



**Report of the
ITAA Blue Ribbon Panel
on IT Diversity**

**Presented at the
National IT Workforce Convocation
May 5, 2003 - Arlington, VA**

Executive Summary

This study produced by the Information Technology Association of America (ITAA) Blue Ribbon Diversity Panel finds that racial minorities and women made few inroads into high tech employment between 1996 and 2002, based on an analysis of data from the U.S. Bureau of Labor Statistics' (BLS) Current Population Surveys. This report represents an update to a previous ITAA report, released in 1998, examining the same topic. The data are preceded by a discussion of barriers to entry in IT and suggests solutions to the challenge for industry, government and education stakeholders to consider.

The report finds that the percentage of women in the overall IT workforce fell from 41% to 34.9% between 1996 and 2002, and the percentage of African Americans in the overall IT workforce fell from 9.1% to 8.2% during the same period. However, when administrative positions were removed from consideration, the percentage of women IT professionals rose from 25% to 25.3% of the workforce and the percentage of African American IT professionals also rose slightly from 6% to 6.2% between 1996 and 2002.

While these small gains have been made in the number of women and minorities working as IT professionals, the groups still are underrepresented in the IT workforce as compared to their participation in the general U.S. workforce. Women comprised 46.6% of the U.S. workforce and African Americans represented 10.9% of the U.S. workforce in 2002.

Hispanic Americans, Native Americans and Asian Americans made gains in the IT Workforce. Hispanic Americans comprised 5.4% in 1996 and 6.3% in 2002; Native Americans jumped from .2% to .6%; and Asian Americans rose from 8.9% to 11.8% in the same period.

Additional findings are:

- Women earned only 22% of computer science and engineering undergraduate degrees in 2000. African Americans earned 7%, Hispanics 5% and Native Americans 1% of degrees.
- Hispanic Americans and Native Americans, like women and African Americans, are also underrepresented in the IT workforce, as compared to their overall workforce participation. Hispanics made up 6.3% of the IT workforce but 12.2% of the U.S. workforce in 2002, while Native Americans are .6% of the IT workforce and .9% of the U.S. workforce.
- Hispanic Americans working in non-administrative positions as IT professionals, like African Americans and Women, also made gains between 1996 and 2002, jumping from 3.4% to 5% of IT pros.
- Asian Americans are nearly three times as prevalent in the IT Workforce than they are in the overall U.S. workforce.
- Americans over 45 are also under represented in the IT workforce. In 2002 they were 29.4% of the IT workforce compared to 37.6% of the U.S. workforce overall.

Introduction

ITAA convened a Blue Ribbon Diversity Panel¹ on the IT Workforce in Fall 2002 to assess the progress being made by women, African Americans, Hispanic Americans, Native Americans, older workers and persons with disabilities in the high tech workforce today. The Panel reviewed existing data from government sources, discussed potential existing barriers to entry for underrepresented groups into IT, and put forth solutions for companies and hiring organizations to consider in order to improve the representation of these groups in IT, as well as encourage career growth.

This 2003 report builds on past work done by ITAA on IT diversity. In 1998, ITAA developed a Task Force Report on Underrepresented Groups that was issued at the Association's National IT Workforce Convocation in Berkeley, California. ITAA also partnered with U.S. Black Engineer and IT Magazine on a diversity survey in 2001. During this same year, ITAA launched its Digital Opportunity Initiative, which provided talented minority students with internship opportunities at major IT companies.

The current report represents the findings of the ITAA Blue Ribbon Diversity Panel and, when possible, compares data from ITAA's 1998 Task Force Report (which contained data collected in 1996) to show improvement and, in some cases, retraction. Prior to the discussion of the data, the report presents various hypotheses on barriers to entry into the IT profession and proposes possible solutions to stakeholders— government, education, industry and workers--on how to increase diversity in the U.S. IT workforce. In addition, the report highlights corporate best practices being instituted to overcome the lack of diversity in the technology industry.

¹ See Appendix I for list of panel members.

The IT Workforce: Possible Barriers to Entry

The dilemma of underrepresentation cannot be isolated to a single factor or barrier that prevents women and underrepresented groups from entering the IT workforce. It is the opinion of the ITAA Blue Ribbon Diversity Panel that there are multiple factors contributing to the relative lack of diversity in IT. The Panel agreed that the following major barriers exist:

I. Lack of Role Models and Networking Opportunities

Underrepresentation of women and minorities in IT leads to the inevitable “vicious cycle” of fewer professional role models for those who wish to enter the IT profession. The Panel believes that the scarcity of adequate role models and mentors has a direct correlation to the perceptions that female and minority candidates will develop about IT. These candidates may tend to view the profession as lonely and isolated or may find assimilation into mainstream networks of companies difficult due, in part, to a lack of common interests or a sense of just not belonging.

Networking groups such as Women in Technology (WIT), the Black Data Processing Associates (BDPA), and the National Action Council for Minorities in Engineering (NACME)², do an admirable job in bringing IT professionals together; however, the reality remains that there are not enough mentors and role models to advise and welcome aspiring IT professionals.

