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ABSTRACT

The Digital Economic Opportunity Committee (DEOC) was established to examine the information technology (IT) skills gap and make recommendations to eliminate this gap. DEOC believed the appropriate response to this skills gap is two-fold. The first was upgrading existing workers skills through training. The second was expanding the number of skilled workers by improving the education system and by seeking workers from labor pools not traditionally found in the IT workforce (women, minorities, people with disabilities, and seniors) and from underrepresented communities (rural, inner city, and low income). A conference sponsored by DEOC addressed these groups' greater participation through presentations and panel discussions on enlarging the pool of IT workers; barriers that hinder technical training and access to well-paying IT job opportunities; and what could be done to access, train, and retain more members of these populations for the new digital-age economy workforce. The barriers identified were organized and defined as cultural/social, technological, educational, opportunity/choice, and structural. Possible solutions to provide greater participation in the IT workforce for members of underserved communities were improved education, increased public awareness and information, enhanced motivation and support, fostering of leadership and partnerships, encouragement of employer participation, and government involvement. (32 notes) (YLB)

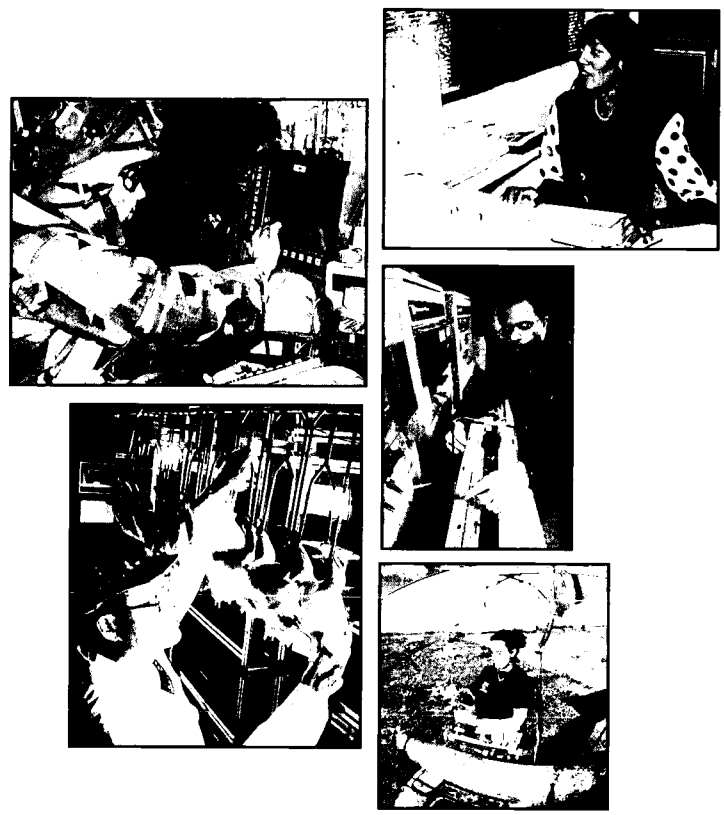
BUILDING DIGITAL WORK

PART 2: REACHING OUT TO UNDERSERVED COMMUNITIES

ISSUED BY THE
NATIONAL POLICY ASSOCIATION
DIGITAL ECONOMIC OPPORTUNITY COMMITTEE
APRIL 2002

BUILDING A DIGITAL WORKFORCE

Part 2: Reaching Out to Underserved Communities



Issued by the
NATIONAL POLICY ASSOCIATION
Digital Economic Opportunity Committee

April 2002

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Contents

Introduction

Early in 2001, the National Policy Association (NPA) established the Digital Economic Opportunity Committee (DEOC) to examine the information technology (IT) skills gap and to make recommendations to eliminate this gap. The committee's objective is to turn the digital divide into digital economic opportunity for:

- Current workers who lack the skills required to do today's jobs.
- Prospective workers who have not been included traditionally or have been underrepresented in the IT workforce.
- Future workers who come directly into the workforce from K-12 and postsecondary schools.

Through committee meetings, conferences, and publications over an 18-month period, this committee of 15 business, labor, and education organizations, representing more than 10 million workers and union members, has been exploring seven key areas related to improving opportunities for these workers:

1. Assessing workforce IT training and educational needs.
2. Increasing and improving IT education, training, and instruction.
3. Expanding resources for employee training.
4. Attracting and training women, minorities, and other nontraditional groups to IT fields.
5. Involving IT workers in teaching, mentoring, and working with students in local school systems.

6. Partnering among business, labor, education, and community to address IT training and educational needs.

7. Removing barriers to IT jobs for members of underrepresented groups, especially low income and rural communities.

In its first report, published in November 2001,[1] the Committee addressed the upgrading of IT skills for incumbent workers. In that report, the DEOC defined today's IT worker as "virtually every worker in the new economy." All occupations in today's workforce require some level of IT ability. The report examined the extent of this 21st Century labor problem and provided insight into two significant factors that contribute to this gap: (1) existing illiteracy and innumeracy among many adult workers, and (2) the lack of an adequate, ongoing workforce development training system. Lastly, it began to offer solutions for building a digital workforce.

This second report, in a series of three, focuses on increasing the pool of IT workers by overcoming barriers to recruiting and training members of nontraditional labor pools and underrepresented communities. It is based on a conference, "Enlarging the Pool of IT Workers to Meet Tomorrow's Needs," held on December 12, 2001, in Kansas City, Missouri.

The conference, sponsored by the DEOC, brought together individuals with an interest in workforce development of underserved populations. Participants came from across the nation and represented business, labor, education, government, and the nonprofit sector. Through a series of panel discussions, the conference addressed three key questions concerning greater participation in the IT workforce by women, minorities, people with disabilities, seniors, Native Americans, and rural and lower income, inner city residents:

- What are the barriers to obtaining well-paying 21st Century new economy jobs?
- How are these barriers being overcome?

- What are the particular skills needed to participate as a successful member of the digital workforce?

This report begins with a summary of the conference proceedings, followed by a description of the populations that are under-represented in the IT world. The report then discusses barriers to participation and some potential solutions identified at the conference for overcoming the barriers.

Through both the Kansas City conference and this report, the DEOC is reaffirming the view, stated in its first report, that "there is a skills shortage, not a worker shortage." By increasing the skill levels of those populations traditionally left out of the IT workforce, the economy can gain the skilled workers it needs to be productive and efficient.

Enlarging the Pool of IT Workers

NPA has conducted two of its three planned "Crossing the Digital Divide to Digital Economic Opportunity" conferences as part of its research project that is examining workforce development issues in the emerging "information society." These conferences assessed the IT skills gap and the training needed by workers to access and use technology to gain better jobs. The conferences also highlighted efforts being made by businesses, unions, educators, governments, and nonprofits to close this current gap and adequately prepare the workforce of tomorrow.

The first conference, held in Boston on June 27, 2001, examined the skills, upgrading, and training needed by existing workers, including those currently in the IT workforce. The DEOC's first report was based upon that conference.

