

WORKING DRAFT

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**MEETING THE NEEDS OF THE DIGITAL WORKFORCE:
INFORMATION TECHNOLOGY JOB TRAINING
PROGRAMS FOR LOW-INCOME ADULTS**

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Changing Our World

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Introduction: The Information-Based Economy and What It Means for the Workforce

New technologies continue to transform at a rapid pace the most basic functions of our daily life in the home, classroom, and particularly the workplace.

The Commerce Department's report *Digital Economy 2000* found that the information technology (IT) industry is the number one driver of the American economy. As technology has taken center stage in the business arena, talent – or the shortage thereof – has emerged as a major issue in the digital economy. In 1998, the total number of workers in IT, both in the industry and in IT occupations in other industries, totaled 7.4 million, or 6.1 percent of all workers.ⁱ

However, last year employers tried to fill an estimated 1.6 million new IT jobs and struggled to grow because of the shortage of qualified workers.ⁱⁱ

H1B visas have been suggested as one way to address the shortage.ⁱⁱⁱ Another, more permanent solution is to train domestic workers for IT jobs. Community colleges and other educational institutions have started offering IT coursework and certification programs.^{iv} One of the better known educational/employer partnerships is the Cisco Networking Academy program, run by the hardware giant Cisco. Cisco partners with schools, colleges, and community-based organizations to train students and adults in designing, building, and maintaining computer networks. The 560-hour course prepares students for industry standard certifications like the Cisco Certified Network Associate and others. Community colleges now offer students industry standard certifications such as Cisco and A+ Certification as part of their course offerings. Also, community-based organizations and community colleges are partnering to provide IT training to low-income populations. A good example is the Glide Tech partnership in San Francisco, which

integrates skills training, career planning, and job placement.^v However, many community colleges and schools lack the flexibility necessary to stay abreast of technology changes and make the necessary curricula changes. Additionally, funding may be more restricted than that of nonprofit organizations.

Yet, another alternative to address the talent shortage are the IT job training programs that nonprofit, community-based organizations are operating for low-income adults. When asked about IT job training for low-income populations, Patricia Jenny, a program director at the New York Community Trust and leading funder of workforce development says that “information technology [as a field] sticks out there quite prominently because of the availability of jobs. IT has created a whole new function because every business now needs an IT person, either on staff or as a consultant.” IT jobs are attractive for job training programs and their participants because, in addition to the high demand in both the IT and non-IT sectors, the barriers of entry to the field are relatively low for program participants and many of the jobs have distinct career paths. Also, the IT industry is creating higher-paying jobs at a faster rate than other industries – the average salary for high tech jobs is \$58,000, which is 85 percent higher than the private sector average as a whole.^{vi}

This paper will provide an overview of nonprofit organizations engaged in IT job training, the characteristics shared by such groups, and offer strategies and ideas for foundations and other philanthropists to support this emerging field.^{vii} These programs are worth examining because of the unique role they play in training and moving low-income individuals to well paying, career-ladder jobs. Technology – and the jobs created by the information-based economy – has provided new opportunities for these programs and their clients, and their successes are worth examining.

Organizations Operating IT Job Training Programs

The Digital Workforce Alliance (DWA) is a good example of nonprofits providing IT job training to low-income adults. It was convened by CitySkills, which is the only national intermediary and support organization that facilitates the training and hiring of low-income adults from urban areas into Internet careers. These practitioners have come together to develop strategies that will advance Internet job training in urban communities. Collectively, DWA members have trained and placed over 500 low-income adults into web-development positions. (See Appendix A for more information on DWA members.)

Review of Existing Literature on IT Workforce Development

Last year, two major reports were issued on IT workforce development that are worth reviewing. The Information Technology Association of America (ITAA)^{viii} conducted a study, the largest of its kind, of 700 IT managers inside and outside the IT industry. Their findings and policy recommendations were summarized in *Bridging the Gap: Information Technology Skills for a New Millennium*. The ITAA report clearly illustrates just how robust and far reaching the IT sector is, as well as the types of jobs available and the skills needed to work in the sector. The other report, written by PolicyLink^{ix} for the Bay Area Video Coalition,^x provides the most comprehensive overview of the growing field of nonprofit IT job training programs to date. *From Promising Practices to Promising Futures: Job Training in Information Technology for Disadvantaged Adults* examined 26 of the most innovative nonprofit IT training programs nationwide that work with economically disadvantaged populations, dislocated workers, and disabled adults. The report offers best practices for developing and sustaining these programs and illustrates their important role in the workforce development sector.