II. Information Gap

Why are women and minorities are earning fewer computer sciences and engineering degrees than their white male counterparts? An information gap about the necessary academic requirements for different IT degrees may be the reason. For example, math is the language of engineering, and yet many students are simply not taking enough math and science courses in the middle and high schools to prepare them for rigorous college degree courses that are requisite for the IT profession.

Evidence suggests that while children like math, their schools do not offer enough courses that teach it. A 1999 Harris Interactive study of 2,100 school children commissioned by NACME³ showed math to be the favorite subject, with 28% of students choosing math. The same study found that 65% of minority boys and 74% of minority girls said they wanted to take advanced math courses, but only 45% of the boys and 46% of the girls said their schools offered advanced math courses⁴. This data suggests that teachers and career counselors, particularly in middle and high school settings, may not understand or appreciate the requisites to prepare students for careers in IT.

Because teachers and, specifically, guidance counselors may have limited and inaccurate information about the IT industry, the skills and knowledge required for success, and the

² See Appendix III for a resource list

³ See NACME Journal 2001-2002, “The State of Minorities in Engineering and Technology” pages 40-44.

⁴ Ibid.

academic foundations needed to support those skills, students may be also unable to translate the education and technology skills learned and practiced in their academic classes into IT skills required in the workforce.

The ITAA Diversity Panel believes that an opportunity exists for policy makers and educators to work together to achieve higher penetration in the schools of advanced math and science courses, with a particular focus on underserved and low-income areas. Additionally, the Panel recognizes the importance of making appropriate connections between academic and technical education that will help students integrate into a knowledge society where IT is a major component.

The “Digital Divide” – or the relative lack of information technology, computer and Internet access for low income and minority groups – may also adversely affect the amount of information and knowledge imparted to minority groups. This lack of information access may hinder an understanding of the opportunities available to math and science majors in lucrative and rewarding IT careers.

III. The IT Environment Does Not Appear Attractive

Information technology (IT) is often portrayed in movies and books as a solitary and anti-social profession, dominated primarily by young, white males. The phrases “computer geek” or “computer nerd” are well entrenched in the popular culture. These images certainly ignore the fact that software is often developed in teams, in highly collaborative settings, where intellect and motivation are most likely to determine one’s standing with both peers and managers. Still, these negative images of the inept technophile may be another barrier that may be deterring females and minorities from the high tech industry. Females and minorities may feel isolated or unaccepted in the IT profession and, therefore, may choose other career fields that are less technical or sectors where there are greater numbers of minorities.

In addition, the ITAA Panel believes that because the IT environment may consist of long, irregular work hours as well as fair amounts of volatility, women constrained by their roles as working mothers may be disadvantaged in this kind of work setting and unable to perform to expected time commitments.

According to the American Association of University Women's (AAUW) report, *Tech Savvy: Educating Girls in the New Computer Age*, the image of IT as a masculine industry may be causing many girls to reject IT as a viable career choice. The AAUW report states:

*"The cultural emphasis on technical capacity, speed, and efficiency when discussing computers estranges a broad array of learners, many girls included, who do not identify with the wizardry of computer aficionados and have little interest in the purely technical aspects of the machines...the computer culture has become linked to a characteristically masculine worldview, such that women too often feel they need to choose between cultural associations of 'femininity' and those of 'computers'."*⁵

⁵ See AAUW's *Tech Savvy: Educating Girls in the New Computer Age*, page 7.

In addition to girls who may be turned off to computers, other minority groups may also feel uncomfortable with the "computer culture" described in the AAUW report.

IV. Lack of Strong Corporate Commitment

While it is impossible to make sweeping generalizations about the commitment of the IT industry as a whole to diversity, concerns remain that companies need to do more to reach out to women and minorities. Specifically, the Panel believes that companies should demonstrate consistent and proactive approaches to attracting, retaining, and promoting qualified women and minority candidates in IT. Without serious leadership from IT employers, many minority applicants may choose other occupational fields.

V. Stereotypes that May Impede Hiring and Advancement Opportunities

In addition to the image challenges that face the IT industry, there are also limiting stereotypes that may affect the hiring and promotion of underrepresented groups. Among the negative stereotypes is the belief that certain minorities are not proficient in math and science and, consequently, not steered toward academic study in these areas. Some evidence of this possible perception is captured in a 1998 Bayer Facts of Science Education IV report. The Bayer study, which surveyed more than 1400 male and female Ph.D scientists who are members of the American Association for the Advancement of Science (AAAS), found distinct differences in responses based on gender. For example, at the high school level, 45% of female scientists believe girls were encouraged less than boys in science, compared to 28% of the males. Thirty-nine percent of female scientists believe girls were encouraged less than boys in science in elementary school, compared to 25% of the males. While the Bayer survey does not specifically address stereotypes, it does suggest how varying perceptions can possibly impact the ways girls and boys are guided in science. The Diversity Panel believes that attitudes like this could also possibly impede the career progress of some minorities who do not receive the proper mentoring.

