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Information, Tools, and Technology

Informing Labor Exchange Participants

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LABOR EXCHANGE—CASTING THE 'NET

Fueled by the opening of the Internet to public use, the last eight years have witnessed revolutionary changes in the availability of information on the labor market and in labor exchange services provided by both the private and the public sector. Most obvious has been the explosive growth in proprietary and public job search sites on the Web, providing unparalleled access to job openings information through thousands of job search sites. The most visible examples in the public labor exchange and workforce development system are America's Job Bank and state job banks, but there have been many other public sector investments as well. Technology and the Web have stimulated new methods and processes for bringing together employers and workers. Never before have employers, job seekers, students, counselors, educators, and others had such access to a vast array of job openings, services, higher quality labor market information, and assessment tools.

The U.S. Department of Labor (USDOL) has taken major strides to improve labor market information (LMI), much of it through work of the Bureau of Labor Statistics, state workforce agency LMI divisions, and the Employment and Training Administration (ETA). Investments have been made to automate processes to support workforce development including Unemployment Insurance (UI) systems and one-stop operating systems to organize and track services to customers. The

USDOL also undertook major work to replace the Dictionary of Occupational Titles with the new Occupational Information Network (O*NET) system, which provides a common language of occupational characteristics that better reflects the contemporary workplace. Most importantly, nearly all of the data and information developed through USDOL investments are accessible not only to customers through state and federal Internet sites and other products, but also to other public and private application developers who are building customized products for different customer groups.

The Workforce Investment Act of 1998 (WIA) and its emphasis on providing universal services has stimulated the public workforce development system to develop new ways to serve a wider range of users. The WIA established a national policy that recognizes providing information to the public is one of the primary rather than ancillary functions of the public workforce investment system. As a result of the USDOL investments in information and the potential offered by the Internet, nearly every citizen has reasonably easy access to information that can support their participation in the labor market.

In this chapter, we explore the significance of technology, particularly automation and the Internet, on the labor exchange process and services. Much of this discussion will focus on public sector use of technology to improve labor exchange services. However, we also consider the larger context of private and public operators that have exploited technology and the Internet to provide labor exchange and labor market information services. To a great extent, we argue that advances in labor exchange are due to the greater availability of more extensive and higher quality information and services that provide for the flow, exchange, and interpretation of the information to smooth the operations of the labor market. Another important theme of this chapter is the power of the Internet to provide interconnectivity between Web-based services. This interconnectivity is due in no small part to information standards followed by USDOL and the states in developing and providing labor market and job openings information. To fully appreciate such seamless access to information, the reader is encouraged to try out selected Web resources referenced throughout the text and notes.

While the explosive growth of labor market and job search information on the Internet provides greater potential than ever to smooth the labor exchange and job match connections, it is not a panacea. We must avoid the temptation to rely overmuch on electronic self-service

tools, to assume that these will meet the needs of every employer and person. A balanced approach of electronic self-service and staff-supported services is key to meeting the diverse needs of a wide range of customers (Balducchi and Pasternak 2000). The WIA paradigm of universal service creates a significant challenge to the public workforce development sector: how to serve a much larger audience, theoretically all citizens and employers, while at the same time ensuring that more intensive services are provided to those who need it the most. Automation, technology, and the Internet have provided some of the tools without which the public one-stop delivery system could not begin to meet the needs of this larger audience. Many of the new resources provide the tools for front-office staff in one-stop career centers and other workforce development settings to better serve more customers. It is only with adequate resources to collect, compile, and analyze information, as well as quality staff who are trained and equipped to understand and use the power of information on the marketplace that the public workforce investment system can successfully meet its mission.

There are many factors that have changed the face of labor exchange. Among them are those listed below:

- The profusion of job search sites on the Internet, both public and privately developed and operated.
- The expansion of a nationwide labor market information system with even higher quality and more extensive labor market information.
- The development of a common occupational language and structure through the Standard Occupational Classification (SOC) and O*NET systems, which has significant implications for interconnectivity of information to meet customer needs.
- The migration of career information delivery systems (CIDS), state supported labor market information delivery systems, and a host of private sector products and services to the Web, as well as national products and systems such as the suite of tools available through the CareerOneStop portal (formerly known as America's Career Kit), O*NET OnLine, the Occupational Outlook Handbook, and others.
- Automation of many of the UI benefit and tax systems and development of statistical profiling models associated with state Worker Profiling and Reemployment Services systems in the states.

- The development of new processes to serve customers in one-stop career centers, including customized information systems such as the One-Stop Operating System, decision support systems, and other means to more effectively serve customers who are preparing for the labor market or seeking employment.
- Transactional data analysis to identify changing marketplace needs.
- And most significantly, the interconnectivity among many different Internet sites to provide easy access to employers and job seekers to information about the labor market to support labor exchange activities.

