

**Minorities in the Information  
Technology Workforce:  
Aging Issues**

WANE Working Paper #3

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## **Abstract**

Information Technology (IT) is a field characterized by significant current and projected labor force shortages. The solutions to this problem will have to focus on education, recruitment and retention. Currently, employment in the IT field greatly underrepresents both minorities and older workers. The purpose of this paper is to highlight these issues and suggest research and policy directions.

## Introduction

Defining and delineating the boundaries of the information technology (IT) workforce is not an easy task. The American Electronics Association (AEA) found “no consensus on the definition of the Information–tech industry,” though it did concede that, “Information technology appears to be a lot like quality; people know it when they see it” (North Carolina Electronics and Information Technologies Association [NCEITA], 2000, p.2). For the purposes of this report, the definition as written by the Congressional Office of Technology Assessment will be used. Thereby IT is defined as, “Firms that are engaged in the design, development, and introduction of new products and innovative manufacturing processes, or both, through the systematic application of scientific and technical knowledge,” (NCEITA, 2000, p.2).

According to the Information Technology Association of America [ITAA], the IT industry peaked in 2000 in terms of growth and stability. The following year saw job losses occur in many areas of IT. Reasons for job loss include the dot.com or telecom bubble burst, the completion of Y2K projects, and stock market reverses, especially in the wake of September 11<sup>th</sup> (ITAA, 2003). The beginning of 2002 saw losses stabilizing and small, steady quarter to quarter gains have been reported since then. While many key informants in the industry predicted plummeting demand for hiring, the overall number of individuals employed in the IT sector has steadily increased (ITAA, 2003). (Please see Figures 1 & 2 for detail).

Information technology remains one of the fastest growing industries. Of the top thirty fastest growing occupations in the US, ten are computer related. Computer and mathematical occupations, considered by the US Bureau of Labor Statistics to be the fastest growing of professional and related occupations is expected to add approximately 2,000,000 new employees between 2000 and 2010 (Hecker, 2001). Many sectors of the information technology industry have been generating jobs faster than they can recruit workers (Vance, 2001). A report generated by the ITAA in April of 2001 showed the souring U.S. economic climate had narrowed the IT labor gap, but failed to close it. In 2001 the gap was, in fact, noteworthy; with an estimated 425,000 positions remaining vacant out of 900,000 positions available (Vance, 2001).

In a 2000 study done by the North Carolina Electronics and Information Technologies Association (NCEITA) respondents were asked to identify the main challenges facing the IT industry both at the current time and projecting five years into the future. In both scenarios, employers listed “finding and retaining qualified staff,” as, by far, the most difficult challenge (NCEITA, 2000, p. 5). While a subsequent study shows that the number one challenge for 2001 was “availability of funding,” “finding and retaining qualified staff” remained in the top three challenges cited (NCEITA, 2001, p.6). While actively recruiting more workers, the homogeneity in the racial/ethnic makeup of the IT labor force does not seem to be shifting to include more diverse populations. Despite the aforementioned issues and the additional threat of rising labor costs, Richard Bruner noted,

“Minorities are still struggling for representation in high-technology industries,” (2000, para. 1). Largely employing white males, this labor market could be greatly strengthened and the employee shortage lessened by looking to under-represented populations for new workers (The Congressional Commission on the Advancement of Women and Minorities in Science, Engineering and Technology Development [CAWMSET], 2000; Vance, 2001). Freeman and Aspray, in addressing the underrepresentation of women, Hispanics, African Americans and Native Americans in the IT workforce wrote, “If these groups were represented in the IT workforce in proportion to their representation in the U.S. population, this country would have more than an adequate supply of workers to fill even the most dire estimates of a [IT workforce] shortage,” (1999, p.12). In an article for the *Black Data Processing Association* online journal, Timothy Wilson (2001), an African American in the information technology workforce asks,

*Am I the only one here? While America’s workforce is becoming increasingly more brown and female, the work environment in information technology and web development departments in most organizations is still dominated by white men. In many cases, women and minorities are almost non-existent....You would think that, after thirty-seven years since the passage of the Civil Rights Act of 1964, as a nation we would somehow have figured out how to view one another ‘by the content of our character,*

*instead of the color of our skin’.*  
(para. 1)

A national poll conducted by the New Yorker found that “three out of every five blacks think their conditions are worsening and that the American dream is impossible to achieve”(Renner, 1998, Redefinitions Section, para. 1). As noted in Tracey Minor’s article (2001), surveys by Catalyst show that minorities feel prejudice and overwhelming white male stereotypes have kept them from achieving upper management positions in the technology sector. In feeling excluded from this group, they also fail to create the types of informal social networks that may be important to career growth and satisfaction. Al Zollar, an IT professional holding the top spot at Lotus Development Corp. was quoted as saying, “Technology is one of those industries where it’s easy to become color-blind, because it’s about the skills that you bring to the table” (Copeland, 2000, p.40).