These reports provide a useful glimpse into the world of IT workforce development and highlight several important factors facing the field. First of all, the term “IT” is itself complicated by the wide scope of its use. Another complicating factor is that “training” also has multiple meanings. In IT, training can include anything from an industry-sponsored certification program, like the Cisco Networking Academies, to a doctorate in computer science. This breadth means there are many different career paths that an individual can take within the sector. Perhaps more importantly for workforce development practitioners and their clients, this fact also suggests that there are multiple points of entry into the field.

To define positions available in the IT field, the ITAA report used the eight “IT career clusters” developed by the Northwest Center for Emerging Technologies^{xi} as benchmarks: programmer/software developer; database administrator/developer; web administrator; network design and integration; enterprise information systems integrator; digital media specialist; technology writer; and technical support. These clusters capture job titles, from entry level to senior management and illustrate the extent of opportunities available in the sector. (See Appendix B for a list of specific job titles included in each cluster.) The programs examined by *Promising Practices* also train people for jobs in these clusters.

Findings of the ITAA Study and Promising Practices Reports

Selected key findings of the ITAA study include:

- The IT workforce in the for-profit sector is estimated to be 10 million strong. That number would have been higher if the ITAA study included IT workers in small businesses, government agencies, and nonprofit organizations.

- The demand for qualified workers far outstrips the supply, with the greatest demand coming from smaller non-IT firms. For example, the ITAA report found that businesses with 50 to 99 employees need one million IT workers this year.
- Of all IT jobs available, technical support, network administration, and programming represent 68 percent of those in demand.
- Skills vary by job type, but there are a number of ways that workers can acquire skills, ranging from short courses and informal training to four-year colleges.

Selected key findings of *Promising Practices* include:

- Nonprofit IT training programs serve populations with different skill sets, backgrounds, and employment histories. Their services are in great demand from the communities that they serve.
- These programs have high placement rates for IT jobs in both IT and non-IT firms. Indicators of successful placement in IT jobs differ from those in other sectors.
- IT job training is a resource-intensive endeavor with a high rate of return on placement and higher quality of employment. The success of the program often depends on having skilled trainers on staff, technical support, and building the organization's technical expertise.
- Successful IT training programs are market-driven, entrepreneurial, and are developing innovative programs to serve their clients' needs.

A Sectoral Approach and Other Characteristics of Successful Programs

Towards A Sectoral Approach

A key point that the BVAC study makes, as do other researchers and practitioners in the workforce development field, is that embracing a sectoral approach is central to the success of IT

job training programs. The National Network of Sector Practitioners defines a sectoral approach as “long-term intensive employment and economic development strategies that target an industry, build new relationships with the key stakeholders in that industry, and improve the economic opportunities for low-income individuals, families, and communities in that industry.”^{xii} Jenny applauds this shift. “Finally, there’s an understanding that you have to talk to business,” she says. Due to the nature of the IT field, training programs must partner with the industry to teach their clients these skills because the requirements for IT jobs are so specific and companies’ business and employment needs change so quickly.

Michael Margolis, CitySkills’s Managing Director, believes that starting with the end goal – securing employment for participants – is the key to successful IT job training programs. One reason for employers to be engaged in the process from the beginning is to ensure that the curriculum being used matches the current industry standard.

Realizing the importance of industry/training program partnerships, CitySkills has made the effort to work with both community-based job training programs and Internet employers since its inception. “Technology is changing the way that every business in every industry in every country does business,” states Margolis.

IT training programs have emerged where there are high-tech clusters.^{xiii} For example, *Promising Practices* looked at training programs in New York, San Francisco/Silicon Alley, Austin, Boston, Seattle, and Washington, DC, all areas of the country that are considered high-tech corridors.

Other Key Characteristics of Successful IT Workforce Programs

Successful programs also share the following characteristics:

- Curriculum and Skills Training: The nature of IT work also affects how programs teach their clients in soft skills and basic education. An effective curriculum “gives people a sense of context and environment,” says Margolis. These skills have to be placed in a context that is relevant, and will remain so, upon leaving the program and securing employment. For example, hard technology skills must be taught in a project-based setting, since many technology companies work in project teams.