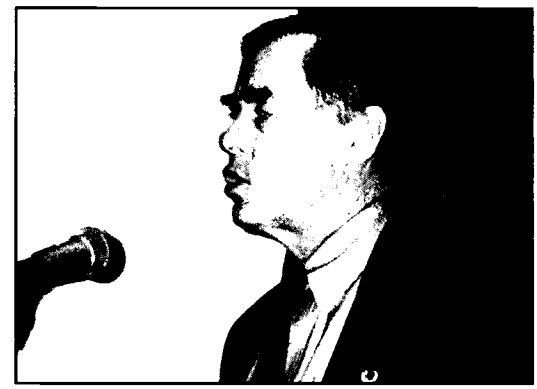
Opening the DEOC second conference were (from left) Anthony C. E. Quainton, NPA President and CEO; Jack Golodner, DEOC Co-Chair; and Ralph Craviso, DEOC Co-Chair.

The second conference, entitled "Enlarging the Pool of IT Workers to Meet Tomorrow's Needs," was conducted in Kansas City, Missouri, on December 12, 2001, and is the subject of this summary. The conference focused on closing the IT skills gap and increasing IT job opportunities for those not traditionally found in the IT labor force: women, minorities, people with disabilities, seniors, Native Americans, and those living in rural and lower income, inner city communities.

There will be a final symposium in San Francisco on April 17, 2002. It will present the DEOC's draft final recommendations and provide reactions from a panel of experts and participants representing business, labor, government, education, and the nonprofit sector.

Enlarging the Pool of IT Workers to Meet Tomorrow's Needs

Anthony C. E. Quainton, President and CEO, National Policy Association, opened the Kansas City conference by explaining why NPA was holding a conference on this issue. Unlike so many technical conferences that bring together narrow groups of experts, he pointed out, this conference was truly multisectional and multidimensional. "If the terrible events of September 11 have taught us anything," he said, "we must find ways, as a country, to pull together to make sure that no sector of our society is left behind." NPA is concerned that income inequality has widened steadily over the last four decades. This same phenomenon is true of societal access to and use of information technology. Mr. Quainton went on to discuss the impact of digitization on the new economy, the intensity of change it has created, and the need for new technology skills for the workforce. Pointing out that the digital divide still exists in America, especially for many minority groups, he noted that the conference was not about the gap in computer access, but about the skills gap. Closing this skills gap requires an improvement in the education and training of the workforce and recognition of the need for lifelong learning and a change in the nature and methods of training. He concluded by saying that NPA had created the DEOC, which comprises business, labor, and education members, to provide recommendations on how best to prepare future workers with needed IT skills and also raise the technical skills of the existing workforce.



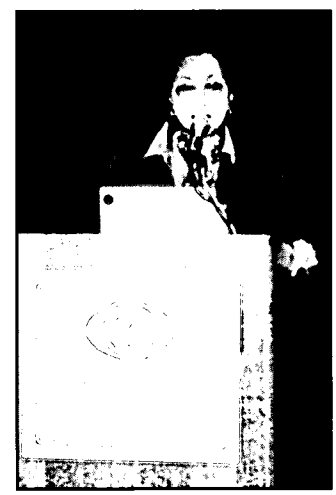
NPA President and CEO Anthony C. E. Quainton discusses the multidimensional perspective of the DEOC's Kansas City conference.

Morning Panel Discussions: "Solving the Challenges Faced by the Nontraditional IT Workforce in Today's Technologically Advanced Workplace"

Concurrent sessions explored the barriers that hinder the technical training as well as access to well-paying IT job opportunities for women, minorities, people with disabilities, and seniors. These discussions also addressed what could be done to access, train, and retain more members of these populations for the new digital-age economy workforce.

Women and Minorities

Moderator: Katherine Hanson, Director, Gender and Diversities Institute, Education Development Center in Newton, Massachusetts.[2]



Rory R. Paredes, Graduate School, USDA, identified barriers for women moving into the IT field.

Rory R. Paredes, Technology Management Specialist at the Center for Applied Technology Graduate School, U.S. Department of Agriculture (USDA),[3] outlined the various strategies of the Center for Applied Technology in addressing barriers for women branching into the IT field. Among the barriers she identified were: a lack of knowledge about options, multiple workloads (both family and work obligations), lack of funds, lack of workplace mentors, no IT career ladders, and lack of competency-based training. The Center offers women career support services, uses computer literacy standards, and provides training certificates. Through its Certified Webmaster Program, individuals are taught to meet the challenges of Website architecture through a team perspective and mentoring. Ms. Paredes closed her presentation by focusing on the importance of training and mentoring within the workplace as a means of overcoming the challenges faced by minorities within the IT workforce.

Wanda L. Johnson, Deputy Director of the Water, Wetlands, and Pesticides Division of the U.S. Environmental Protection Agency (EPA), focused on education, access, and corporate culture as key barriers to involving the African American community in the IT field. Quality education for youth must start at the K-12 level. Students form career choices in high school; therefore, it is a function of both parents and counselors to expose and encourage students to enter the IT workforce. Ms. Johnson firmly believes that early recruitment and role models are important influences on young people. Because the Internet is not a world with which African Americans readily identify, she suggested that its content needed to offer interest and value to them to further encourage its use. Access is about "access to content" that people find meaningful and useful to them. Lastly, because many companies do not foster an inclusive workplace environment, she recommended that actions be taken to reach out to minority students and workers.

Ian Bautista, Deputy Director of El Centro, Inc.,[4] explained that the role of his organization is to better serve families within the Kansas City Latino community. Mr. Bautista emphasized that because the Latino community represents many different populations and cultures within our society, his remarks would not necessarily fit all cases. He identified several major obstacles for Latino entry into the IT workforce, including a language barrier, a lack of understanding of workplace norms and culture within the U.S., and a general lack of exposure to personal computer (PC) technology. Mr. Bautista urged that public and private resources be merged to leverage the limited resources available to provide more training. Other recommendations included advocating for public policy changes, accommodating employees' needs regarding family commitments and childcare, setting flexible training schedules outside of normal work hours, and increasing the availability of classes in English as a Second Language (ESL).

People with Disabilities and Seniors

Moderator: Ray Petty, Kansas Coordinator, ADA Project.

Suzanne Dunn, Director of Product Design for the R. Jan LeCroy Center for Educational Telecommunications in the Dallas County Community College District,[5] described hurdles that face the senior workforce. First, she noted that seniors are overlooked by employers who do not see the need to consider them, even though by 2010 one of every five workers will be 55 years of age or older. A second hurdle is workplace ageism, a set of myths and stereotypical images about older workers (such as their not being as creative or productive as younger workers). Unequal access to ongoing training opportunities is yet another hurdle. The last hurdle is the use of age-inappropriate training methodologies.

From left, discussing IT access for seniors and people with disabilities are panelists Suzanne Dunn, Debra Holcomb, Janice Branwell, David Baker, and moderator Ray Petty.