The under-representation of racial, ethnic and other minorities in the technology and science industries has not gone unnoticed by the United States government. On October 14, 1998, Congress established The Commission on the Advancement of Women and Minorities in Science, Engineering, and Technology Development (CAWMSET, 2000). The goal of the Commission was to research the status of underrepresented populations (specifically African Americans, Hispanic Americans, American Indians, women, and persons with disabilities) in the fields of Science, Engineering and Technology (SET). The Commission then set out to recommend ways to improve the recruitment, retention, and

representation of these key populations (CAWMSET, 2000).

Despite the fact that minorities make up a full quarter of the national workforce, they compose only 7% of the Information Technology (IT) workforce (Thibodeau & Holohan, 2000). By 2020 racial and ethnic minorities are expected to comprise one-third of the workforce (Thibodeau & Holohan, 2000). Despite the labor shortage, and the lack of minority participation, American businesses have gone so far as to recruit technology workers from other nations (the so-called “brain gain” movement in the US, though it is called the “brain drain” movement in the countries from which people are being recruited). The 2000 NC Information Technology Workforce Study, carried out by North Carolina Electronics and Information Technologies Association (NCEITA) indicated that over one-third of survey respondents had up to 10% of their employees on work visas. The 2001 study revealed that “nearly half (48%) of all companies surveyed had at least one percent of their workforce on work visas, up from 38%,” in the 2000 survey (NCEITA, 2001, p. 4). Given the potential shortage in skilled American workers it makes sense to look to underrepresented populations to ameliorate this issue and maintain the integrity of the US workforce (CAWMSET, 2000).

In 2003, ITAA published a report on the status of minorities in the IT workforce. According to their data, African Americans represent nearly eleven percent of the overall US workforce, but their participation in the IT workforce declined from 9.1% to 8.2% between 1996 and 2002. During the same time

period Hispanics, who comprise slightly more than twelve percent of the US workforce, rose from 5.4% to a mere 6.3% of the IT workforce. As well, Native Americans increased in IT workforce participation from .2% to .6%, although, as .9% of the US workforce, they remain underrepresented. Asian Americans are an exception to the trend of underrepresentation, as they are nearly three times as prevalent in the IT workforce as the overall US workforce (ITAA, 2003).

Not only is overall underrepresentation an issue, but minorities in the IT industry tend to be employed in jobs that require less education, are lower in status, and lower in monetary compensation. African Americans, for instance, are overrepresented in occupations such as computer operators (13.4%) and data entry keyers (17.1%) which are deemed low status and underrepresented in high status occupations such as electrical and electronic engineers (5.3%), computer systems analysts and scientists (7.1%) and computer programmers (5.4%). Trends are similar for Hispanics (ITAA, 1997). Please see Table 1 for further detail.

Timothy A. Wilson (2001) examined the racial divide by highlighting data from two particular job titles in the IT field. For both job titles – “Operations Systems Researchers and Analysts” and “Computer Systems Analysts and Scientists” the ratio of whites to African Americans was 10 to 1, and the ratio of whites to Hispanics was 25 to 1. He noted that, “of the 207,000 positions in Operations Research, whites occupy 86.6% or 179,262 of them, compared to 8.0% and 3.5% for African Americans

and Hispanics,” (Wilson, 2001, para.6). For the Computer Systems Analysts and Scientists job title, African Americans and Hispanics fared slightly worse, netting a total of only 7.2% African American and 2.5% Hispanics. In this particular instance, women held 28% of the jobs.

### Benefits of Diversity

In its “Strategic Plan for Fiscal Years 2000-2005,” the U.S. Equal Opportunity Employment Commission revamped its mission statement to

*...clearly and concisely [convey] to employers and employees alike that the Commission can not, and will not tolerate any form or level of employment discrimination covered by the laws we implement. Although the statement expresses a noble – and some would say unattainable – goal, the Commission believes, instead, that it embodies the hopes and dreams of our society expressed in our founding documents – the Declaration of Independence and the Constitution of the United States of America – as well as the statutes EEOC has been entrusted to enforce. (U.S. EEOC, 2000, Mission Statement section, para. 1)*

The EEOC holds that fulfilling the ideals of workplace diversity is not only a legal issue, but a moral issue as well, and one that holds consequences both local and global:

*Every act of employment discrimination undermines our country’s ideals of justice and equal opportunity for all, the economic prosperity of American families, and the country’s ability to use all of its human talents and resources to compete in a world economy. (U.S. EEOC, 2000, Perspective: Building...section, para. 1)*

The mission statement goes on to cite remarks made by President Kennedy in a speech given on June 11, 1963, at the height of the civil rights movement.