Diversifying the IT Workforce: Solutions to Addressing Barriers

To address the barriers facing underrepresented groups, the ITAA Diversity Panel proposes these three major solutions for improving diversity within the IT industry:

I. Stronger Commitment from Corporate Leadership

The Panel believes that improvements in the profile of the IT profession should begin with the company CEO. Until CEOs hold themselves and their executive management teams accountable for improving the number of women, minorities, disabled and older workers that are employed in the IT function, including executive management positions, questions will linger. This commitment entails setting hiring, promotion, and retention objectives for the profile of females and minorities in the IT ranks. One possible solution offered by the Panel included having CEOs put some component of compensation at risk for individual executives to improve the diversity profile.

II. Increased Corporate Outreach and Mentoring

Companies must plug into the IT professional forums that bring together the diverse members of the profession. Specifically, these forums should be those minority organizations that provide development and advocacy support, such as Black Data Processing Associates (BDPA), Women in Technology (WIT), National Association of Female Executives (NAFE), the Society for Hispanic Professional Engineers (SHPE), and others.

The Panel believes that IT employers can tap into these valuable forums by encouraging their minority workers to be members, by paying their membership dues, and by supporting specific activities such as diversity career fairs and networking events. Companies can also gain access to a pool of potential IT talent that may have been previously ignored or overlooked through these groups.

III. Foster Stronger Partnerships Between IT Companies and Colleges and Universities

Companies involved in an "adopt-a-school" approach with a college or university generally get priority access to a large pool of qualified IT graduates. However, the ITAA Panel recommends that IT firms commit to forging stronger alliances with these institutions that go beyond the placement of a few college graduates. In addition to providing financial support, companies should also consider such targeted activities as providing endowed chairs, academic faculty internships, student internships, curriculum advisement, adjunct instruction, employee volunteers for community-based organizations, and support for community technology centers.

Industry partnerships with minority-serving institutions are particularly important for increasing the presence of underrepresented groups in the workforce. For example, the role of Historically Black Colleges and Universities (HBCUs) has become pivotal in the education of African-Americans in science and engineering. According to a 1999 report from the Commission of Professionals in Science and Technology (CPST), HBCUs comprised only 4% of all four-year colleges and universities, yet they conferred over 28% of all bachelor's degrees earned by African-Americans, and nearly 31% of those in science and engineering.⁶ Clearly, minority-serving institutions like HBCUs are a valuable resource for companies to recruit, attract, and hire minority talent.

The Panel also recognizes the need for companies and schools to work together in creating partnerships that honor the contributions of each other. Specifically, these alliances should highlight the strengths of the industry and education partners involved and include accurate information sharing about skill development and employer expectations in the workforce.

In addition to the primary interventions described above, the Panel also proposes developing a national clearinghouse of best practices in the following areas: recruitment of IT professionals, training for newly hired minority applicants, and retention strategies

⁶CPST, *Up Hill Climb: The Status of African-Americans in Science and Technology*, 1999, page 6.

specifically targeted to CEOs and human resource executives to help them better develop and retain minority talent.

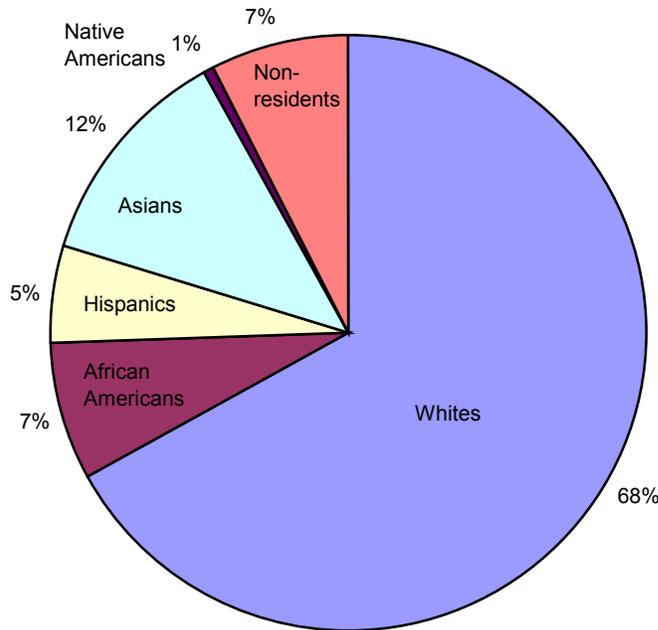
DATA PROFILE:

Growing the Pipeline – Women, Racial and Ethnic Minorities Receiving Undergraduate Degrees in Computer and Related Fields

The IT industry, even in the economic slowdown of 2003, is an industry of higher-than-average paying jobs. This sector is also, by and large, a field of highly technical expertise and requires education and background in mathematics, science, and technology before candidates can even become eligible for many positions. Degrees in computer science, engineering and engineering related fields are among the most common requirements for job positions.

In the 1999-2000 academic years, the number of college graduates nationwide with degrees in computer science, engineering or an engineering related field was 108,494. Of those graduates, 68% were White; 7% were African American; 5% were Hispanic; 12% were Asian American and 1% was Native American (see Chart 1). Additionally, U.S. colleges and universities conferred as many computer science and engineering degrees on non-resident aliens as it did to African-Americans in 2000, and more than any other native born ethnic or racial minority.⁷ Chart 1 illustrates the breakdown of degrees conferred.