This is a shift for many, if not most, training programs. Under the Job Training and Partnership Act (JTPA),^{xiv} training programs focused on improving workers’ basic skills, such as writing and math, believing a solid educational foundation would help a person secure employment. During the last ten years of JTPA, training programs shifted their efforts to a “work first” model, focusing on employment-related services such as resume writing and “soft” skills (basic office operations and professional etiquette).^{xv} Now, in addition to basic educational and office skills, clients have to learn project management, effective communication skills, and how to work in teams. Additionally, the setting in which the training occurs has also changed – for example, CitySkills advises programs to create a competitive, businesslike process starting from the first time prospective participants are interviewed through placement.

The nature of IT work requires that, in addition to support provided to program participants, ongoing training and skill building are necessary to remain employed over time. Industry standards change as quickly as technology does and keeping current is critical to remaining employed, as well as building a skill set that allows one to become upwardly mobile.

- A Technology Culture: This is a larger point about the integration and adaptation of technology in the nonprofit sector, but it applies to IT job training programs as well. Many nonprofits involved in job training remain on the wrong side of this “organizational divide.”^{xvi} This gap directly impacts the quality of technology-training programs. The way that programs think about teaching clients technology skills is limited by their own knowledge base and understanding of the topic. Good communication is also key to sound technology training – staff members need to be able to talk about technology in a way that is not jargon laden. While there are many notable efforts nationwide that address nonprofits’ use of technology, for organizations operating IT job-programs these factors must still be overcome in order to operate a successful program.
- Entrepreneurship and Leadership:^{xvii} Margolis thinks that IT job training programs have an entrepreneurial culture, as well as strong leadership that are willing to innovate. These are characteristics they share with IT companies. “Just as the ways of doing business have fundamentally changed in the New Economy, community organizations with a desire to deliver Internet job training must similarly retool and adapt to new approaches of organizational management, program delivery, and performance,” he said.

Promising Practices also identifies flexibility and innovation as important qualities of successful IT job training programs. This flexibility allows programs to meet both the needs of their clients and of employers, as well as to adapt curricula and training to meet local labor market needs.

Opportunities for Philanthropy

“This field needs to be approached on a systemic basis,” says Jenny from the New York Community Trust. While she acknowledges that many funders are focused on programs,

“foundations also love new ideas.” Many opportunities exist for philanthropy to be of strategic assistance to this growing field, including:

- Partnerships: Partnerships with other community-based organizations are critically important for IT job training programs. Foundations can help facilitate strategic partnerships between community-based or traditional job training organizations and IT job training programs, which could take advantage of these organizations’ distinctive competencies in service delivery to low-income populations. Partnerships capitalizing on respective core capacities could help all parties serve their clients more efficiently, as well as provide their clients with greater opportunities.

Strengthening existing partnerships with educational institutions, as well as creating new ones, is also important. Many program participants still need to acquire basic educational skills and educational institutions like community colleges are well equipped to provide basic educational services. These partnerships could provide participants with both skills and credentials employers find attractive.

- Information Gathering: Establishing performance measurements specific to the IT job training field will help training programs track clients’ progress and ensure that employers needs are met. While the IT job training field is young, the importance of evaluation and tracking has been relevant. Anecdotal and straightforward data around placement and wages are extremely promising. Philanthropists can help establish these metrics by gathering organizations who have a track record of developing good benchmarks and having them play a role in this field.
- Building Programs and Capacity: IT job training programs are operating at full capacity and dealing with explosive growth as they look to meet the demand from both clients and employers. They are facing the same challenges as any new organization: securing funding,

managing growth, and the dual evolution of organizational infrastructure and programs. Strategic funding can help IT job training programs attract and retain qualified staff,^{xviii} grow to scale, establish the field's infrastructure, seed programs, and ultimately, help organizations deliver high quality services and fulfill their missions.

Currently, IT job training programs receive funding from a variety of sources, including foundations, government contracts, corporations, and individuals. Characteristic of the entrepreneurship exhibited by IT job training programs, funding streams should be flexible and allow the programs to innovate and change as necessary. Jenny noted that the large programs training thousands of individuals a year that are funded primarily by government contracts are not going to have the flexibility to engage in IT job training. Recognizing this, foundations should provide funding for programs looking to innovate in order to meet the ever-changing needs of the IT workforce.