*We are confronted primarily with a moral issue. It is as old as the scriptures and it is as clear as the American Constitution. The heart of the question is whether all Americans are to be afforded equal rights and equal opportunities, whether we are going to treat our fellow Americans as we want to be treated...(U.S. EEOC, 2000, Perspective: Building...section, para. 3)*

The challenges of successfully implementing these ideals are many. A major challenge is the deceptively simple task of making workplace diversity a key priority from the beginning. In the business of technology, where the “bottom line” often rules, moral reasons for endorsing workplace diversity may not seem especially relevant and legal enforcement can be spotty. But these reasons are not the only benefit of a racially diverse workforce.

According to a Fortune 100 survey of human resource executives, there are at least five reasons to value diversity in the workforce: better utilization of talent; enhanced creativity; increased marketplace understanding; enhanced breadth of understanding in leadership positions; and increased quality of team problem-solving (Robinson & Dechant, 1997). Another survey, conducted by the American Management Association, found that more than one thousand of its members felt heterogeneity (defined as a mixture of ethnic backgrounds, genders, and ages in senior management teams) “consistently correlated with superior corporate performance in such areas as annual sales, growth revenues, market share, shareholder value, net operating profit, worker productivity and total assets” (CAWMSET, 2000, p.12). This begs the question of why, despite the demonstrably positive benefits to be gained by maintaining a diverse workforce in the fields of science and technology, the employment gap persists. In attempting to answer this question, it is helpful to examine some of the roots and roadblocks that propagate the racial employment gap, as we know it.

### Underlying Barriers

In their 2000 report CAWMSET mentioned the following underlying barriers to diverse employment in the science, technology and engineering fields: sub-par precollege education, lack of access to higher education, bias and the absence of mentoring in the working world, exclusion from informal networks, difficulty balancing family and work life, fewer opportunities to accrue management experience, media reinforcement of stereotypical

perceptions, less access to technology, financial and cultural bias and a lack of national accountability. While the plethora of underlying problems mentioned above likely hold merit, the ability to comprehensively examine them is beyond the scope of this paper. However, it is worthwhile to take a closer look at several of the key barriers noted.

### *Education*

A strong educational foundation, beginning as early as the preschool years (0-4), could do much to diversify the SET workforce. Evidence shows that minorities tend to:

- lack access to high quality education in their precollege years (CAWMSET, 2000; National Center for Education Statistics, 1999).
- be concentrated in inner-city schools with fewer resources (CAWMSET, 2000; National Center for Education Statistics, 1999).
- be subject to tracking that eventually bars them from taking upper level courses (CAWMSET, 2000; National Center for Education Statistics, 1999); and
- have lower graduation rates than whites (CAWMSET, 2000; National Center for Education Statistics, 1999).

Headlines of gains made by minorities in the area of education can be misleading. Statistics released by the U.S. Department of Education in its annual report, “Enrollment in Higher Education” highlighted the fact that over

the last 20 years, gains have been made in the absolute number of blacks enrolled in higher education (Renner, 1998). However, statistics can be misleading and this one in particular fails to take into account other factors which would give a richer and more accurate perspective. The absolute number of black students enrolled is reflective of the increase in the minority population and the steady decrease in high school drop out rates (Renner, 1998). In fact, “only whites have made progress, increasing their access to higher education by increasing their participation rate over this period from 32 percent to 42 percent” (Renner, 1998, para. 8). Blacks may comprise 12% of the population, but the average enrollment in the “373 non-black flagship institutions – which include all of the large state universities with graduate programs,” is a mere 6% (Renner, 1998, The New Challenge section, para. 8). Segregation in institutions of learning is alive and well. Renner (1998) sums the situation well when he asks,

*How can white academics explain the fact that 30 years of affirmative action have not resulted in any gains for blacks relative to whites in higher education, while over the same period the gap in high school graduation has been virtually erased? (Redefinitions section, para. 4)*

Minorities take “fewer high-level mathematics and science courses in high schools, earn fewer masters and doctoral degrees in computer science and are less likely than white males to be employed in [the technology] field” (Minor, 2001,

para. 4). Craig A. Garner notes that, by not having access to the type of skills necessary for a successful career in information technology we will ultimately have “a generation of young adults who can be legitimately discriminated against in the workforce based on their lack of logic skills and computer training” (2001, para. 1). Garner also points out that, “many of the urban schools are ill prepared to serve our youth in the area of information technology” (2001, para. 4). He cites lack of equipment, inappropriate or under-qualified staff, old buildings that do not have the proper wiring and overcrowded classrooms that force students to share minimal time on a few computers as factors contributing to the unsatisfactory education of minority students (Garner, 2001). Such factors add up to major stumbling blocks for students interested in careers in technology. In essence, a sub-par precollege education inhibits the individual from attending college – a key element of success in getting a job in the world of information technology. In fact, a study prepared by the Educational Testing Service estimates that 86% of high-tech jobs require at least some college education (Carnevale, 1999).

