Executive Summary

Clinger-Cohen Assessment Survey (2003)

For the Governmentwide Information Technology (IT) Workforce

Purpose

The Clinger-Cohen Assessment (CCA) Survey, conducted during September 2003, satisfied the Clinger Cohen Act requirement for an annual workforce assessment. Additionally, it satisfied the Office of Management and Budget (OMB) requirement for an information technology (IT) workforce assessment as outlined in agency passbacks for Budget Year 2004. Finally, the CCA survey also addressed Section 209 of the E-Government Act by analyzing the personnel needs of the Federal Government relating to information technology and information resources management. The survey responses provided Government-wide and Agency-specific inputs to human capital planning efforts.

Background

The Federal Chief Information Officer's Council (CIOC) Workforce and Human Capital for IT Committee developed the survey to help determine areas of needed competency development, and to initiate the first stages of strategic workforce planning. A CIOC working group evaluated available tools and technologies to perform such a survey. Key goals were to be able to use established, recognized competencies and to develop the survey quickly with minimal resources to meet the OMB requirement. The working group opted to develop the survey based on the competency-based approach of the GS-2210 IT Management occupational series as outlined in the IT Workforce Development Roadmap, a web-based career development tool also developed by the CIOC.

During August 2003, the CIOC worked with the Office of Personnel Management (OPM) and the OMB E-Gov office to develop the survey questions and content areas (competencies, skills, certifications, and specialized job activities). The competencies were a subset of the general and technical competencies developed by OPM for the GS-2210 IT Management occupational series. Subject matter experts from various government agencies chose the skills, certifications and specialized job activities.

Methodology

The CCA survey was conducted via the Internet, with participants notified by a designated contact from their respective agency. Agency contacts were advised to notify their IT workforce to complete the survey based on their occupational series (everyone in the traditional IT-related series such as GS-2210 IT Management, GS-391 Telecommunications, and GS-1550 Computer Science as well as those individuals in non-

traditional IT-related series such as GS-301 Miscellaneous Program and Administration, GS-340 Program Management, and GS-343 Management and Program Analysis, but only if they perform IT-related work).

Once notified that the survey commenced, respondents visited the survey website and selected and submitted the most appropriate answers to questions organized in five major parts: Demographics, Competencies, Skills, Specialized Job Activities, and Certifications.

Respondents generally took between 15 and 20 minutes to complete the survey. A dynamically generated set of frequently asked questions helped respondents with technical and survey-related issues.

The survey was voluntary and open to the entire Federal IT workforce. Because the survey was voluntary, the sample collected was self-selecting, not random. In addition, the survey was anonymous. No information regarding the identity of the actual user was collected. This was done to ensure maximum participation.

Key Results

Response Rate

The total number of responses at the aggregate Federal level, along with the estimated Federal IT workforce population and response rate, is provided in the table below.

Estimated Federal IT Population Size	Number of Responses	Overall Survey Response Rate
76,363	19,827	25.96%

Demographics

Based on the frequency of responses to the demographic survey questions, a profile of the "typical" IT worker emerges. This profile represents the most frequent number of responses for each pertinent demographic question.

The "Typical" IT Worker most often…
…is between 46 and 50 years of age
…is a GS-13 (or FS-3 for Foreign Service)
…has over 20 years of Federal Government experience
…has little to no private sector experience
…is likely to retire in the next 10 to 20 years
…is fairly mobile (may leave their organization in the 3 years)
…holds a Bachelor's Degree

Competencies

The survey asked respondents to provide a self-assessment of current proficiency in a set of 53 technical and 16 general competencies, which are a subset of those developed by OPM for the GS-2210 IT Management and other occupational series. Respondents assessed their current proficiency using a six-point rating scale (with 0 lowest and 5 highest). The tables below list the top 10 technical and general competencies based on the combined percentage of responses in the Intermediate, Advanced and Expert proficiency levels.