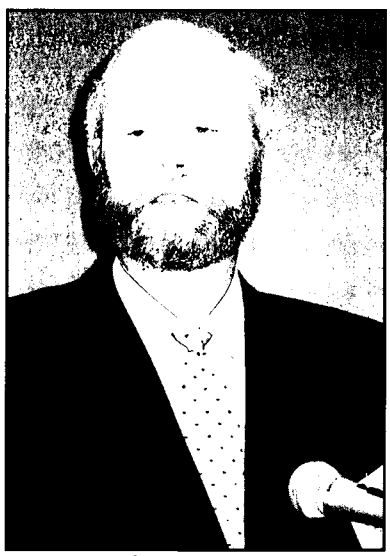
Janice S. Bramwell, State Project Director for the Missouri Green Thumb, Inc.,[6] followed with additional remarks about the senior workforce. She began by describing the operations and goals of Green Thumb, which began in 1965 as a pilot project to provide services to older workers. Green Thumb has added many additional services and has also developed a national awards program to recognize both senior employees and employers who hire older workers. The goal of this program is to increase awareness of older workers and emphasize the need to keep them in the workforce. Over the last three years nationwide, Green Thumb has trained more than 800 older workers in the field of technology, primarily at introductory levels. This program confirmed that seniors were more successful at training when enrolled in smaller classes and when instructed by their peers. In these settings, the older workers and their employers worked together to determine their needs and to develop curricula. Ms. Bramwell noted that seniors retained instruction well but feared taking timed exams. There were also challenges in training lower income older workers because of their lack of access to computers for practice.

Debra Holcomb, State Project Director for the Nebraska Green Thumb, Inc., discussed the operations of Green Thumb's Rural Revitalization through Technology Project (RRT), which is funded by the U.S. Department of Labor. Through this initiative, Green Thumb provides new training and employment opportunities for residents of rural America, with an emphasis on those most in need (including seniors, welfare participants, dislocated workers, displaced homemakers, and other unemployed and underemployed individuals). RRT also assists in addressing the need for IT workers; revitalizing rural communities; promoting the start-up and expansion of rural, home-based businesses and cooperatives; encouraging the expansion of new technology into rural areas; developing innovative strategic alliances that promote these goals and involve public/private partnerships; and providing knowledge and experience that will enable Green Thumb to establish a highly successful and replicable national model for revitalizing rural America.

David Baker, Program Coordinator for Missouri Assistive Technology,[7] provided insight into IT workforce opportunities for persons with disabilities. The Assistive Technology program is federally funded and provides new opportunities to people with disabilities in their communities, using technology as the tool to do so. "Assistive technology" is any item, equipment, or product system that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. Many of the same workplace barriers faced by seniors are also impediments to persons with disabilities, but infrastructure access, both physical and programmatic, is the primary barrier to IT. Mr. Baker used the analogy of a "digital divide within a digital divide" to describe the lack of program access to those with disabilities. Many IT workers are still unaware of assistive technology; if knowledgeable, they have developed a fear of the tool. Adaptations for the disabled to participate in the digital economy are generally easy to implement. At Workforce Investment Act One-Stop Career Centers in Missouri, officials have found that it costs about $6,500 to implement assistive technology to adapt the centers for about 90 percent of the disabled. This is indicative of the small price to pay for adaptation versus the cost of welfare, food stamps, and other financial aids for the unemployed.

Luncheon Keynote Address

Mark R. Drabenstott, Vice President and Director of the Center for the Study of Rural America at the Federal Reserve Bank of Kansas City,[8] set the stage for the afternoon sessions with his analysis of opportunities for rural and inner city America in the digital age. In remarks entitled "The Digital Economy: New Frontier for City and Countryside," he spoke about a new paradigm, a new imperative, and a new policy framework for the new economy. The industrial economy favored central cities, and the post-industrial economy now favors the suburbs, which have attracted the best workforce, retail assortment, services, and schools. However, the digital economy offers a new paradigm of knowledge-based industries that can be located anywhere, thus providing new opportunities for inner cities and rural areas. Mr. Drabenstott called this new policy framework a global renaissance in regional economic policy. It focuses on place—not sector; collaboration—not one firm; and regional competitiveness—not one-size-fits-all. It relies on clusters and networks as well as on information and communications technology. He described the new world of nutraceuticals as an example of this policy. Seizing digital opportunities for rural areas and inner cities requires not only broadband connections but also a savvy workforce, new e-business, equity capital, and an improved quality of life. He closed by saying that in thinking about the future of rural America in a digital age, the frontier is different from 100 years ago, but the challenges may be the same.



Keynote speaker Mark R. Drabenstott analyzed the economic opportunities for rural and inner city America in the digital age.

Afternoon Panel Discussions: "Providing Economic Opportunity for Rural and Inner City Communities in a Digital Era"

These concurrent sessions examined the barriers faced by members of rural areas (including Native Americans) and lower income, inner city communities to obtaining good 21st Century IT jobs. The goal of these sessions was to identify actions needed to overcome these barriers and define the skills and training needed.

Rural Communities

Moderator: Mark R. Drabenstott, Vice President and Director of the Center for the Study of Rural America at the Federal Reserve Bank of Kansas City.

Evans Craig, Owner of Internet Technology Service, LLC, and Internet Technology Consultant,[9] called his remarks "The Choice of Utilizing Technology in Native America." He discussed his current involvement with the education, outreach, and training of Native Americans through the Albuquerque High Performance Computing Center at the University of New Mexico. He stressed the importance of exposing these individuals to the capabilities and career opportunities in the high tech industry. For Native Americans, as for other groups of the population, technology must be relevant to their daily lives in order for them to utilize it. Outlining an approach now used with 32 tribal colleges, Mr. Craig described how students were taken to conferences and shown the various uses of IT. Language, according to Mr. Craig, is a major barrier to the understanding of technology for Native American communities. Their native language does not have words for technical terms, making it difficult to teach a class in technology when there is no translation for the concepts. The key to teaching this community is in relating IT to its cultural values. Mr. Craig suggested that this community could be taught by placing tribal schools,

Evans Craig, owner of Internet Technology Service, LLC, introduced a Native American perspective to the afternoon panel.

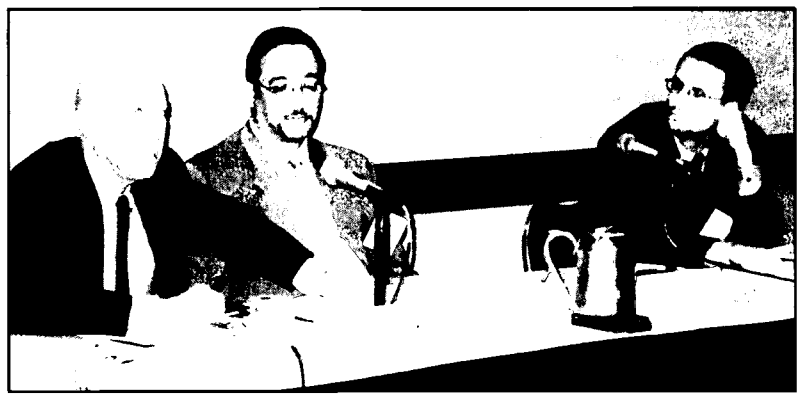
colleges, and Native American businesses online, thus enabling communication through the community and its elders. Understanding the importance of IT can occur only through forms of communication that are familiar to these groups, through exposure and meaningful exchange.