### *The Digital Divide*

Closely related to the issue of education is the so-called “digital divide.” This term, coined by the US Department of Commerce, is commonly used to refer to the gap between the “haves” and “have-nots” of access to technology (CAWMSET, 2000). Not surprisingly, persons with low-income, minorities, persons with sub-par education and children of single-parent households are among those most likely to lack access

to information technology (CAWMSET, 2000). The US Dept. of Commerce began tracking the digital divide in 1994. Although reporting that African Americans were twice as likely to own a computer in 1998, than they had been in 1994, the gap in Internet use between African Americans and whites continued to increase (Vaas, 2000).

As previously noted, the school systems that typically serve minority populations also tend to be those with the least amount of available funding and technology (Garner, 2001; CAWMSET, 2000). While US public schools have gained much greater Internet access in a relatively short period of time (up from 3% in 1994 to 63% in 1999), schools whose students maintained the highest concentrations of poverty still had the least access to internet connections. In 1999 only 39% of these schools with high concentrations of poverty (defined as 71% or more of the students being eligible for free or reduced-price lunch) had Internet access (CAWMSET, 2000).

If gaining technological knowledge at school is not a viable option, then one might hope that students' home environments would be able to foster familiarity with computers and the Internet. Not surprisingly, the race and income gap lurks just as wide in this arena. White children and households with annual incomes above \$75,000 tend to have the most access to technology with 61% and 88%, respectively, owning home computers. This is a sharp contrast to the African American and Hispanic children having access to home computers (24% and 23% respectively) and those households with less than \$25,000 of annual income – where just

20% own computers (CAWMSET, 2000).

Less access to school technology, coupled with less access to technology resources at home, potentially renders the student ill prepared to enter the world of technology and to successfully find a job. As reported in the executive summary for the Information Technology Association of America (2002), having skills and education are crucial for “getting and keeping” jobs. Two points it maintains are that: a) “...certification has grown in significance for each of the job categories, while general job experience has declined in importance as an entry-level skill credential,” and b) “Four year college was particularly important for database developers, programmers and software engineers, enterprise systems integrators, and technical writers” (ITAA, 2002, p.3). The bottom line is clear: without hands-on experience in the world of technology, African-Americans will not be allowed to share in the wealth of opportunities available in the IT industry (Vaas, 2000).

### *Media*

Public perception is shaped by the bombardment of information that comes from television, newspapers, magazines, and other media sources. As aptly noted by CAWMSET in its 2000 report,

*Despite decades of social change, the general perception remains that technical workers, scientists, and engineers are unusually intelligent white men who are socially inept, absent-minded nerds ....Caricatures of (mostly male) scientists continue*

*to appear on billboards, in magazine ads, in movies, and on television sitcoms. (p.59)*

The pervasive image of the Caucasian, socially inept man in a white lab coat is one that self-perpetuates. If the majority of workers in the SET sector are men, then advertising companies are more likely to target this audience in their media endeavors by having models that most closely match the self-perception of those they are trying to entice.

Using the Draw-A-Scientist Test (DAST) researchers have been able to point to a strongly consistent (stereotypical) image of scientists, displayed in children as young as the second grade. Unfortunately, this trend persists throughout the grades – even into undergraduate and graduate students who have by then (generally) been exposed to women and minorities in SET careers (Barman, 1997). Among the drawings presented at all grade levels, “only female students drew female scientists, and this occurred rarely. A few underrepresented minority scientists were depicted as well, presumably by underrepresented minority students” (CAWMSET, 2000, p.60).

Studies have shown that the public remains woefully uninformed about the actual goings-on in the world of science (CAWMSET, 2000). Unfortunately, the general public often relies on the media to inform them of the technical and scientific world. Given the stereotypical and self-perpetuating myth of the white, male nerd, it is crucial that we recognize ways to break down this media-fed stereotype.

### *Age-Related Considerations*

The aging of the workforce in the United States is a phenomenon occurring across race, ethnicity and gender lines. The aging population is becoming more racially and ethnically diverse, and poverty rates become higher with age. The continuation of work for minorities in later life is particularly salient, because statistics have shown that the health and financial well-being of minorities suffers more in later life than that of non-minorities (University of North Carolina [UNC] Institute on Aging, 2000). Race, class, and gender compound the aging process, and this results in higher risks for health and social problems (UNC Institute on Aging, 2000). Maintaining gainful employment often increases access to healthcare benefits and strong social networks – potential factors in sustaining physical and mental health. Ensuring continued employment opportunities for older workers allows this population to continue to contribute, avoiding exclusion from society and mitigating dependency (American Association of Retired Persons [AARP], 2003). Not surprisingly, there is a dearth of research examining the aging minority workforce in the IT workforce; however, by drawing on known data, it becomes clear that this is an issue that merits further examination and research.