Technical Competency	% Intermediate or Greater Proficiency	Rank
Hardware	66.93%	1
Configuration Management	64.87%	2
Operating Systems	64.04%	3
Technical Documentation	58.48%	4
Data Management	58.25%	5
Knowledge Management	58.07%	6
Technology Awareness	58.02%	7
Project Management	57.92%	8
Computer Languages	56.11%	9
Standards	55.60%	10

General Competency	% Intermediate or Greater Proficiency	Rank
Interpersonal Skills	90.46%	1
Problem Solving	89.35%	2
Customer Service	84.41%	3
Decision Making	84.36%	4
Oral Communication	83.98%	5
Leadership	80.99%	6
Planning and Evaluation	80.45%	7
Organizational Awareness	79.52%	8
Influencing/Negotiating	71.30%	9
Administration and Management	60.57%	10

Skills

Respondents also provided a self-assessment of their current proficiency in a set of more specific IT-related skills. Subject matter experts chose these vendor-neutral skills (a total of 80) based on their applicability to various IT occupations. Respondents assessed their current proficiency using a four-point rating scale (with 0 lowest and 3 highest; differing from the five-point scale used for competencies). The table to the right lists the top 20 skills based on the combined percentage of responses in the Intermediate and Advanced proficiency levels.

Skill	% Intermediate or Greater Proficiency	Rank
Word Processing Software	78.39%	1
Electronic Mail	73.12%	2
Spreadsheet Software	59.73%	3
Internet Browsers	54.44%	4
File systems	54.15%	5
Flowcharting	53.07%	6
Browsers	52.84%	7
Client-Server	50.86%	8
Understanding and translating user requirements	50.35%	9
Desktop Services	48.86%	10
Data Flow Diagrams	48.15%	11
Data Analysis	47.94%	12
Document Management	45.04%	13
Desktop Publishing Software	43.78%	14
Programming Concepts	43.74%	15
Systems Security and User Administration	42.52%	16
Communications Software	42.41%	17
Storage Devices	39.69%	18
HTML	39.56%	19
Cabling	39.14%	20

Specialized Job Activities

Respondents estimated the amount of time they spend on a daily basis (as part of their normal duties and responsibilities) on ten different "specialized job activities" using a rating scale of "Extensive," "Moderate," and "Minimal or none." The table on the following page ranks the ten specialized job activities based on the combined proportion of responses for the "Extensive" and "Moderate" time variables.

By aligning competencies, skills and certifications to the amount of time individuals spend on specialized job activities, one can infer if there are adequate skills/competencies given the workload (inferred by time spent) or if there are gaps in specific areas – especially for the activities ranked highest overall in terms of time spent on the activity (e.g., IT Project Management, IT Security/Information Assurance).

The Federal CIO Council worked with subject matter experts from various agencies to define the relationships between activities and competencies, skills and certifications. In some cases, the top 5 to 6 competencies and skills were chosen for subsequent analysis. These relationships were not meant to be all-inclusive but were meant to be generic and apply to the IT workforce in general; it is assumed that individual Departments/Agencies, through their own analysis, may chose different relationships to reflect their environment or mission needs.

Activity Name	Time Variable	% of Responses	# Responses	Rank
IT Project Management	Extensive	22.37%	4436	1
	Moderate	36.98%	7332	
	Minimal or none	40.64%	8058	
IT Security/Information Assurance	Extensive	14.64%	2903	2
	Moderate	33.91%	6723	
	Minimal or none	51.45%	10200	
Knowledge Management	Extensive	8.47%	1679	3
	Moderate	32.28%	6400	
	Minimal or none	59.25%	11747	
IT Workforce Management/Development	Extensive	11.89%	2358	4
	Moderate	27.06%	5364	
	Minimal or none	61.05%	12104	
Records Management	Extensive	7.54%	1495	5
	Moderate	26.96%	5345	
	Minimal or none	65.50%	12986	
Privacy	Extensive	5.64%	1118	6
	Moderate	23.27%	4613	
	Minimal or none	71.09%	14095	
Enterprise Architecture (EA)	Extensive	6.35%	1259	7
	Moderate	20.73%	4110	
	Minimal or none	72.92%	14457	
Solutions Architecture	Extensive	6.99%	1385	8
	Moderate	19.83%	3931	
	Minimal or none	73.19%	14510	
E-Government	Extensive	4.74%	939	9
	Moderate	20.80%	4123	
	Minimal or none	74.47%	14764	
Capital Planning and Investment	Extensive	5.66%	1123	10
	Moderate	19.33%	3832	
	Minimal or none	75.01%	14871	

Certifications

Respondents indicated broad areas in which they possess a recent (past three years) certification. The survey purposely avoided asking for specific certifications and instead focused on certification areas because a reliable list of certifications is difficult to compile. The survey distinguished between certifications validated by an independent authority, which included experience as part of the requirements, and certificates offered by vendors upon completion of coursework. Therefore, respondents were instructed to indicate only certification areas that included experience as part of the certification criteria. The table below lists the ten most frequently selected certification areas, based on the total number of responses and the resulting percentage of the total IT workforce.