Ron Wilson, Director of the Huck Boyd National Institute for Rural Development at Kansas State University,[10] addressed how to provide economic opportunity for rural communities in a digital era. He began by saying that the regions of rural America vary greatly. For example, rural poverty and chronic unemployment are key problems in Appalachia and the Deep South; in Midwestern rural areas, the problems are brain drain, underemployment, and out-migration. A major issue in rural job development is providing training. Because rural areas are sparsely populated, it is difficult to create critical mass and to reach the target audience in remote areas. Mr. Wilson also cited the lack of use and interest in technology. Among his conclusions, he said that there is a primary need for local/regional/community leadership development to proactively champion opportunities for the new economy through IT. He cited four successful and failed rural entrepreneurial ventures as case studies to underscore this point. In one innovative approach, the Sedgwick County, Kansas, Extension Service has established a new Extension Agent position to focus strictly on technology and community development.

Inner City Communities

Moderator: David Saunier, Chief Net Officer, One Economy Corporation (also a **panel speaker**).

David Saunier, Chief Net Officer for One Economy Corporation,[11] described how One Economy has assisted in creating linkages to service programs via technology for those who live in lower income, inner city communities. Mr. Saunier identified the principal barrier to good IT jobs for inner city residents as being a lack of three things: culture of use, access to technology, and formal and informal support networks. He cited his nonprofit company as one that is trying to



Inner city populations are faced with barriers and opportunities when seeking IT training and jobs, according to panelists (from left) Herman Wallace, Clyde McQueen, and David Saunier.

address these barriers by aggregating Internet content that is both relevant and tailored to the needs of low income people. One Economy's goal is to help people help themselves to increase their wealth and standard of living. Working with nonprofit housing providers, One Economy is trying to create a culture of use by providing access to technology in the privacy and comfort of the home. The company advocates increased access to technology training and education through its Beehive Website, community technology centers, and other programs. They also recognize that technology needs to be used to create linkages to on-the-ground training and placement service programs. To pursue IT jobs, typical lower income, inner city residents need to learn both computer skills (basic and advanced) and soft skills (e.g., writing résumés and interviewing).

Clyde McQueen, President and CEO of the Full Employment Council,[12] focused on the barriers and opportunities for urban populations to take advantage of IT jobs. He began with a description of his agency, which provides job training and employment services to 10,000 minority and low income people within the Kansas City urban core. Mr. McQueen pointed out that the urban poor population generally is unfamiliar with IT jobs, and there is a great need to provide exposure and information to demystify the field. Because of the lack of exposure, this population has had little interaction with those in IT jobs. As a result, the urban poor do not appreciate the true value of IT and its importance in today's labor market—that all jobs have an IT component. With respect to skill needs, Mr. McQueen echoed what others said about the need for basic keyboarding as well as social and workplace skills. In concluding his remarks, he noted that those who administer job training programs must adjust their program delivery to enable people to "earn while they learn."

Herman Wallace, Associate Regional Administrator for the U.S. Department of Labor, Employment and Training Administration (ETA), Region V, discussed his agency's role in workforce development, focusing on issues related to training inner city youth for IT jobs. As part of its youth initiative, ETA runs 118 Job Corps centers nationwide, serving 60,000 economically disadvantaged youths annually. These centers are set up as campus settings where participants are expected to be computer-literate within 90 days of arrival. Each center has an advisory employer committee that provides input on the computer courses needed, and most centers are linked to local high schools that participants attend until graduation. Mr. Wallace spoke of his staff's experience in operating a pilot computer camp for inner city youth. The staff thought they would have to teach participants how to use a computer but quickly learned that the youths already knew how to use the computer to play games; what they lacked were the basic spelling and grammar skills needed to communicate effectively. Mr. Wallace also pointed out that, too often with this population, negatives are highlighted rather than positives. For example, there is a tendency to talk about a high unemployment rate of 5.7 percent, but not that the employment rate is over 94 percent. He concluded by saying that numerous organizations have established computer learning centers, and there are opportunities in the workforce. However, the challenge is getting people to understand that these opportunities will work for them.

The information and insights gained from these panelists and the resulting discussions have been synthesized and are presented in the next three sections of the report.

The Scope of the Underserved

The DEOC-sponsored Kansas City conference focused on members of the population that have been traditionally underrepresented in the IT workforce and less connected to information technology. These are women, minorities (especially African Americans and Latinos), people with disabilities, seniors, and Native Americans as well as residents of rural and inner city, low income communities.

> Internet use has expanded dramatically, but a number of groups are more likely not to be Internet users: low income families, less educated adults, Hispanics, and Blacks.
> —*National Telecommunications and Information Administration (NTIA), "A Nation Online: How Americans Are Expanding Their Use of the Internet," February 2002*

The IT World Is a White Male World

In opening the panel on women and minorities, Katherine Hanson of the Education Development Center quoted a *Wired* magazine study performed for Cisco Systems. It found that 90 percent of all those keeping the Internet system going are male and that a majority are white.

Not surprisingly, the situation is similar for the education pipeline. Ms. Hanson reported that from 1977 to 1995 there was almost no change in the number of bachelor degrees in computer science and mathematics for underrepresented groups.

Older Population and Workforce Are Growing and More Connected

America's older population is growing larger as is the senior workforce. The number of seniors using the Internet is also increasing.[13]

- As of 2000, the 55+-age population represented about 21 percent of the U.S. population (59.3 million of 281.4 million).

Fifty-two percent of senior households 55 to 64 years old and 27 percent 65+ years old are connected to the Internet... increases of 20 and 25 percent respectively from a year earlier.
—*ComScore Networks Study, May 2001*

- By 2030, the population aged 65+ is expected to increase from 33 million to more than 70 million.
- As of 2000, the 55+-age population in the workforce was 12.5 percent (17.3 million of 140.9 million).
- By 2006, more than 15 percent of the U.S. labor force is projected to be 55+ years old.

People with Disabilities Are the Most Underrepresented and Least Connected

Whether talking about computer use, Internet access, or employment levels, people with disabilities are probably the most overlooked and least engaged in IT.

About 70 percent of people with disabilities are unemployed, although 70 to 80 percent of those would like to have a job.[14] Within this group, women and girls are particularly disadvantaged, and most disabled women do not get advanced degrees or enter the workforce. People of color are similarly disadvantaged.[15]

Rural IT Access and Employment Still Lag

"...even when income, education, and age are accounted for, people with disabilities (blindness, deafness, or difficulty in walking, typing, leaving home) are less likely than those without disabilities to be Internet users."
—*NTIA, A Nation Online*

While NTIA reported that Internet access for rural households has grown substantially and, in 2001, was almost even with the national rate, rural areas still lag in connectivity. The rallying cry in rural America is now access to broadband connections. Broadband is available from 86 percent of the largest local telephone companies in communities with more than 250,000 residents but is available from less than 5 percent of companies serving communities of fewer than 25,000.[16]

Rural poverty and chronic unemployment are key obstacles in some parts of rural America such as Appalachia and the Deep South. In Midwestern rural America, the issues are not so much unemployment as they are underemployment, brain drain, and out-migration.[17] Employment growth in rural areas is also an issue because it has been declining in recent years compared to urban areas.[18]

Low Income Communities Are Isolated

An estimated 35 million to 45 million people in America exist outside the economic mainstream because they live in poverty, are unemployed, or lack access to basic financial services such as checking accounts. The much-discussed digital divide simply is the current manifestation of the long-standing issue of poverty and the gulf that exists between the "haves" and the "have-nots." While factors contributing to poverty vary by individual, social and economic isolation is a common thread. Low income people simply are not part of a network of connections that brings them into the mainstream. This isolation blocks them from financial services that enable them to save and from jobs that provide a living wage with health benefits.[19]

> Low income people simply are not part of a network of connections.
>
> —*David Saunier, One Economy Corporation*

Barriers to Participation in the New Economy

All the panels at the Kansas City conference addressed the barriers to obtaining jobs in the new economy. A set of common factors emerged that seem to apply to all of the underserved populations as well as a number of factors that are unique to particular groups. These barriers have been organized and defined as:

Cultural/social–issues in the groups' family or work environment, both real and perceived, that inhibit full participation.