As we have seen, the IT workforce has thus far not utilized racial and ethnic minorities in a manner reflective of equal opportunity employment. In a similar fashion, the IT workforce is not properly reflective of the higher proportion of aging workers, as the baby boom generation nears and enters later life. Americans are living longer,

working longer, and technology is becoming a more integral part of the way we live our daily lives. The IT workforce should be reflective of these demographic changes. The bulk of increase in the US labor force between 2000 and 2050 is projected to occur in the 55+ age category. In fact, the participation rates of workers over fifty-five are expected to rise from 12.9% (2000) to 18.8% in 2050 (Toosi, 2002).

Despite this rapidly growing source of workforce potential, nearly sixty percent of the IT labor force is under the age of 40 (National Research Council, 2001). National Research Council (2001) data compare IT workers by age group from 1993 to 1997. The age group of 31 to 40 consistently holds the highest percentage of IT workers, around 40% in 1993, 1995, and 1997. While the number of older workers (defined here as “over 50”) increased slightly in the four year time period, participation was by far the lowest of any other age group. In 1997 it reached its highest percentage of 13.5%, up from 9.7% in 1993. For further detail, please see Table 2.

According to Norman Matloff, a professor of computer science at UC Davis, there is no labor shortage in the technology workforce. He asserts that, “Employers are shooting themselves in the foot because they’re only willing to hire certain groups of people” (King, 1998). In hiring new employees, employers are limiting themselves to a homogenous group of candidates, overlooking key groups like older workers and minorities. Matloff, citing surveys of high-tech hiring managers, noted that “only 2 percent of them seek workers having more than 10 years of experience, and only 13 percent of

managers under 30 had hired anyone over age 40 in the past year,” (Matloff, 2000, p.A35). Compared to industries with comparable employee education requirements, the IT industry is not only younger, but is perceived as engaging in rampant age discrimination (National Research Council, 2001). However, Freeman and Aspray (1999) note that age discrimination is notoriously hard to prove, and as the Equal Employment Opportunity Commission [EEOC] does not break down its discrimination data into a category that would include only IT workers, it is difficult to estimate the numbers of IT employees who may have filed age discrimination suits.

Some managers are aware of the “unique skills each generation can bring to the workplace” (McGee, 2002, p.47). One such manager is Bill Meilahn, senior VP and CIO at an IT organization. “It makes the team stronger . . . younger kids know about Web-based development tools and technologies, and the older people have great experience with mainframe and midrange systems” (McGee, 2002, p.47). Kindred Healthcare has implemented a mentoring program within its IT workforce that often pairs younger employees with “older, more experienced IT professionals who serve as mentors for about a year,” says Rich Chapman, senior VP, CIO and chief administrative officer (McGee, 2002, p.48). In his words, “This approach gives each IT project a mix of age and experience. Older IT people know more about the business and have more hands-on experience, and younger staff often have good ideas” (McGee, 2002, p.48).

Unfortunately, not everyone in the IT field is so welcoming of such age-diversified employee structures.

Different communication and work styles, economic uncertainty and age-related bias on both ends of the spectrum can cause tension among workers and management alike (McGee, 2002). As a 26 year old Web developer at a major communications firm commented about a 60-year old co-worker, “I just can’t take him seriously, because I don’t know if he knows what he is talking about” (McGee, 2002, p.49). Older workers may often feel protective of their time-earned knowledge, and see younger staffers as “lazy kids” (McGee, 2002). The slow economy only complicates issues. With job security at a premium, teamwork may seem more of a job security liability than an asset.

#### Organizational Response to Diversity Issues

During the public hearings held for CAWMSET, several key players came forward who exemplified forward-thinking methods of recruitment and retention of minorities. In October of 1999 Chevron submitted its key set of principles, aptly called The Chevron Way. A core principle of this strategy is “Valuing Diversity,” an objective that works to support women and minorities and aid their advancement throughout the company. Chevron builds its diversity initiative from “three inter-linked focus areas: (1) Leadership Behaviors, (2) Inclusive Work Environment, and (3) Visible Diversity.” An example of a specific strategy for increasing diversity within its organization would be to:

*Leverage research relationships with university graduate departments to develop interactions, processes and*

*programs that will support opportunities to increase the advanced degree population for women and minority students.*  
(The Chevron Way, 1999)

Another large corporation, First Union, and its community partners launched an initiative in August of 2000 to address the “digital divide.” This trend is most often reflected in the limited access of minorities and those with low incomes (often the same population), and refers to the lack of access to technology. These individuals are at “a disadvantage in pursuing education, jobs and financial goals” (PRNewswire, 2000, para. 2) First Union has partnered with various entities, such as the city of Charlotte, and the Charlotte-Mecklenburg Schools to increase funding and outreach. The eCommunities initiative has two main components. 1) Partners in the community are offering “free training classes for those interested in learning how to use computers and the Internet.” 2) community partners will “focus on increasing information technology access and skills among targeted community groups, including lower-income individuals, minorities, youth and senior citizens” (PRNewswire, 2000, para. 3).