The full impact of the improved exchange of information in the economy remains to be seen, particularly in regard to how it might improve the connections between employers and workers and what problems might arise. Any judgments made today might well be tempered by the observation and advice offered by Joseph A. Schumpeter in *Capitalism, Socialism and Democracy*,¹ “since we are dealing with a process whose every element takes considerable time in revealing its true features and ultimate effects at a given point of time; we must judge its performance over time, as it unfolds . . . we are dealing with an organic process, analysis of what happens in any particular part of it . . . may indeed clarify details of the mechanism but is inconclusive beyond that” (Schumpeter 1950).

Some consideration of both public and private sector resources, tools, and services are covered in this overview, although much of the detail will focus on the public sector, particularly as related to USDOL efforts. America’s Job Bank (AJB) will be explored in more detail than other resources because it is among the most visible of USDOL investments, and because a recent study of AJB affords a detailed view of the dynamics of Internet-based job search services. There also are tensions between private and public operators in providing information and labor exchange services because the Internet has expanded the capability of both sectors to deliver information directly to the consumer. In spite of, or perhaps because of, concerns with the appropriate roles for the government and private parties, new opportunities have developed for direct or indirect private and public collaboration in both the development and delivery of information, and this issue will be considered as well.

LABOR EXCHANGE: A LIFELONG VIEW

We borrow from Schumpeter's notion of the economy as an organic process and explore the impacts of automation and information on labor exchange in a much broader context than just the point at which job seekers and employers are matched. Labor exchange is a lifelong, dynamic process for individuals and employers. For convenience of discussion it is useful to consider labor exchange in two contexts: first, from the perspective of the "job market"² in which the focus is on the more immediate job search and hiring process—this is the traditional concept of labor exchange; and secondly, within the broader view of a dynamic labor market that encompasses short- and long-term flows and evolution of employer skill requirements, job opportunities, and labor supply.

Viewed in this light, the labor exchange process includes features such as

- the employer/job seeker match—the job market hiring process;
- career planning, guidance, and preparation—preparing for the workplace needs;
- economic development and employer planning, which has a profound effect on labor exchange in terms of skill requirements, the location of needed supply, and preparation of the workforce to meet occupational needs; and
- educational preparation and curriculum development—ultimately for the employer/job seeker to make a successful match, the marketplace must offer the necessary training and education for individuals (and employers) to meet the production needs of the business community.

If job seekers come to the marketplace without the requisite skills demanded by the business community, then inefficiencies in the employer/job seeker match will raise the costs to employers, the job seeker, and the community at large. Similarly, if workers do not keep up-to-date and prepare for changing skill needs, the potential mismatches between business needs and job seekers' skills will likely grow, leading to longer spells of unemployment and decreases in product and service output with resulting costs to the job seeker, employer, economy, and

taxpayer. A study by the Office of Technology Assessment in 1990 (U.S. Congress 1990) noted, “churning in the economy far exceeds new job creation as a driving force for training . . . This is true even for rapidly growing industries and occupations.” Such churning is to be expected to a degree in the market, but providing information to current workers and the future worker pool, youth and those out of the labor force, to help them better plan and prepare for careers and skill requirements in the workplace, may help reduce some of the churning as well as reducing the time that it takes for an employer and job seeker to make a match.

Whether viewed from the short-term job market perspective or longer-term career preparation context, what is common to all of these features of an organic labor exchange process is the need for shared information: signals from the marketplace on the changing skill needs, listings of job openings, job seekers sharing their background through resumes, information on occupational projections. Information “sharing” is perhaps the most essential component of a successful set of labor exchange services.

INFORMATION: THE FOUNDATION OF LABOR EXCHANGE

A fundamental feature of a free market economy is open access to information about the marketplace in all of its detail. Indeed, economic theory assumes the availability and exchange of “perfect” information. Information is the lifeblood of the economy (Lawrence 1991); without it the free market, or any economic system, would wither and collapse. There would be few understandable signals to producers and purchasers of goods and services. Perfect information and complete access to it as envisioned by theory is, of course, not possible in the complex interactions of the consumer and labor markets. As Autor (2001) writes, “The labor market is replete with imperfect and asymmetric information.” However, the very fact that the marketplace can never produce perfect information emphasizes the importance of discussion and consideration of the ways that technology, automation, and new processes have improved—and may further improve—the labor exchange process.

The Internet has opened the door to a vastly expanded flow of information and to new organizations to deliver information. It has significant implications for improving not only the access to information, but the range, quality, and interconnectivity of information that is available to the job seeker, student, counselor, and employer. The remainder of this chapter examines the significance of information and the impact of technology in improving the quality and timeliness of information, as well as the systems that deliver it on the operation of the labor market.

THE JOB MATCH—CONNECTING JOB SEEKERS AND EMPLOYERS

Undoubtedly the most dramatic and visible change in labor exchange services has been the birth and then explosive growth of job search sites on the Internet. Workers have and will continue to use many methods to find jobs including personal contacts (networking), job postings within a business establishment, family, newspaper want ads, professional association postings, unions, and public one-stop career centers. The Internet does not necessarily replace such sources but vastly expands access to job openings for individuals and access to prospective workers for employers. Prior to 1994–1995, when the first Internet job search sites began to appear on the Web, with AJB being one of the first, it was difficult if not impossible for people to search easily for job opportunities across the country or outside their local area.