Chart 1: Undergraduate Degrees In Computer Science, Engineering and Engineering Related Technologies, 1999-2000



⁷ Source: U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “Completions” survey, prepared July 2001.

Similar data show that women received 22% of undergraduate degrees in the computer science and engineering related fields. This percentage has not changed since ITAA's 1998 report, when women also earned 22% of all degrees in Computer Science and Engineering. The 1998 ITAA report did not break down the available data into race categories within the genders.

Data on Women in the IT Workforce

Table 1: Representation of Women in the IT Workforce versus Overall Workforce (1996 and 2002) -

| | 2002 Total | 2002 | 2002 | 1996 | |
|--|-------------------------|-------|---------|-------|---------|
| | Employed (thousands) | % Men | % Women | % Men | % Women |
| Electrical and electronic engineers | 677 | 89.7 | 10.3 | 92 | 8 |
| Computer systems analysts and scientists | 1,742 | 72.2 | 27.8 | 72 | 28 |
| Operation and systems researchers and analysts | 238 | 51.3 | 48.7 | 57 | 43 |
| Computer programmers | 605 | 74.4 | 25.6 | 69 | 31 |
| Computer operators | 301 | 53.2 | 46.8 | 40 | 60 |
| Data entry keyers | 595 | 18.3 | 81.8 | 15 | 85 |
| | | | | | |
| Total IT occupations | 4,158 | 65.1 | 34.9 | 59 | 41 |
| All Occupations | 136,485 | 53.4 | 46.6 | 54 | 46 |

Source: Bureau of Labor Statistics

Women represented nearly 35% of the overall IT workforce of 4,158,000 in 2002, according to data from the Bureau of Labor Statistics (BLS). This is a full eleven percentage points below the percentage of women in the overall workforce, which stood at 46.6% in 2002. Table 1 shows that in 1996, women were 41% of the IT workforce. However, in 1996, the higher percentage was due largely to greater numbers of women in the administrative IT positions of Data Entry Keyers and Computer Operators. Typically, these jobs require less formal education and experience, and command demonstrably lower pay than other positions listed in this BLS category.

By removing the Data Entry Keyers and the Computer Operator positions from the 2002 data set entirely, the percentage of women IT Professionals drops to 25.3% of the 3,563,000 IT workers. This figure is up slightly from 1996, when women comprised 25% of the IT workforce when Data Entry and Computer Operator fields were removed.

Data on Racial and Ethnic Minorities in the IT Workforce

Table 2: Percentage by Race in the IT Workforce and in Overall Occupations (1996 and 2002)

| | 2002 | | | | | 1996 | | | |
|--|-------|------------------|---------------------------|--------|----------|-------|------------------|----------|--------------------------|
| | White | African American | Asian or Pacific Islander | Indian | Hispanic | White | African American | Hispanic | Other Races ⁸ |
| Electrical and electronic engineers | 81.1 | 5.9 | 10.8 | 0.6 | 4.0 | 85.9 | 4.5 | 3.8 | 9.7 |
| Computer systems analysts and scientists | 76.3 | 6.9 | 14.4 | 0.5 | 5.2 | 81.7 | 7.2 | 2.5 | 11.1 |
| Operation and systems researchers and analysts | 78.6 | 10.5 | 8.4 | 0.8 | 5.5 | 86.1 | 8.1 | 3.3 | 5.7 |
| Computer programmers | 75.5 | 4.0 | 17.5 | 0.3 | 5.0 | 84.0 | 5.3 | 4.6 | 10.7 |
| Computer operators | 82.4 | 12.0 | 5.0 | 0.3 | 8.3 | 83.4 | 13.3 | 7.8 | 3.3 |
| Data entry keyers | 77.5 | 16.1 | 4.7 | 1.0 | 12.6 | 78.1 | 17.0 | 10.8 | 4.9 |
| Total IT occupations | 77.7 | 8.2 | 11.8 | 0.6 | 6.3 | 82.5 | 9.1 | 5.3 | 8.4 |
| All occupations | 83.5 | 10.9 | 4.0 | 0.9 | 12.2 | 85.1 | 10.7 | 9.2 | 4.2 |

Source: Bureau of Labor Statistics, Current Population Surveys, 1996 and 2002 annual averages

NOTE: Percentages for the above race and Hispanic-origin groups will not sum to 100 percent because data for Hispanics are included in the race categories of White and African American.

Table 2 shows Whites comprise 77.7% of the current IT workforce, while they make up 83.5% of the overall US workforce. African Americans are 8.2% of the IT workforce but 10.9% overall; Native Americans are .6% of the IT workforce and .9% of overall workers; and Hispanics are 6.3% of IT and 12.2% overall.

While these numbers show the underrepresentation of certain groups in the IT workforce, the gains made by some since 1996 are also important to note. For example, the percentage of Hispanics is up from 1996, when this group represented 5.3% of the IT workforce. The percentage of African Americans in the IT workforce is down from 9.1% in 1996 to 8.2% in 2002.

The only racial group that consists of a higher percentage of IT workers than the percentage of workers in all occupations is Asian and Pacific Islanders, who make up 11.8% of the IT workforce but only 4% of the U.S. workforce, according to the 1996 data from ITAA.

⁸ 1996 BLS data did not break out other races, so data for comparison is not available.