Conclusion

There is a lot of enthusiasm and excitement around IT job training programs for low-income adults – and with good reason. IT job training programs are giving individuals the skills necessary – technical skills as well as project management and team building – to succeed in the dynamic new economy. This training can provide individuals access to career ladder, well-paying jobs in the mainstream economy and a gateway to lifelong learning and professional opportunity. For their part, foundations and other philanthropists can play a critical role in supporting nonprofit organizations that provide low-income populations with opportunities in the high-tech field.

Resources

Articles

Foster-Bey, J., Rawlings, L., & Turner, M., *Has the Rise of Digital Economy Reduced Employment Opportunities for Less Educated Adults?* (San Francisco, CA: PolicyLink and Bay Area Video Coalition, 2000).

Chappel, K., Zook, M., Kunamneni, R., Saxenian, A., Weber, S., & Crawford, B., *From Promising Practices to Promising Futures: Job Training in Information Technology for Disadvantaged Adults* (San Francisco, CA: Bay Area Video Coalition, 2000).

Gruber, D., *We're Education... You're Semiconductors* (Philadelphia, PA: Public/Private Ventures, 2000).

Information Technology Association of America (ITAA), *Bridging the Gap: Information Technology Skills for a New Millennium* (Arlington, VA: ITAA, 2000).

John J. Heldrich Center for Workforce Development at Rutgers University, and Center for Survey Research and Analysis at the University of Connecticut, *Nothing But Net: American Workers and the Information Economy* (Newark, NJ: Rutgers University, 2000).

Lerman, R., Riegg, S., & Salzman, H., *The Role of Community Colleges in Expanding the Supply of Information Technology Workers* (Washington, DC: Urban Institute, 2000).

Meares, C., Sargent, Jr., J., *The Digital Workforce: Building Infotech Skills at the Speed of Innovation* (Washington, DC: USDOC, 1999).

Stoll, M., *Workforce Development Policy and the New Economy: Challenges, Tensions, and Opportunities in Connecting Low-Skilled Workers to IT Jobs* (San Francisco, CA: PolicyLink and Bay Area Video Coalition, 2000).

21st Century Workforce Commission, *A Nation of Opportunity: Building America's 21st Century Workforce* (Washington, DC: 21st Century Workforce Commission, 2000).

United States Department of Commerce, Office of Technology Policy, *America's New Deficit: The Shortage of Information Technology Workers* (Washington, DC: USDOC, 1997).

United States Department of Commerce, Office of Policy Development, *Digital Economy 2000* (Washington, DC: USDOC, 2000).

Interviews

Patricia Jenny, Program Director, New York Community Trust, December 14, 2000

Michael Margolis, Managing Director, CitySkills, December 12, 2000

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Endnotes

ⁱ United States Department of Commerce, *Digital Economy 2000*, page 43.

ⁱⁱ Information Technology Association of America, *Bridging the Gap: Information Technology Skills for a New Millennium*, April 2000, page 5.

ⁱⁱⁱ Much attention has been paid to the technology industry's lobbying of Congress to increase the number of H1B visas, which allow specially trained workers to enter the country for up to five years. There is great debate about H1B visas, with some opponents questioning how real the shortage of technology workers really is. Given the amount written on H1B visas by the media and the polarizing nature of the debate, this paper will not explore the H1B issue. More information can be found at <http://www.ins.usdoj.gov/graphics/howdoi/h1b.html>.

^{iv} For more information on community colleges and information technology workforce development, see *The Role of Community Colleges in Expanding the Supply of Information Technology Workers* by Robert I. Lerman, et al. (Washington, DC: Urban Institute, 2000) and *We're Education...You're Semiconductors* by David Gruber (Philadelphia, PA: Public/Private Ventures, 2000).

^v Partners include Glide Church, Mission Community College, San Francisco City College, and Manpower, the for-profit employment service.

^{vi} United States Department of Commerce, *Digital Economy 2000*, page 45.

^{vii} The author has limited its scope to job training programs for low-income adults in urban areas (aged 18 and over), since youth workforce development is a separate field. Additionally, the paper has been limited to programs that train adults in web design and development and network administration. Specifically, it does not deal with computer repair training programs, although some of its findings can be applied to the broader information technology-training field. Several nonprofits have been quite successful with training low-income adults for careers in computer repair; an example of a model computer repair-training program is Per Scholas in Bronx, NY (www.perscholas.org).

