successful in its ability to attract and retain IT workers as well as in elevating the technical skills and competencies of its IT professionals. The matrices used by the State Department for both recruitment bonuses and incentive/retention allowances can be found in the Appendix.

**CIVIL SERVICE COMPUTER SPECIALIST
RECRUITMENT BONUS MATRIX**

-- U.S. Department of State

The following qualifies for a bonus of up to 25% of salary

BS/BA Degree *plus* Microsoft Certified Systems Engineer (MCSE)

- With a *major* in the field of Computer Science, Computer Information Systems, Telecommunications, or Data Processing

OR

Microsoft Certified Systems Engineer and Cisco Certified Internetwork Expert (CCIE)

The following qualifies for a bonus of up to 20% of salary

BS/BA Degree *plus* Microsoft Certified Systems Engineer (MCSE)

- With a *minor* in the field of Computer Science, Computer Information Systems, Telecommunications, or Data Processing

OR

AAS Degree *plus* Microsoft Certified Systems Engineer (MCSE)

- Equivalent in the field of Computer Science, Computer Information Systems, Telecommunications, or Data Processing

OR

Technical Certificate *plus* Microsoft Certified Systems Engineer (MCSE)

- *Certificate of completion from any accredited Technical School (military or commercial if in related fields)*

The following qualifies for a bonus of up to 15% of salary

BS/BA Degree

- With a *major* in the field of Computer Science, Computer Information Systems, Telecommunications, or Data Processing

OR

Microsoft Certified Systems Engineer (MCSE)

The following qualifies for a bonus of up to 10% of salary

AAS Degree

- Equivalent in the field of Computer Science, Computer Information Systems, Telecommunications, or Data Processing

OR

Technical Certificate

- *Certificate of completion from any accredited Technical School (military or commercial if in related fields)*

OR

Microsoft Certified Professional Certification

**CIVIL SERVICE COMPUTER SPECIALIST
RETENTION ALLOWANCE MATRIX**

-- U.S. Department of State

Retention allowances are paid at the rate of 15%, 10% or 5% depending on the educational degrees and/or certifications submitted to the IT Professional Skills Panel. The Panel determines eligibility and rate of incentive to be paid based on documentation submitted. Retention allowances and criteria for eligibility follows:

The following qualifies for an allowance of up to 15% of salary

Microsoft Certified Systems Engineer (MCSE, MCSE+1) Certified Computing Professional (CCP)
Cisco Certified Network Expert (CCNP)
Oracle Certification Program (OCP) - with subsets of Database Administrator (DBA) and Applications Developer (AD)
CIO Certificate [IRM College, National Defense University (NDU)]
Approved Master's Degree – e.g., Computer Science or Information Systems (or equivalent title), etc. or a minimum of 30 credit hours at the graduate level in computer or information science, or Electrical Engineering.

The following qualifies for an allowance of up to 10% of salary

GIAC Security Engineer (GSE) – Includes six GSE-track certifications: (GSEC; GCFW; GCIA; GCWN; GCUX) and hold “honors” in at least one of the subject area certifications.
Certified Information Systems Security Professional (CISSP)
Systems Security Professional NTSSI No. 4001 Certificate (NDU)
Certified Web Professional – Master (CWP-Master)
USDA Graduate School Webmaster Certification; (Completion of six-part program)
Microsoft Certified Systems Administrator (MCSA)
Certified Lotus Professional (CLP) in Notes Systems Administrator R4.6
GSA 1000by2000 Certification
Approved Bachelor's Degree – e.g., Computer Science or Information Systems (or equivalent title), etc. or a minimum of 30 credit hours from the computer or information science department.
Technician Certificate: [A minimum of 5 weeks' worth of vendor technical training is required]
 IDNX or DGC Mux Certification
 Telephone Certificate from Mitel, Nortel, GTE or AT&T
 Radio/Satellite Certificate from Motorola, GE, Harris, Collins, Magnavox, McKay, or TWC.

The following qualifies for an allowance of up to 5% of salary

Microsoft Certified Professional (MCP) in Windows NT4.0 Server with A-Plus Certificate [CompTIA]
Comp TIA A-Plus Certification and the CompTIA Network-Plus Certification
Comp TIA A-Plus Certification and the CompTIA Internet- Plus (INET+)
Certified Web Professional Specialist (CWP-Specialist)
Microsoft Certified Professional (MCP) in Exchange 5.5 with A-Plus Certificate [CompTIA]
Cisco Certified Network Associate (CCNA)
Cisco Certified Design Associate (CCDA)
Certified Lotus Specialist (CLS) with A-Plus Certificate [CompTIA]
Systems Security Certified Practitioner (SSCP) [Computer Security Institute (CSI)]
Information Systems Security Assoc. (ISSA)
GIAC Security Essentials Certification (GSEC) and one of the following:
 GIAC Certified Windows Security Administrator (GSWN)
 GIAC Certified Information Security Officer (GISO) GIAC Systems and Network Auditor (GSNA)