Table 3: Number of IT Workers by Race (in thousands) 2002

| | Total Employed | White | African American | Asian or Pacific Islander | Amer. Indian | Hispanic |
|---|-------------------|---------|---------------------|---------------------------------|-----------------|----------|
| Electrical and electronic engineers | 677 | 549 | 40 | 73 | 4 | 27 |
| Computer systems analysts & scientists | 1,742 | 1,330 | 120 | 250 | 8 | 90 |
| Operation and systems researchers and analysts | 238 | 187 | 25 | 20 | 2 | 13 |
| Computer programmers | 605 | 457 | 24 | 106 | 2 | 30 |
| Computer operators | 301 | 248 | 36 | 15 | 1 | 25 |
| Data entry keyers | 595 | 461 | 96 | 28 | 6 | 75 |
| | | | | | | |
| Total IT occupations | 4,158 | 3,232 | 341 | 492 | 23 | 260 |
| | | | | | | |
| All occupations | 136,485 | 114,013 | 14,872 | 5,481 | 1,171 | 16,590 |

Source: Bureau of Labor Statistics, Current Population Surveys, 2002 annual averages

NOTE: Percentages for the above race and Hispanic-origin groups will not sum to 100 percent because data for Hispanics are included in the race categories.

Again, removing the administrative fields of Data Entry and Computer Operator reveals that the percentage of African Americans is 6.2%, up slightly from 6% of IT Professionals in 1996.

The percentages of Hispanics and Native Americans also fall to 5% and .5%, respectively, when factoring out administrative positions. The percentage of Hispanic IT professionals has made a net gain of 1.6% in 2002 from 3.4% in 1996. It is important to note that the 1996 data on Native Americans in the IT workforce was derived from the National Science Foundation (NSF) and not BLS data, so making direct comparisons between these two data sets are difficult. In ITAA's 1998 report, Native Americans in the Science and Engineering Labor Force was .2% (NSF), and in 2002, the percentage in Computer and Engineering fields was .6% (BLS). In spite of differences in the data sources, slight improvements for Native Americans in the IT workforce should be noted. While factoring out administrative positions causes all percentages except for those of Asian Americans and Pacific Islanders to fall, it is important to note that the percentages of African American IT Professionals, Women IT Professionals and Hispanic IT Workers and IT Professionals have risen, albeit marginally, since 1996.

Table 4: Underrepresented Groups in the IT Workforce (1996 versus 2002)

| | 1996 | 2002 | 1996 | 2002 |
|--------------------------|--------------|--------------|------------------|------------------|
| | IT Workforce | IT Workforce | IT Professionals | IT Professionals |
| Women | 41% | 34.9% | 25% | 25.3% |
| African American | 9.1% | 8.2% | 6% | 6.2% |
| Asian / Pacific Islander | 8.9%* | 11.8% | N/A | 13.4% |
| Hispanic | 5.4% | 6.3% | 3.4% | 5% |
| Native America | .2%* | .6% | N/A | .5% |

*Note: 1996 data on Asian and Native American workers in the IT Workforce are from the National Science Foundation. All other data are from the Bureau of Labor Statistics.

Comparing the 1996 and 2002 data on women and ethnic minorities shows good news: that overall, women, African Americans, and Hispanics are making gains in their numbers in the IT workforce, particularly among the IT professional workforce. In each case, however, IT workers are significantly below the percentage of these groups in all occupations.

Data on Persons with Disabilities⁹ in the IT Workforce

BLS current population data do not track persons with disabilities by occupation. But the data from the National Science Foundation’s comprehensive report, *Women, Minorities and Persons with Disabilities in Science and Engineering 2000*, reports that between 1993 and 1997, the percentage of persons with disabilities in the Science and Engineering Labor force hovered around five percent.

Table 5: Percentage Distribution of Scientists and Engineers in the Labor Force by Disability Status

| | 1993 | 1995 | 1997 |
|------------------------------|-------|-------|-------|
| Persons With Disabilities | 5.1% | 4.9% | 5.6% |
| Persons Without Disabilities | 94.9% | 95.1% | 94.4% |

Source: National Science Foundation / Division of Science Resources Studies, 1997 SESTAT (Scientists and Engineers Statistical Data Systems)

This was similar to the data presented in the 1998 ITAA report, also from the National Science Foundation, which indicated 5.8% of the Science and Engineering Labor force was disabled. It is not clear, however, what year this data was compiled.

⁹ The National Science Foundation’s surveys used a functional definition of disability patterned after one developed for a survey of individuals with disabilities by the Census Bureau. This measure was based by asking individuals, “What is the USUAL degree of difficulty you have with [specific tasks involving seeing, hearing, walking, and lifting?]” Respondents were given five choices for each item ranging from “none” to “unable to do.” Having a disability for this data set is defined as having at least moderate difficulty in performing one or more of these tasks. See the NSF report, *Women, Minorities and People with Disabilities in Science and Engineering 2000*, page 53 for further details on the definition.

Data on Older Workers in the IT Workforce

In 2002, 61.8% of the U.S. IT workforce fell between the ages of 25-44 (Table 6). Across all occupations, that percentage is 48%. The number of IT workers starts to drop off after 45, with only 8.4% of workers ages 55 years and older, as compared to 14.7% of the overall workforce.