Other organizational initiatives include:

- Microsoft Corp, Netier Technologies, Bell Atlantic Corp. and others donating hardware, software and training to an inner-city project, helping residents in a once crime-ridden sector (Vaas, 2000).
- “ClickStart,” a federal government initiative, provides computers and Internet access to low-income

families. In addition, they are expanding tax-advantaged “empowerment zones” which help newer technology businesses get established in the inner city (Vaas, 2000).

- The Black Data Processing Associates have an annual High School Computer Competition to benefit high-school aged minorities (Vaas, 2000).

Individual contributions to garnering awareness of change of these issues are no less pertinent. Denise Street-Robb, president of an IT recruiting firm in Atlanta, has “urged high-tech companies to form closer ties with and recruit candidates from colleges and universities with a strong track record in educating minority students” (Copeland, 2000, p.40). K. Edward Renner, a private consultant in the area of institutional change in higher education, challenges the established norms and advocates for broad legal and educational change.

*What the white establishment is doing in redefining the legal standard for racial fairness as procedural uniformity, in the name of greater justice, is in practice harmful to blacks and self-serving for whites. This ignores the necessity of treating social justice as an outcome by confounding social and legal concepts. (1998, Social Justice...section, para. 6)*

Resources for minorities seeking guidance in the area of technology are not always easy to find. In July of 2002, Fortune magazine (Fortune.com) released its fifth annual “Best

Companies for Minorities” list. Many of these organizations are in the technology sector. These organizations are not immune to the financial issues that face the US market, but are still willing and committed to hiring, promoting and retaining skilful employees of all races. For a listing of these companies, please see Appendix A. More specific to individuals in the technology industry, Blackmoney.com has compiled a list of the 50 Most Important African-Americans in Technology. For details, please see Appendix B. Finally, web resources for African-Americans are becoming more prevalent. In 2000, PC Week listed a few key networking and educational web-sites for IT Professionals who are African-American (please see Appendix C).

Despite these initiatives, we have found no evidence that special efforts have been made to address both minority and age issues simultaneously. Moreover, existing initiatives, or expressions of concern about minority participation in the IT sector, focus almost exclusively on training and recruitment issues, rather than on retention issues. This deficit merely reflects the neglect of retention issues in the general literature about meeting human resources needs in the IT sector: The focus is on educating a new generation of IT workers rather than on providing means to secure their continuing participation in the IT sector.

#### *Implications and Recommendations*

As noted in the U.S. EEOC’s Strategic Plan for Fiscal Years 2000-2005, “The workplace is merely a microcosm of society. It reflects society’s advances and shortcomings,” (EEOC 2000, Outlook section, para. 8). In examining

the gross under-representation of racial and ethnic minorities in the information technology workforce, we are actually addressing a much larger societal issue. By the same token, in addressing these issues with plans for positive and concrete change, society as a whole may benefit. Fortunately, there are individuals and organizations acting as key players to change the problem of discrimination in the workforce, but there are perhaps not enough; and certainly not enough who are aware of the potentially adverse effects on older minority workers in a milieu which might have little tolerance either for their race or their age.

Further research is recommended in the area of minorities in the Information Technology workforce. Issues to be addressed should include aging workers, retention, discrimination and hiring practices, education, the digital divide and the role of the media. One area for investigation might be the extent to which human resources managers in the IT sector who hold negative stereotypes about racial minorities or women are also more likely to hold negative stereotypes about the ability or motivation of older workers to learn new IT skills and to employ them. More specifically: does being Black and Old constitute “double jeopardy” through which negative attitudes and discriminatory behavior act to make IT work unwelcoming for them? Are blacks and other visible minorities negatively stereotyped in terms of their ability to work in the IT sector? Further, is this stereotyping done as part of a broader tendency to stereotype, or are age and race different and unrelated domains?

At the policy level, perhaps the greatest challenge is to overcome discriminatory practices in hiring and within the workplace. Managers should diversify their outlets for recruiting new employees of different backgrounds. Access to training, promotion, and benefits are necessary if workers, regardless of race and age, are to build rewarding careers over their lives. While overcoming discrimination in hiring will help to meet labor force needs in IT, the provision of such careers will address the neglected retention issue (Marshall, 2002).