Technological–absence of hardware/software needed to obtain access or gain IT and related skills.

Educational–inappropriate teaching methods or inadequate educational preparation that hinders the learning needed to pursue IT careers.

Opportunity/choice–lack of opportunities and information for entry into IT fields.

Structural–specific barriers that are inherent to a group and unique to it.

Cultural and Social Barriers

All of the underserved groups face similar cultural and social barriers involving stereotypes, workplace norms, and isolation that have reduced their levels of participation in the IT world.

Stereotypes

Women and girls see the information-communication technology field as a male world, one that does not reflect their interests.
—*Katherine Hanson, EDC*

Many groups face issues of stereotype. Women and girls see the IT field as a male world, one that does not reflect their interests. There is a "nerd/genius" stereotype that suggests to women that if they are not nerds or geniuses, this is not a field for them. It also is a field linked to mathematics, a field that women have historically not been encouraged to enter.

A major cultural hurdle for seniors, according to Dr. Suzanne Dunn, is workplace ageism: a set of myths and stereotypical images about older workers in all jobs, including IT. These myths include:

- Older workers are not as creative or as productive as younger workers.
- Older workers are ill more often than younger workers.
- Older workers are less flexible and adaptable than younger workers.
- Even if older workers can learn, retraining them is not cost-effective because they do not stay on the job for very long.
- Older workers find it hard to take orders from younger workers, and younger workers do not like to give orders to people old enough to be their parents.
- Older workers cost more than younger workers.

Similar stereotypical images are also generally applied to people with disabilities.

Workplace Norms

The workplace itself can be a negative barrier for women; many work environments not only do not support entry into the IT field but also can be unwelcoming and even hostile.[20] Many African Americans who complete the education and training pipeline then must face a corporate culture in the workplace that does not provide opportunities for success.

Many low income and recently immigrated Latinos are unfamiliar with mainstream culture in this country, including an understanding of what is expected in the workplace. Many families have come from rural communities and countries where computer usage is not the norm. Therefore, potential workers lack both familiarity with and formal education in technology. [21]

Older workers face a number of hurdles, including the fact that many companies do not hire or recruit older workers. This is shown in several recent surveys. A Louis Harris & Associates Laborforce 2000 Survey showed that 40 percent of responding companies said that they avoid hiring older workers. A SHRM/AARP Older Workers Survey found that only 30 percent of respondents actively recruit older workers.[22]

Isolation

Cultural and social isolation is an important inhibiting factor within rural and lower income, inner city communities. In inner city communities, the use of computers and technology is not a part of daily life for many low income residents. There are limited formal or informal networks in the community to support IT involvement. Moreover, there is less exposure to information about IT jobs that would demystify the field and create an appreciation of and interest in IT jobs. Many residents of rural communities face similar problems of social isolation and lack of support.

Introducing technology to many Native Americans, particularly on reservations, involves an added dimension. Unless technology can be shown to be culturally relevant to the tribe, members neither see nor understand its use or value and will not embrace it.[23]

> Twenty-five percent of NAM survey respondents in 2001 reported a greater willingness to hire immigrants, high-school students, people moving from welfare, and retired workers.
>
> —*National Association of Manufacturers (NAM), The Skills Gap 2001*

Technology Access Barriers

While access to computers and the Internet is becoming less of an issue, it still remains one for certain populations. The lack of racially or culturally relevant Internet content is also a possible problem.

Lack of Access

Large numbers of seniors and people with disabilities have problems accessing standard computer hardware, software, and Websites because of particular impairments (e.g., vision, hearing, dexterity, or mobility). This issue of program access has created a digital divide within a digital divide; even in this age of technology, many IT workers are not aware of assistive technology that is available. When they are aware of it, many are reluctant to use it.

As noted previously, even with national access rates at record high levels, access to computers and the Internet is lower for members of certain communities, particularly those who are disabled, lower income, rural, or inner city. In many cases, the cost of the technology alone is prohibitive. In others, the hindrance is isolation, both physical and social. In studies of Internet use by rural Kansas community leaders, 10 percent of respondents said they would never use the Internet.[24] Among the reasons cited were:

- No computer or cannot operate it (49.1 percent).
- Unfamiliar with the Internet (26.2 percent).
- No training (25.7 percent).
- Cost of Internet (24.7 percent).
- Cost of long distance calls to access (21 percent).

Green Thumb has found that few lower income, older workers have computers in their homes, making it difficult for those taking IT training courses to practice and do assigned exercises outside of class.

Inadequate Relevant Web Content

In addition to lagging behind the national rate of computer ownership and Internet access, African Americans do not see themselves in the Internet world because it does not contain content of interest or value to them.[25] A similar lack of interest exists for Native American tribes because of a lack of relevance. Until recently, there has been little Internet content developed by Native Americans for Native Americans.[26]

Educational Barriers

Education is another key factor. The teaching approaches used in technology and computing training can be a barrier as can the educational content.

Inappropriate Teaching Methodologies

Computer courses are often taught separately and out of context from other subjects. Learning under this approach can be difficult for women, who tend to need connections to language, writing, and other parts of their lives to be successful.[27]

There are also false assumptions made about the linear order in which technology must be taught–that A must be learned before B in order to move on to C. In the Breaking Barriers program at EDC, instructors discovered that immigrant women from Central and South America in an ESL program learned to navigate the Internet and use a computer within one hour. The ESL teachers were surprised because they believed that a certain level of literacy and set of skills were necessary to use a computer and find information.

> E-learning technology is difficult to use for those without computer skills.
> —*Katherine Hanson, EDC*

E-learning has become a growing method for providing and supplementing adult training. However, e-learning technology is difficult to use for those who do not already have computer skills. Research has revealed several things about the use of e-learning:

- People taking e-learning courses are predominantly white.
- There is a learning curve to e-learning, both in using the hardware and software and in mastering the content.
- The content of many courses is not structured to meet the needs of students, leading to reduced interest.[28]

For older workers, many training methodologies are age-inappropriate. The use of one-size-fits-all training courses often is ineffective for these workers because of differences in psychological needs, physical limitations, and learning styles. Timed tests and hypothetical tasks are examples of inappropriate methods for older workers. Older workers do not perform well in larger classroom training settings. The most

successful programs appear to have classes of no more than 10 to 12 students using instructors who are peers.