Certification Area	# Certified	%	Rank
IT Related Technical Certificates from accredited Technical Schools (military or commercial)	1960	9.89%	1
Microsoft	1897	9.57%	2
Comp TIA	869	4.38%	3
Cisco	729	3.68%	4
Novell	653	3.29%	5
Information Systems Security	633	3.19%	6
Project Management	542	2.73%	7
Network Security	391	1.97%	8
Oracle	385	1.94%	9
Information Systems	350	1.77%	10

Conclusions

The *Clinger-Cohen Assessment Survey (2003) Analysis of Survey Results* provides conclusions based on a detailed analysis of the survey responses. Some conclusions in the report include:

- There appears to be an aging IT workforce with few younger individuals to replace the older ones. For example, approximately 76% of the IT workforce responded that they are older than 40, while roughly 5% indicated they were under 30 years old. Although the workforce is aging, it appears that some of those closest to retirement (0 – 3 years) do not plan on retiring when they are eligible.

- Based on self-assessments, competency proficiencies were rated higher than skill proficiencies. This could reflect that the workforce, in general, is equipped to handle complex jobs/activities without the need to understand how a particular technology works. It could also mean that the work is less operationally-focused, so skills may not be as central to the job as competencies. It is also possible that the workforce has not been given the opportunity (through training, certification, etc.) to stay abreast of skills related to rapidly changing technologies, or the skills may be related to functions that are typically outsourced.

- Very few respondents were certified in any given area. Generally, more respondents are certified in "holistic" areas (e.g., Project Management, CIO) versus technology-specific ones (e.g., DCG Mux, Lucent, Linux).

- Certain competencies (Capital Planning and Investment Assessment, Contracting/Procurement, and Financial Management) and skills (Federal/OMB Enterprise Architecture, Biometrics, Portal Development) that relate to high-priority specialized job activities, as well as the evolving mission needs of the Federal Government, may need development.

Recommendations and Lessons Learned

The *Clinger-Cohen Assessment Survey (2003) Analysis of Survey Results* provides recommendations and lessons learned, which include:

- The CIOC Workforce and Human Capital for IT Committee should work with the OPM Human Capital Leadership and Merit System Accountability (HCLMSA) Division and the Chief Human Capital Officer's (CHCO) Council to develop a Governmentwide IT workforce Strategic Human Capital Plan to build capacity and fill skills gaps, understanding that the CCA survey results form the "as is" state. A "to be" state would need to be identified to allow for comparisons between the two, resulting in a "gap analysis" and the formulation of gap mitigation strategies.

- The CIOC Workforce and Human Capital for IT Committee should work with the CIOC Federal Architecture and Infrastructure Committee (AIC) to incorporate human capital elements into the Federal Enterprise Architecture

(FEA). Human capital elements should be added to the Business Reference Model of the FEA as an enhancement to the Human Resource Management activity. This will focus agencies on this critical aspect of resource planning and management.

- The CIOC Workforce and Human Capital for IT Committee, working with OPM, should further develop an integrated IT workforce career development program. There are pieces of this program already developed or in process, including the IT Workforce Development Roadmap, the IT Exchange Program, and mentoring programs. The parts should be integrated into a more cohesive "whole." Implementing targeted incentive programs that would facilitate mobility between the public and private sector should also be considered.

- The CIOC Workforce and Human Capital for IT Committee should evaluate the need for and consider providing structure and potential guidelines for the types of experience, credentials and certification important for successful performance in certain mission critical IT occupations.

- Agencies should identify pockets of expertise (e.g., IT Project Management) and devise knowledge management strategies and methods to capture and share knowledge of the current and departing IT workforce within and between agencies.

- Agencies should utilize Government-funded central resources (e.g., the Gov Online Learning Center) as a way to create economies of scale in providing training opportunities for the IT Workforce.

- Agencies should convert all remaining Computer Specialists, GS-0334s, to the Information Technology Management, GS-2210 series. The Computer Specialist GS-0334 series was abolished in May 2001 and replaced by the IT Management GS-2210 series, a part of the Job Family Position Classification Standard for Administrative Work in the Information Technology Group, GS-2200. Converting the remaining Computer Specialists to the appropriate parenthetical titles within the IT Management series will provide a more accurate reflection of the Federal IT workforce.