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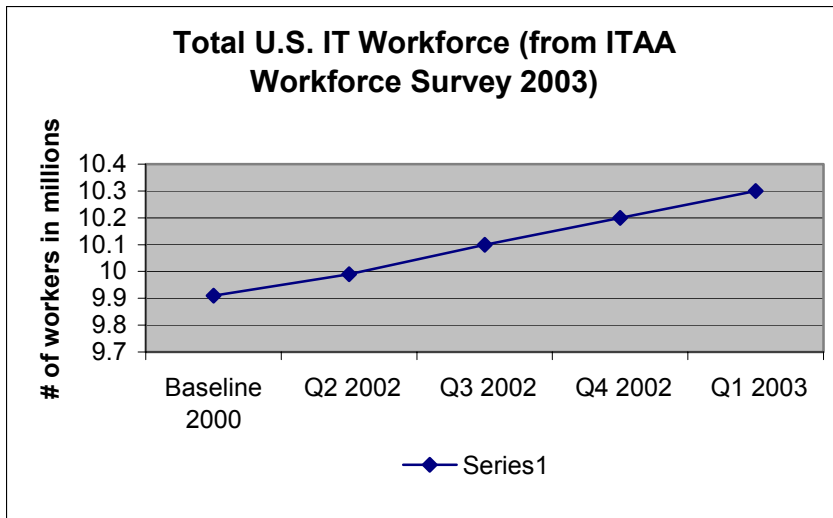
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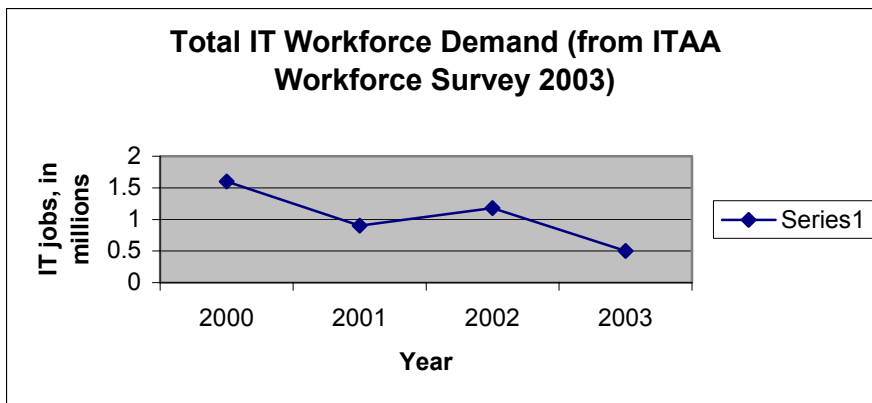
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**Figure 1. Number of IT Workers Hired (in millions), 2000-2003.**



**Figure 2. IT Workforce Predicted Hiring Needs (in millions), 2000-2003.**



**Table 1. Data on Racial/Ethnic Minorities' Representation in the IT Workforce**

Occupations	Total Employed	Race/Ethnicity (as % of total)			
		White	Black	Hispanic	Other
Electrical and Electronic Engineers	603,000	86.1%	4.3%	3.9%	0.6%
Computer Systems Analysts & Scientists	1,091,000	81.9%	7.1%	2.5%	0.4%
Operations and Systems Researchers & Analysts	207,000	86.6%	8.0%	3.5%	1.4%
Computer Programmers	558,000	83.8%	5.4%	4.6%	0.4%
Computer Operators	398,000	83.6%	13.4%	8.1%	0.6%
Data Entry Keyers	690,000	77.9%	17.1%	11.0%	0.8%
All IT Occupations	3,547,000	82.6%	9.1%	5.4%	0.6%
All Occupations		85.1%	10.7%	9.2%	0.7%

Source: Information Technology Association of America [ITAA]. (1997). *Building the 21st century information technology workforce: Underrepresented groups in the information technology workforce*. Task Force Reports, p. 3. Retrieved March 18, 2003 from <http://www.ita.org/workforce/studies/recruit.htm>

**Table 2. Percentage, by Age Group, of Science and Engineering Graduates Employed in IT and Non-IT Occupations, 1993 to 1997**

1993			1995		1997	
Age Group	IT	Non-IT	IT	Non-IT	IT	Non-IT
21 to 30	20.2	15.8	16.8	15.4	15.5	16.2
31 to 40	43.3	31.0	42.2	28.8	40.1	25.9
41 to 50	26.8	32.0	29.8	33.0	30.9	33.1
Over 50	9.7	21.2	11.2	22.8	13.5	24.8

Source: National Research Council (US) Committee on Workforce Needs in Information Technology. (2001). *Building a Workforce for the Information Economy*. National Academy of Sciences, p. 66. Retrieved July 1, 2003 from [http://search.nap.edu/html/building\\_workforce/](http://search.nap.edu/html/building_workforce/)

## Appendix A

### Fortune.com - BEST COMPANIES FOR MINORITIES

#### Diversity Leaders

The firms on FORTUNE's fifth annual Best Companies for Minorities list aren't immune to problems currently plaguing corporate America. But despite adversity, these companies have not abandoned their commitment to hiring, promoting, and retaining talented employees of all races.