Poor Quality of Education

Seventy-eight percent of NAM members surveyed believe that despite a decade of education reform movements, the public schools are not preparing students for the workforce. The biggest deficiency is teaching basic academic and employability skills.
—NAM, The Skills Gap 2001

A lack of quality education is a key factor for the African American community. Without adequate levels and numbers of math and science courses, fewer students enter engineering schools and programs. A more fundamental problem is the lack of reading skills among African American children. While inner city youths had the skills to readily go on the Internet and play games, many did not have the basic spelling and grammar skills necessary to communicate effectively.[29]

Teacher quality is another issue. Certainly in inner city and minority community school systems, there is a lack of qualified teachers, especially in math and science. Likewise, student test scores in reading, math, and science are low. While there are many talented and qualified teachers in inner city schools, there are too many who are not. There is also a lack of role models and mentors to develop and raise student interest in IT careers.

Barriers to Opportunity

The last set of common barriers are those that prevent or limit entry or job growth in the IT field because of the lack of opportunity or information.

Limited Choices and Information

Many members of underserved segments of the population do not pursue the IT field because they simply do not know enough about it to do so. Barriers to opportunity for women and minorities include:

- Not knowing how to get into an IT profession and being unaware of options.
- When taking training courses, the multiple roles of many women (mother, homemaker, worker) that detract from their ability to

focus on training in the classroom.

- Lack of training funds.
- Workplaces that are not career-oriented and do not provide options or opportunities to get into growing work areas.

A related factor is that many students form career choices in high school but do not have parents or counselors who are knowledgeable about IT careers. Consequently, there is a lack of influence and encouragement to seek opportunities in this field.

> Women and minorities don't know how to get into an IT profession; they are not aware of their options.
>
> *—Rory Paredes, Center for Applied Technology, Graduate School, USDA*

Lack of Training Opportunities

Another barrier is unequal access to ongoing training opportunities. Older employees, for example, are often refused training opportunities even though they are working in companies that value maintaining and improving skills. Companies that accept ageism myths about older workers often discourage them from participating in training opportunities that would keep their skills up-to-date. This sets up a self-fulfilling prophecy: by denying them training, management creates a depressing work environment that discourages high quality and productivity.

Many older job training programs were developed on the assumption that a person could go to school full time, Monday through Friday. This is clearly not the case in the 21st Century. Many people have others they must support and thus cannot afford to attend school full time. In response, job training organizations have had to make adjustments in their training program delivery to allow people the opportunity to "earn while they learn."[30]

Structural Barriers

There are also structural barriers that are inherent in certain populations and unique to them. These include such things as language, cognitive skill, disability, and remoteness.

Language

Latinos, as well as other recent non-English speaking immigrants, face a language barrier as they seek both employment and training services. As pointed out in the DEOC's first report, a fundamental level of basic literacy is necessary to develop or upgrade IT skills. Language can also be a major problem in some Native American communities. Because much of the Native American language is culture-based, it is difficult to teach classes in technology when there are no translations for the concepts. In one tribe, the translation for the word "electricity" is "a tree that hums," derived from the humming of electric lines suspended from poles on the reservations.[31]

Transience

Many workers in rural areas as well as inner cities do not have permanent residences; these include migrant workers and workers in industries where high levels of turnover exist, including the rural-based meat packing and poultry industries. The transient nature of these populations makes it difficult to provide education and training programs. E-learning programs hold some hope for addressing this.

Disabilities

People with disabilities and many seniors have physical and cognitive disabilities that hinder training in and use of technology. Such barriers can usually be overcome with accommodations. Obviously, persons with physical impairments can take a computer class only if they can access the building or the program.

Remoteness

People in rural communities suffer from physical remoteness. Major training challenges exist in rural areas because of the need to attract enough students to make training classes feasible and to reach nontraditional students on their turf and schedules. Remoteness also factors into the availability and cost of getting connected.

Solutions for Broader Inclusion

Conference participants identified a number of possible solutions on how to provide greater participation in the IT workforce for members of underserved communities. Solutions include improved education, increased public awareness and information, enhanced motivation and support, the fostering of leadership and partnerships, encouragement of employer participation, and the involvement of government.

Improve the educational foundation for students and workers.

Stated bluntly, there is a need to have quality education and high academic standards for all students. How best to do this has been a subject of national debate for some time; however, there seems to be general consensus that bold, comprehensive steps are needed.

In the K-12 educational system, there is a specific need in technology to increase the connection to programs and subjects that appeal to girls and minorities so that equal opportunities are provided for all students. Relevance needs to be shown at an early age so that students will embrace technology and the academic curriculum needed to pursue IT professions.

A worker's language barrier can be overcome in a variety of ways. More ESL classes need to be provided to enable immigrants to learn English so they can pursue good jobs. Some employers are now taking Spanish classes to enable them to better communicate with Spanish-speaking workers. To shorten the learning curve, another short-term response to dealing with the language barrier is to provide computer classes in languages other than English.

As was noted in the DEOC's first report, basic job skills programs are needed to help with job entry and workplace culture issues. Workers'

> "No single reading, math, or science reform, implemented in isolation, will equip students with the knowledge and skills needed to enter the IT workforce or succeed in other challenging, high demand occupations. Instead, American schools must make large-scale and dramatic improvements in what they teach students and how they teach them."
>
> —*21st Century Workforce Commission, A Nation of Opportunity*

needs range from learning how to use a computer and how to write a résumé and interview for a job to workplace basics such as punctuality and answering a telephone. Very basic skills such as keyboarding, learning to work in teams, and problem solving also must be taught.

Part of improving the educational foundation includes recognition of the importance of lifelong learning in today's working world. Both employers and employees need to place greater value on training and to view it as a vital component of the workload. Training should not be viewed as a perk or something to be done when time permits.

Another need is for greater access to computer training and education. This is certainly the case in inner city and rural communities where physical and social isolation plays a key role in the lack of opportunities. In both environments, there is a need to reach out to potential workers and to provide access on their own turf.

Increase awareness of and information about workers from underrepresented populations.

The IT industry needs to be educated about changing the workplace environment to provide greater gender and diversity equity. As Katherine Hanson put it, "we cannot just tell them and they will come; we need to understand the gender and diversity implications and we need to address them directly." The U.S. Environmental Protection Agency in Kansas City is an organization that is taking steps to change its culture. It has actively recruited at minority institutions, entered into memoranda of understanding with Native American and African American institutions, implemented diversity awareness programs, and brought in technologists to speak.

Green Thumb (Experience Works) Prime Time Awards Program salutes America's senior workforce.

Green Thumb uses recognition programs to increase awareness by employers of the value of older workers. Its Prime Time Awards recognize older workers' contributions, and Green Thumb also highlights employers who employ older workers.

While mathematics is important to an IT career, employers must recognize that logic and critical thinking also are needed for success. Employers must not overlook a female or minority candidate who lacks mathematics credentials but can demonstrate the ability to apply logic and think critically.

One of the goals of Missouri Assistive Technology has been to develop assistive technology standards for use in Missouri's One-Stop Career Centers. Officials have found that workplace adaptations for the disabled are generally inexpensive ($6,500 per center) and easy to implement. Because One-Stops are places where employers and employees come together, an intended outcome of adapting the centers is that employers will become exposed to assistive technology and begin making it part of their company culture.