^{viii} The ITAA is the leading trade association for the information technology industry, whose constituency includes computer hardware, software, Internet, systems integration, application service providers, e-tailing, portals, IT services, and communications companies. For more information, visit www.ita.org.

^{ix} PolicyLink (www.policylink.org) is "a national policy, research, communications, and capacity building organization advancing a new generation of policies to achieve social and economic equity and build strong organized communities."

^x The Bay Area Video Coalition (www.bavc.org) is a video and new media nonprofit arts center in San Francisco that provides technology, training, and support to nonprofits and artists.

^{xi} The NorthWest Center for Emerging Technologies (www.nwct.org) works with businesses, government, and education to develop skill standards, curricula and other certification and assessment processes for workforce development in the new economy.

^{xii} For more information on sectoral strategies, visit The National Network of Sector Practitioners home page at www.nedlc.org/nnsf.

^{xiii} For more information on Internet clusters, see Joint Venture's "Internet Cluster Analysis 2000" at www.jointventure.org.

^{xiv} In 1998, the Workforce Investment Act (WIA) replaced JTPA as the federal workforce development strategy. For more information on WIA, visit www.usworkforce.org.

^{xv} Michael A. Stoll, *Workforce Development Policy and the New Economy: Challenges, Tensions and Opportunities in Connecting Low-Skill Workers to IT Jobs*, PolicyLink and Bay Area Video Coalition, October 2000, page 6.

^{xvi} "Organizational divide" is analogous to "digital divide," with the difference being it refers to nonprofits lagging behind the private sector in technology adaptation.

^{xvii} It should be noted that while dynamic leadership is a plus in this sector, the "burnout" factor is just as relevant to IT job training programs as it is the rest of the nonprofit sector. Institutionalization of this entrepreneurial culture is important.

There are many fine examples of innovative, entrepreneurial leaders at IT job training programs. Homeboyz Interactive in Milwaukee, WI, founded by Brother Jim Holub, S.J. in 1996, is a good example of what this looks like at the grassroots level. www.homeboyz.com

^{xviii} *Promising Practices* notes that nonprofit IT job training programs have a difficult time paying IT staff the salaries they can command in the for-profit sector, and this is an obstacle to recruiting and retaining staff.

**Appendix A: Digital
Workforce Alliance
Members**

- **Bay Area Video Coalition's MediaLink, San Francisco, CA:** Over 200 participants have graduated since 1997. 95% placement rate.
- **Byte Back, Washington, DC:** Placed six-individuals into full-time employment.
- **Catalyst Associates, Baltimore, MD**
- **Homeboyz Interactive, Milwaukee, WI:** 130 participants trained since 1996. Average starting salary is \$40,000.
- **ICStars, Chicago, IL**
- **Op Net in San Francisco, CA:** 172 participants have been trained since 8/97. 50% have acquired full-time employment in the industry after completing their internship. Average starting salary range: \$30,000 - \$45,000.
- **Playing2Win, New York, NY:** Placed 10 individuals into full-time employment.

Data taken from organizational webpages and www.cityskills.org

Appendix B: Specific Job Titles included

in NWCET IT Career Clusters

- **Database Development and Administration:** Data Administrator, Data Analyst, Database Manager, Systems Analyst
- **Digital Media:** Animator, Media/Instructional Designer, Multimedia Developer, Web Designer
- **Enterprise Systems: Analysis and Integration:** Application Integrator, Cross-Enterprise Integrator, Data Systems Designer, Information Systems Architect.
- **Network Design and Integration:** Information Systems Administrator, Network Administrator, PC Support Specialist, User Support Specialist
- **Programming/Software Developer:** Applications Analyst, Data Modeler, Programmer, Software Tester
- **Technical Support:** Call Center Support Representative, Customer Liaison, Help Desk Technician, Product Support Engineer
- **Technical Writing:** Desktop Publisher, Editor, Electronic Publisher, Technical Writer
- **Web Development and Administration:** Web Administrator, Web Architect, Web Designer, Webmaster

From *Bridging the Gap: Information Technology Skills for a New Millennium*, ITAA 2000.

Information also available at www.nwcet.org