2002 Rank	Company	Revenues (\$ millions)
1	<u>Fannie Mae</u>	50,803
2	<u>Sempra Energy</u>	8,029
3	<u>Denny's</u>	1,391
4	<u>SBC Communications</u>	45,908
5	<u>McDonald's</u>	14,870
6	<u>PNM Resources</u>	2,352
7	<u>Southern California Energy</u>	12,184
8	<u>U.S. Postal Service</u>	65,834
9	<u>Freddie Mac</u>	35,523
10	<u>BellSouth</u>	24,130
11	<u>UnionBanCal</u>	2,912
12	<u>Lucent Technologies</u>	25,132
13	<u>Consolidated Edison</u>	9,634
14	<u>Xerox</u>	16,502
15	<u>PepsiCo</u>	26,935
16	<u>Colgate-Palmolive</u>	9,428
17	<u>Wyndham International</u>	2,105
18	<u>Silicon Graphics</u>	1,854
19	<u>Hyatt</u>	3,950
20	<u>Procter &amp; Gamble</u>	39,244
21	<u>DTE Energy</u>	7,849
22	<u>Hilton Hotels</u>	3,050
23	<u>Levi Strauss</u>	4,259
24	<u>Marriott International</u>	10,152
25	<u>United Parcel Service</u>	30,646
26	<u>Applied Materials</u>	7,343
27	<u>Washington Mutual</u>	17,692
28	<u>TIAA-CREF</u>	24,231
29	<u>American Express</u>	22,582
30	<u>PG&amp;E Corp.</u>	22,959
31	<u>Verizon Communications</u>	67,190
32	<u>Coca-Cola</u>	20,092
33	<u>Avon Products</u>	5,995
34	<u>Cisco Systems</u>	22,293

35	<u>Abbott Laboratories</u>	16,285
36	<u>Nordstrom</u>	5,634
37	<u>S.C. Johnson &amp; Son</u>	4,500
38	<u>J.P. Morgan Chase</u>	50,429
39	<u>Darden Restaurants</u>	4,021
40	<u>Pitney Bowes</u>	4,691
41	<u>Bank of America Corp.</u>	52,641
42	<u>Knight-Ridder</u>	2,900
43	<u>Eastman Kodak</u>	13,234
44	<u>Allstate</u>	28,865
45	<u>Intel</u>	26,539
46	<u>AFLAC</u>	9,598
47	<u>Citigroup</u>	112,022
48	<u>Prudential Financial</u>	27,177
49	<u>Ford Motor</u>	162,412
50	<u>UAL</u>	16,138

Source: Best Companies for Minorities. (2002, July 8). *Fortune*. Retrieved August 20, 2003, from <http://www.fortune.com/fortune/diversity>

## Appendix B

### **The 50 Most Important African-Americans in Technology**

(Top 15 listed below. For a complete list of all 50, please refer to <http://www.blackmoney.com/mostlist.html>)

- 1) Pinnacle Award winner – Philip S. Thompson, VP of Business Transformation/CIO, IBM Corp.
- 2) Richard Parsons, CEO, AOL Time Warner (2002 Pinnacle winner)
- 3) John W. Thompson, Chairman/CEO, Symantec Corp.
- 4) Ray Wilkins, President, Sales and Marketing Group, SBC Communications Inc.
- 5) Al Zollar, General Manager, IBM/Lotus Development Corp.
- 6) Myrtle Potter, Executive Vice President, Chief Operating Officer, Genetech, Inc.
- 7) Ursula Burns, Senior Vice President, XEROX
- 8) Dr. Shirley Jackson, President, Rennasalear Polytechnic Institute
- 9) Gen. Lester Lyles, Commanding General, U.S. Air Force Material Command
- 10) Stephen Perry, Administrator, U.S. General Services Administration
- 11) Michael Powell, Chairman, Federal Communications Commission
- 12) David Turner, Senior Vice President Sales and Marketing, Gateway Computers
- 13) Rod Adkins, General Manager, Pervasive Computing, IBM
- 14) Chuck Smith, CEO, SBC Pacific Bell
- 15) Lloyd Trotter, CEO, GE Industrial Systems

Source: *The 50 Most Important African- Americans in Technology*. (2003, February 1). Retrieved August 20, 2003, from <http://www.blackmoney.com/mostlist.html>)

## Appendix C

### Networking and Educating Websites for African-American IT Professionals

[www.kenyada.com](http://www.kenyada.com)

Mr. Kenyada's Neighborhood Inc. is an Atlanta-based online community typical of the grass-roots programs springing up to promote computer literacy and ownership in the African-American community.

[www.bdpa.org](http://www.bdpa.org)

Black Data Processing Associates has been linking the IT and African-American communities since 1975. With 40 chapters across the country, BDPA offers career counseling, technology assistance, networking opportunities and workshops for IT pros, along with computer competitions for talented students.

[www.blackvoices.com](http://www.blackvoices.com)

Chicago-based Blackvoices.com Inc. has a fledgling technology message board that bears watching as it matures.

[www.ashontitesh.com](http://www.ashontitesh.com)

Ashanti Technologies Inc. is an Atlanta-based organization that's dedicated to increasing technology awareness in the African-American community.

[www.afroamculture.about.com](http://www.afroamculture.about.com)

A portal of Internet communities for African-Americans hosted by About.com Inc.

Source: Networking and Educating Websites for African-American IT Professionals. (2000, January 31). *PC Week*, 17(5), 65.