Table 6: Percentage of Workers by Age in the IT Workforce, 2002

| | Total employed | 16-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65+ |
|--|-------------------|-------|-------|-------|-------|-------|-------|-----|
| Electrical and electronic engineers | 677 | 0.1 | 5.0 | 25.1 | 35.5 | 25.3 | 8.1 | 0.7 |
| Computer systems analysts and scientists | 1,742 | 0.3 | 5.7 | 37.4 | 30.5 | 19.3 | 6.2 | 0.6 |
| Operation and systems researchers and analysts | 238 | 0.4 | 5.9 | 28.6 | 28.6 | 23.9 | 11.3 | 1.3 |
| Computer programmers | 605 | 0.8 | 6.8 | 38.2 | 29.1 | 18.8 | 5.8 | 0.5 |
| Computer operators | 301 | 2.7 | 12.0 | 25.2 | 26.2 | 23.3 | 8.0 | 2.7 |
| Data entry keyers | 595 | 5.2 | 15.3 | 22.9 | 23.5 | 21.0 | 9.9 | 2.4 |
| Total IT occupations | 4,158 | 1.2 | 7.6 | 32.1 | 29.7 | 21.0 | 7.4 | 1.0 |
| All occupations | 136,485 | 4.6 | 9.8 | 22.2 | 25.8 | 22.9 | 11.5 | 3.2 |

Source: Bureau of Labor Statistics, Current Population Surveys, 2002 annual averages

Compared to 1996, workers 25-44 years olds comprised 64.8% of the IT workforce (Table 7). At that time, the percentage across all occupations was 53%. In 1996, 6.8% of the IT workforce was over 55, compared to 12.2% of workers in all occupations.

Table 7: Percentage of Workers by Age in the IT Workforce, 1996

| | Total | 16-19 | 20-24 | 25-34 | 35-44 | 45-54 | 55-64 | 65 and over |
|---|-------|-------|-------|-------|-------|-------|-------|-------------|
| Electrical and Electronic Engineers | 100.0 | 0.2 | 3.2 | 32.6 | 34.3 | 20.1 | 8.7 | 1.0 |
| Computer Systems Analysts and Scientists | 100.0 | 0.4 | 5.1 | 35.1 | 34.6 | 20.0 | 4.4 | 0.3 |
| Operations and Systems Researchers and Analysts | 100.0 | 0.0 | 2.9 | 33.5 | 30.1 | 25.4 | 5.7 | 1.9 |
| Computer Programmers | 100.0 | 0.9 | 7.3 | 42.8 | 28.9 | 15.9 | 4.1 | 0.2 |
| Computer Operators | 100.0 | 3.0 | 12.3 | 27.9 | 29.6 | 16.6 | 8.5 | 2.0 |
| Data Entry Keyers | 100.0 | 5.3 | 17.5 | 27.8 | 26.3 | 15.9 | 5.9 | 1.3 |
| All IT Occupations | 100.0 | 1.7 | 8.2 | 33.6 | 31.2 | 18.5 | 5.9 | 0.9 |
| All Occupations | 100.0 | 5.1 | 9.6 | 25.3 | 27.7 | 20.1 | 9.3 | 2.9 |

Source: Bureau of Labor Statistics, Current Population Surveys, 1996 annual averages

The percentage of workers over 45 may decline for many reasons. Senior engineers and scientists move up the corporate ladder to take on sales, marketing, and management

roles, leaving assignments where they may have acted as “individual contributors” and “technical specialists” for greater responsibility and higher compensation. Some also may leave their positions to leverage their technical talents in other fields or to focus on IT consulting and other related jobs. So while the nature of IT work requires constant education and currency of skill sets, older workers may choose to leave purely technical roles to the younger professionals as they advance in their careers.

Conclusion

The members of the ITAA Blue Ribbon Diversity Panel strongly believe that diversity is an integral part of creating a well-rounded knowledge society. Valuing the contributions of women and minorities in the workplace not only benefits the individual employee, but also makes sense for employers and the community at large. While the ITAA diversity report clearly shows that some underrepresented groups have made progress over the past several years in the IT workforce, there is still more work to be done to increase the numbers for minorities entering and participating in the IT industry. In large part, the persistent underrepresentation of certain groups in the IT workforce can be traced back to the IT pipeline and education. Until more women and minorities receive bachelors degrees in computer and engineering related fields, there is only so much training and re-training the industry can provide. Fundamental education in math, science and technology is critical to the future U.S. workforce, and must remain a focus of all stakeholders.

ITAA and the panel members are committed to supporting this effort and to helping ensure that Women, African Americans, Hispanic Americans, Native Americans, individuals with disabilities, and older workers have opportunities to contribute to a vibrant, rewarding, and lucrative career in the IT industry.

Appendix 1: ITAA Blue Ribbon Diversity Panel Members

Robert Knowling, Chief Executive Officer, New York Leadership Academy (Chairman)

Andrew Bernat, Executive Director, Computing Research Association (CRA)

Elizabeth Black, Vice President, Learning and Organizational Development, Keane

Andy Carvin, Senior Associate, Benton Foundation

Rene Champagne, Chairman & CEO, ITT Educational Services, Inc.