There is a need to heighten awareness of the changes taking place in our workforce pool. From a business perspective, there is a need for more than awareness–there is a need for hard data. Without financial data on the productivity of older or disabled workers, for example, corporations will be less likely to hire or train them. In this regard, part of the problem in the United States is that we tend to be reactive rather than proactive. We wait for a problem to develop, then react and set out to gather data about it.[32]

Motivate members of underrepresented populations to pursue IT jobs and then provide support to them.

Increased motivation can help children perform better. Parents, teachers, and counselors need to raise expectations for children to perform well academically and encourage them to take math and science courses. The adults also need to serve as role models and mentors for their children.

Motivation is a critical issue in rural areas, including Native American communities. To motivate students at Southwestern tribal colleges, the schools invited students to technology conferences to see current and potential technology.

Similarly, in other rural areas where brain drain and out-migration of young people are critical problems, there is not only a need to provide better access to technology but also to motivate people to return and become involved in e-business and other entrepreneurial ventures. The growth of technology in rural areas enables those who prefer rural lifestyles and amenities to enjoy them.

The Graduate School, USDA, has developed a pilot training program, called the Certified Webmasters Program, in which women

> Once motivated, Native Americans need mentoring and government support, especially in business development, because they have the lowest number of entrepreneurs of any minority group.
>
> *—Olga Kharif, Native Americans Stake a High-Tech Claim (BusinessWeek Online)*

and minorities are encouraged and trained to become certified Webmasters. The program's success has been due partly to the fact that it offers career counseling, support, and mentoring as well as instructors who are supportive of their students.

Employers, as well as other job-training organizations, can take actions to assist workers and their families in many ways. For example, they can:

- Make accommodations to workers by providing access to technology and modifying work schedules to enable them to take advantage of social and job training services.
- Increase access to training outside of normal hours by assisting with childcare, stipends, etc.
- Provide assistance with job searches once training is completed.

The One Economy Corporation uses technology to motivate and support low income, inner city residents to help raise their wealth and standard of living. It brings technology to this population by developing and consolidating content that is relevant to them–very basic information on financial, employment, and other related services–and providing it in residents' homes. It also is trying to increase awareness of and motivation about pursuing IT jobs.

Foster enlightened leadership and form partnerships to increase opportunities.

The provision of opportunities and the achievement of success in IT workforce development efforts are highly dependent upon an engaged community leadership and the strength of the partnerships that are formed. In rural communities, a primary need is for local/regional/community leadership to champion proactively the opportunities for the new economy through IT. Leaders need the vision to think about the possibilities and innovative ways for bringing together community and industry leaders to find solutions. These could include community and industry support for educational programs, new infrastructure, and the involvement of local community colleges in workforce development programs. One result of attracting back those who have left rural areas is that they often return with a broader

perspective and vision and an entrepreneurial spirit. Similarly, in Native American communities it is important to help the elders, who are the tribal leadership, to see the importance of technology so that they will embrace it.

Colleges and universities, including community colleges, are involved in community and business partnerships and are a potential source of leadership for IT workforce development. Many are involved in projects such as the U.S. Department of Education's Gear-Up, which is designed to encourage students from schools in low income areas to start on the path to college. A project of the University of Texas encourages Latino students to consider engineering, math, and technical careers. In contrast to such efforts, many community colleges in rural areas suffer from turf battles and an inability to alter traditional educational roles. Such problems hinder development of the training needed to bring rural residents into the 21st Century.

Several innovative approaches of institutional leadership exist that can bring the opportunities of technology closer to isolated communities, rural or urban. The Sedgwick County, Kansas, Extension Service has implemented a unique application of the Agricultural Extension Agent position. The traditional role of the Extension Agent is to take research out to the community, especially in areas such as agriculture, family and consumer sciences, 4-H and youth, and community development. Sedgwick County has created a new position, called the Technology and Community Development Agent, whose purpose is to provide technology education and outreach to local communities.

In 1991, Minnesota created a new technology-based economic development organization called Minnesota Technology Inc. Its mission is to help existing small and medium-sized companies apply, develop, and commercialize technology. Its goals are to diversify the greater Minnesota economy, promote the technology community in Minnesota, and provide leadership in public policy discussions.

The North Central Kansas Community Network is an Internet virtual community that was formed in the mid 1990s. Its purpose is to link rural communities in the area by providing information and resources on a broad range of everyday services, such as education, jobs, businesses, libraries, and medical needs. Their success in creating

The United Food and Commercial Workers Training Centre in Winnipeg, Canada, which was highlighted at the DEOC's Boston conference, is a successful partnership that has been providing training to workers. Funded by the Training Trust Fund, which is supported by employer contributions, the center has a partnership of 55 companies, colleges, and government.

this network of support was attributed to the regional approach taken and the partnerships that were formed.

Encourage employers to develop and participate in initiatives that broaden access to the IT field.

Companies can initiate and implement programs to foster and expand opportunities for women, minorities, students, and current workers, who can use the programs to develop or enhance IT skills. Examples include:

- Special programs to recruit and train new workers from specific target populations.
- Company-sponsored summer enrichment programs for teachers and students.
- Work-focused IT, science, and engineering projects.
- Work experience programs.

Employers can make accommodations to help attract and retain certain underrepresented populations. Providing assistive computer technology to people with disabilities is a clear example. Other actions could include having key workplace-related documents (e.g., employment information, orientation materials, and workplace policies) translated into other languages, especially where companies are located in communities with large non-English speaking populations.

The *Washington Post*, as part of its Young Journalists Development Project, formed a partnership with the Washington Association of Black Journalists to give minority high school students an introduction to careers in journalism. The program, which involves a series of workshops, hands-on projects, and professional mentors, is an example of a business-led minority education and outreach program.

Involve government in helping prospective workers from minority populations.

In areas such as education and workforce development, the traditional view of the government's role is to provide money. However, government can fill vital leadership and partnership roles in other areas.

Alternative roles for government include:

- Reviewing residency requirements for job training and assistance programs.
- Providing employer incentives to train and retain current workers.
- Encouraging the merger of public and private resources to leverage available training resources.
- Proposing and advocating increased funding for job training programs that work.
- Reviewing program requirements and policies to ensure that they provide equal access to the intended target audience.
- Fostering policies and programs that support economic and workforce development, especially involving IT.

None of these solutions alone can increase the level of underserved and underrepresented populations in the IT workforce. All are interrelated. The conference clearly points to the need for a comprehensive approach to help these populations overcome existing barriers. Such an approach must:

- Increase awareness about the nature of workers' abilities and needs.
- Increase training and educational opportunities.
- Provide motivation, support, and assistance.
- Foster enlightened community leadership and partnerships.
- Engage employers.
- Involve government.

"There are many ways to engage a problem. Not all of them are governmental; many of them involve governmental resources. Most of them involve cooperative activities between the public and private sector."

—Elliot Maxwell, Office of the Secretary of Commerce, at the Athena Alliance Conference, October 2001

Summary and Next Steps

Where We Are

As stated in the introduction, the DEOC's goal is to examine the digital divide in IT skills and make recommendations to close it. The question is what needs to be done to ensure that the U.S. economy has a sufficient supply of skilled IT workers to meet its needs? The DEOC is addressing this question by seeking ways to:

- Assess workforce IT training and educational needs.
- Increase and improve IT education, training, and instruction.
- Expand resources for employee training.
- Attract and train women, minorities, and other nontraditional groups to enter IT fields.
- Involve IT workers in teaching, mentoring, and working with students in local school systems.
- Partner among business, labor, education, and community to address IT training and educational needs.
- Remove barriers to IT jobs for members of underrepresented groups, especially low income and rural communities.