George Crusier, Jr., Partner, PriceWaterhouseCoopers LLP

Elizabeth Echols, CEO, OpNet Community Ventures

B. Keith Fulton, Vice President, Corporate Relations, AOL Time Warner

Vivian Guilfooy, Vice President, Education Development Center

Milt Haynes, National President, Black Data Processing Associates (BDPA)

Shelley Hymes, Director, Office of the 21st Century Workforce,
U.S. Department of Labor

Jim Jacobs, Associate Director, Community College Research Center,
Columbia University

Jennifer Jones, Head of Diversity-IT, J.P. Morgan Chase & Co.

Reginald E. Jones, Former EEOC Commissioner, DSGay Law Group PLLC

Colleen Lee, Director, Worldwide Diversity, MCI

Milton Little, Executive Vice President, National Urban League

Marguerete Luter, Vice President, Global Bid Management, Unisys Corporation

Joyce Malyn-Smith, Senior Project Director, Education Development Center

Jill Miller, Executive Director, Women Work!

Michael Morris, Director, Rehabilitation Research & Training Center, University of
Iowa

Lorilyn Owens, Senior Director, Human Resources, Oracle Corporation

Jeff Shuman, Vice President, Northrop Grumman Information Technology

Tyrone Taborn, Editor-in-Chief, Career Communications Group, Inc.

Ernst Volgenau, President & CEO, SRA International

ITAA Staff:

Harris Miller, President

Marjorie Bynum, Vice President, Workforce Development

Karen Panker, Sr. Program Manager, Workforce Development

Appendix II: Best Practice Diversity Programs

- Black Data Processing Associates (BDPA) Corporate Chapter Program** provides a blueprint for organizing internal programs and activities that support corporate business drivers and gives volunteers an opportunity to demonstrate their leadership skills. (<http://www.bdpa.org>)
- BDPA Mentoring Program** provides coaching from senior executives to middle level managers with an interest in moving up the management ranks. (<http://www.bdpa.org>)
- The Bureau of National Affairs** sends recruiting representatives to job fairs sponsored by minority associations and minority universities (<http://www.bna.com/careers/diversity.htm>)
- Career Communications Group** created Black Family Technology Awareness Week to ensure Black families and youth are a part of the technological revolution. See <http://www.blackfamilynet.net>)
- Education Development Center (EDC) Gender and Diversities Institute (GDI)** involves currently underrepresented groups in the design and implementation of new approaches to technology use and integration. GDI includes the Gender and Science Digital Library, Effective Access: Researching the Use of Digital Resources, and Online Professional Development for Equity. (See <http://www.edc.org/GDI>)
- Goodwill Industries** has a program that trains seniors and disabled individuals for quality placements in technology related careers. (http://www.goodwill.org/index_gii.cfm/2143).
- IBM** targets underrepresented groups as part of their college recruitment initiatives, and has created a team dedicated to recruiting women, minorities, and people with disabilities through projects like ‘Project Able’ and ‘Project View’. (<http://www-3.ibm.com/employment/us/events/diverprog.shtml>)
- INROADS** helps businesses gain greater access to diverse talent through early identification and continuous leadership development of outstanding students of color. Through their leadership development process, they assist companies with anticipating business needs and identifying quality future employees who can contribute to meeting the bottomline. (<http://www.inroads.org/index.jsp>)
- ITT Educational Services, Inc.** operates more than 70 technical colleges around the nation, which have demonstrated success at recruiting Hispanic students. Some of the techniques used in Hispanic recruitment include Spanish language television commercials and recruitment brochures, bilingual recruiters and

- involvement of the prospect's family in decision-making. (<http://www.itt-tech.edu>)
- ❑ **The International Association of Jewish Vocational Services** provides computer-based training to persons with severe disabilities through their disAbility Employment Initiative, and provides outreach to and recruitment of young people with disabilities into national and community service programs through their two-year YouthAbility program. (<http://www.iajvs.org/dis.html>)
 - ❑ **The Job Accommodation Network (West Virginia University International Center for Diversity Information)** matches positions with the needs and talents of disabled people. It is a free consulting service that provides information about job accommodations, the Americans with Disabilities Act, and the employability of people with disabilities. (<http://janweb.icdi.wvu.edu/english/homeus.htm>)
 - ❑ **Keane, Inc.** has created an integrated corporate-wide diversity program that aligns compliance, inclusion and supplier diversity to demonstrate the business case for diversity. All employees are trained in EEO and Diversity subjects, leaders are encouraged to reach out to their individual communities, and WBEs/MBEs are encouraged to become part of Keane's Supplier Diversity Program. (<http://www.keane.com/diversity>)
 - ❑ **Lucent Technologies Cooperative Research Fellowship Program** awards fellowships to outstanding, underrepresented minority groups to graduate students working toward doctoral degrees in math, science, and engineering. (<http://www.lucent.com/news/foundation/crfp/index.html>)
 - ❑ **The Mitre Corporation.** Through affiliations with professional and academic groups nationwide, MITRE promotes interest in engineering as a career choice, and actively recruits new candidates for employment. (http://www.mitre.org/jobs/diversity_activities.shtml)
 - ❑ **The National Action Council for Minorities in Engineering (NACME)** provides the nation's largest private source of scholarships for African American, American Indian, and Latino women and men in engineering and provides early access to career related information in math and science. (<http://www.nacme.org/prec/scholarships.html>)
 - ❑ **Northrop Grumman Information Technology's** commitment towards inclusiveness was incorporated into their Long Range Strategic Plan and Annual Operating Plan to increase inclusive representation in senior level hires, promotions and development through sector-wide executive development and diversity awareness training for all employees. (http://www.northropgrumman.com/who_we_are/diversity/philso.html)