The digital divide that the DEOC is addressing in this research effort is defined by the IT skills gap–between those who have the skills and those who do not–and the opportunity to gain the skills to successfully compete for good jobs in the new economy. It is not about the digital divide in computer ownership and Internet access, although that is still an important issue for many in our society.

The DEOC's assessment so far makes it clear that the issue of the IT skills gap is multifaceted. The DEOC has recognized that many, if not most, of the new economy jobs have technology components. Therefore, there is a broader need for IT literacy training, especially for workers who have been in the workforce for some time. To provide this, the current system for adult training needs to be expanded and improved to meet the training needs of the new economy. The first DEOC conference (held in Boston) and its first report focused on how to do this.

In this second report, the DEOC has focused on increasing the pool of skilled IT workers by tapping into and training populations that have historically not been represented in the IT workforce. These include women, minorities, seniors, people with disabilities, Native Americans, and those living in rural and low income inner city communities.

At the conference in Kansas City, a series of cultural/social, technological, educational, opportunity, and structural barriers were identified that have hindered and discouraged participation in the IT workforce. These include stereotypical images about certain groups, social and physical isolation, lack of computer access and non-relevant Internet content, inappropriate teaching methods and mediocre education, lack of information and training opportunities, language, and disabilities.

Key solutions for overcoming these barriers include:

- Improving the educational foundation for students and workers.
- Increasing public and employer awareness of and information about workers from underrepresented populations.
- Motivating and supporting members of these groups to pursue IT jobs.
- Encouraging enlightened leadership and the formation of partnerships.
- Developing and participating in initiatives to broaden participation in the IT field.
- Involving government.

The Next Steps

The DEOC is examining these issues through a series of committee meetings, regional conferences, and publications over an 18-month period. Between April 2002 and the conclusion of the project in June 2002, the DEOC will hold a series of meetings in San Francisco, Lexington, KY, Chicago, and Washington, DC, to present its recommendations.

April 2002	The final conference and a committee meeting will be held in San Francisco on April 17. This will provide a forum for the presentation and discussion of the DEOC's draft final recommendations.
May 2002	NPA and the DEOC have been invited to present the DEOC's findings and recommendations at the Lexington, KY, Community Action Council annual conference on May 16 and then to the Federal Mediation and Conciliation Service's Eleventh National Labor-Management Conference in Chicago on May 30.
June 2002	The DEOC will announce its final findings and recommendations and release its final report at a news conference at the National Press Club in Washington, DC, on June 27.

Additional information about this research project and past and upcoming activities is available at NPA's Website (www.npa1.org).

Notes

1. National Policy Association. *Building a Digital Workforce, Part1: Raising Technological Skills* (Washington, DC: November 2001).

2. The Education Development Center, located in Newton, MA, is a leading nonprofit education and health organization. It brings practitioners and researchers together to create tools and conditions for learning, reaching people of all ages, backgrounds, and abilities.

3. The Graduate School, USDA, was established to provide career advancement opportunities for working adults in the public service sector. Annually it offers more than 1,500 courses nationwide to 150,000 students. It is a self-sustaining, independent organization.

4. El Centro is both a broad-based social services agency and an economic development corporation that serves the needs of more than 15,000 families a year in the Kansas City region.

5. The R. Jan LeCroy Center for Educational Telecommunications of the Dallas County Community College District is a leader in distance education, with an ongoing mission of developing instructional materials for delivery to an expanded and diverse audience of students.

6. Green Thumb is a national nonprofit organization whose mission is to strengthen families, communities, and the nation by providing older and disadvantaged individuals with opportunities to learn, work, and serve others. As of January 1, 2002, the organization changed its name to Experience Works.

7. The mission of Missouri Assistive Technology is to increase access to assistive technology for Missourians of all ages with all types of disabilities. Programs and initiatives of Missouri Assistive Technology are directed by the Missouri Assistive Technology Council, which was established by state statute in 1993.

8. The Center for the Study of Rural America, Federal Reserve Bank of Kansas City, has a mission to track farm and rural economies and to provide analysis of economic and policy issues.

41

9. Evans Craig is a Native American IT consultant. He has worked extensively to provide education, outreach, and training to tribes in the Northwest and Southwest U.S.

10. The Huck Boyd National Institute for Rural Development, Kansas State University, has a mission to develop rural leadership and self-help.

11. One Economy Corporation of Washington, DC, is a national, nonprofit company formed to use technology to motivate and support low income, inner city residents to help raise their wealth and standard of living.

12. The Full Employment Council, Inc., of Kansas City, MO, provides job training, education, economic development activities, transportation, youth development, and welfare-to-work services.

13. Janice S. Bramwell, Green Thumb, Inc., Buffalo, MO.

14. David Baker, Missouri Assistive Technology, Independence, MO.

15. Katherine Hanson, Education Development Center, Newton, MA.

16. Mark R. Drabenstott, Center for the Study of Rural America, Federal Reserve Bank of Kansas City, MO.

17. Ron Wilson, Huck Boyd National Institute for Rural Development, Kansas State University.

18. Mark Drabenstott, op. cit.

19. David Saunier, One Economy Corporation, Washington, DC.

20. Rory Paredes, Center for Applied Technology, Graduate School, USDA, Washington, DC.

21. Ian Bautista, El Centro, Inc., Kansas City, KS.

22. Dr. Suzanne Dunn, R. Jan LeCroy Center for Educational Telecommunications, Dallas County Community College District, Dallas, TX.

23. Evans Craig, Internet Technology Service, LLC, Albuquerque, NM.

24. Ron Wilson, op. cit.

25. Wanda Johnson, Water, Wetlands & Pesticides Division, U.S. Environmental Protection Agency, Kansas City, KS.

26. Evans Craig, op. cit.

27. Katherine Hanson, op. cit.

28. Ibid.

29. Herman Wallace, Associate Regional Administrator for the U.S. Department of Labor's Employment and Training Administration, Kansas City, MO.

30. Clyde McQueen, The Full Employment Council, Inc., Kansas City, MO.

31. Evans Craig, op. cit.

32. Dr. Suzanne Dunn, op. cit.

43

National Policy Association

The National Policy Association was founded in 1934 by distinguished business and labor leaders who believed that the private sector should actively participate in the formulation of public policy.

Since that time, NPA has been one of the nation's leading nonpartisan, nonprofit organizations promoting informed dialogue and independent research on critical economic and social problems facing the United States. NPA brings together influential business, labor, agricultural, and academic leaders to seek common ground on effective and innovative strategies that address issues vital to the prosperity of America. Through its committees, seminars, and conferences, NPA provides a broad-based arena for differing viewpoints and new insights on issues of national and international importance.

NPA-sponsored research and publications address fundamental questions related to strengthening U.S. competitiveness and productivity in a context of justice, equity, and basic human values as well as issues related to globalization and governance in an increasingly interdependent world. For more information, visit www.npa1.org.

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