- ❑ **Northrop Grumman Information Technology INROADS** is a partnership to develop talented minority young people into future leaders. Through the internship, students (high school seniors and college freshmen-seniors) are introduced to the business with career-related assignments that further develop the student's academic goals and applicable work experience.
(<http://www.inroads.org/supportinroads.jsp>)
- ❑ **Northrop Grumman Information Technology University Relations** programs and activities are designed to cultivate effective, long-term and meaningful relationships between Northrop Grumman IT and key schools based on geographic locations and core competencies. Business units develop, expand, and maintain Northrop Grumman IT's relationship with the identified key schools.
(<http://www.northropgrummanit.com/careers/college.html>)
- ❑ **Northrop Grumman Information Technology DiscoverE** program encourages women and minorities to enter engineering and technical fields. Twenty-five diversely populated schools are selected from a pool of nominations nationwide, and each school is granted \$1,000. Grants are awarded to help grade school and high school students discover the worlds of engineering and technology as it relates to practical applications of math, science, and engineering to the world around them. (<http://www.eweek.org/site/DiscoverE/index.shtml>)
- ❑ **OpNet** helps to create opportunities for low-income young women and minorities in the information technology industry through intensive training and career development services. OpNet trains students on both technical and job preparedness skills and then assists them in obtaining career track employment in the IT industry. Courses include web design and web programming, Perl, Java, and UNIX Systems Administration. (<http://www.opnetwork.org>)
- ❑ **Oracle Corporation** has a sign language interpreter on staff and works closely with organizations such as Project Hire, The Next Step Center and TransAccess to provide training, mentoring, and other support to prepare underrepresented workers for employment in the high-tech industry and within Oracle.
(<http://www.oracle.com/corporate/community/index.html?content.html>)
- ❑ **The Rouse Company** maintains educational assistance plans to help minority employees pay for job-related courses through scholarships and grants that are part of an approved degree program.
(<http://www.therousecompany.com/howeare/community/index.html>)
- ❑ **Unisys'** award winning Supplier Diversity Program provides opportunities for minority and woman-owned business enterprises (M/MWBE) in the United States to participate as partners and suppliers of goods and services as part of its corporate supply base.
(http://www.unisys.com/about_unisys/commitments/supplier_diversity_program/index.htm)

Appendix III: **List of Cited Resources**

U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, “*Completions*” survey (July 2001).

Bureau of Labor Statistics, Current Population Surveys (2002)

National Science Foundation. *Women, Minorities and People with Disabilities in Science and Engineering 2000*, p. 53 (2000)

National Action Council for Minorities in Engineering. *The State of Minorities in Engineering and Technology*, pp. 40-44 (2001-2002).

American Association of University Women. *Tech Savvy: Educating Girls in the New Computer Age*, p. 7 (2000).

Commission of Professionals in Science and Technology. *Up Hill Climb: The Status of African Americans in Science and Technology*, p. 6 (1999)

Bayer Facts Of Science Education Surveys. *The Bayer Facts of Science Education IV - By Gender (1998)*.

Appendix III: ITAA's Workforce Program

The Information Technology Association of America (ITAA) is a leading provider of data and policy work on the U.S. information technology (IT) workforce. The mission of the ITAA's workforce department is to promote the creation, development, and retention of a skilled IT workforce for the high tech industry through relevant and effective partnerships among industry, education, and government stakeholders. The department draws participation from hundreds of companies from across the Association, including its Workforce and Education Committee chaired by Dr. Ernst Volgenau, President/CEO, SRA International.

ITAA's major workforce development initiatives include:

- Convening an annual **National IT Workforce Convocation** to gauge progress and track best practices in developing the IT workforce.
- Producing original national research on **IT employment and hiring trends**.
- Convening a **Blue Ribbon Diversity Panel** of national leaders from industry, education and government to develop strategies for promoting women and minorities in IT.
- Partnering with the **National Science Foundation** to provide industry-based technical assistance to tribal colleges across the U.S.
- Supporting efforts to employ and promote **people with disabilities in IT** positions through the **IT Works Project** in partnership with the University Of Iowa's Law, Health Policy & Disability Center.
- Assisting in the development of an **IT career cluster** model in partnership with the Education Development Center to integrate IT skills into educational curriculum.
- Linking high tech employers with **Workforce Investment Boards** across the U.S. to address critical training and retraining needs for today's workforce.

For more information about ITAA's workforce programs, contact:

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Or visit www.itaa.org/workforce for a complete list of ITAA's workforce programs.