Today, only eight years later, in the matter of a few minutes a person can search for job listings throughout the nation using several different Web job search services. Employers can search databases of thousands of resumes that have been posted by individuals to select prospective workers. On-line job search sites provide better, more flexible, and easier search capabilities than other job search resources. For example, in less than five minutes on a 56K modem connection, national job searches of three job sites selected ad hoc were made. The results of these searches are shown in Table 6.1. The table is not intended to compare the three sites but rather to illustrate that almost instantly we have access to information on thousands of job openings. While not shown here, in a few additional minutes, the same searches were car-

ried out for Maryland, California, and four selected local areas. Simply put, the Web has opened the door to greater access by job seekers to employer needs, information that can be used along with other sources in the job search.

While there is little concrete information available on the impact or success of job search sites on the Web, it is clear that job search on the Web is here to stay and will likely continue to increase. However, it is critical that consumers treat the Internet as only one source in their job searches. Margaret F. Dikel writes, “The Internet is merely an added dimension to the traditional job search, and it is not an easy dimension to add. Job hunters need to focus less on the search for job listings and more on the idea of using the information accessible on the Internet as a tool for researching organizations and finding possibilities” (Dikel 2001). Similarly, Richard Bowles suggests that the Internet supports labor exchange in a broader context, that it provides a resource for job listings; posting resumes; finding career counseling or job search assistance; as a means for researching occupations, businesses, and geographical areas; and as a place to make contacts to help you find information (Bowles 2001).

A variety of sources of job information and resume services are available through the Web, including the following types:

- General job search sites covering a wide range of occupations. Examples include sites such as America’s Job Bank, Monster.com, CareerBuilder.com, and Hotjobs.com.
- Specialty sites: focusing on a narrower range of jobs such as information technology. An example in the technology arena is Dice.com
- Mega search–engine sites—these sites search several available job bank sites at the same time.

Table 6.1 Example of a National Job Search on Three All-Purpose Job Search Sites

	America’s Job Bank	Monster.com	CareerBuilder.com
Welder	1,568	92	107
Programmer	4,356	2,531	3,241
Secretary	4,007	1,975	1,373

- Portal search sites that provide links to job search sites, but may or may not include their own job search engines.
- Trade, professional association, and union sites.
- Corporate/employer-based sites—thousands of employers advertise their openings on the Web.
- Newspaper help-wanted ads available on the Internet—hundreds of newspapers are available on the Web, and most include their help-wanted ads.

In general, the more developed job search Web sites provide a variety of capabilities to employers and job seekers that potentially facilitate the job search and hiring process:

- Employers can post job openings information on the site. Some sites may provide a variety of tools to assist employers. For example, AJB allows employers to enter job openings directly into the system or batch load multiple job openings at the same time. Depending on the site, employers may enter a range of information, such as the job description, task statement, skill requirements, educational requirements, experience requirements, wages/benefits, and other pertinent information. A cursory review of Web sites reveals that the Web contains more robust job information than typical help-wanted ads in a newspaper.
- Many sites let users post their resumes on the Web, allowing job seekers to include details about their education and work background, as well as other relevant information.
- Job seekers can search for job openings throughout the nation or throughout entire databases of jobs included on a specific Web site. Most sites provide simple-to-use search capabilities, including keyword, job title, and/or searching by precategorized occupational families. Many sites add optional advanced search capabilities, including parameters such as desired wage level, geographical location, and educational requirements.
- Employers can search resumes that have been posted on the site, again using different methods that typically include keywords, occupational titles, and other criteria.
- Over the last two years, many of the job search resources have added automated features and tools to search the site actively by introducing job/resume “scouts” or “agents.” For example, a job

seeker can store criteria to be used for different searches and have the system carry out the searches and provide the results the next time the job seeker logs on. Similarly, some sites allow employers to request the system to search for resumes that are active and meet their specified criteria. Some sites may e-mail notices to employers or job seekers with results of “agent” searches.

CAREERONESTOP: INFORMATION EXCHANGE ON THE INTERNET

The public labor exchange system has exploited technology to attempt to improve labor exchange services for the last 25 years. While perhaps not recognizable today as “high tech,” efforts were made to begin sharing selected job openings from state employment security (ES) agencies across states in the 1970s through the Employment Security Automated Reporting System (ESARS). Data were processed on mainframe computers and microfiche with job openings provided back to the states. In 1979, USDOL established a national job openings database, dubbed the Interstate Job Bank (IJB), in which jobs were shared among states via microfiche. By November of 1993, there were only 48,000 jobs on the IJB (Balducchi and Pasternak 2000).

These early efforts provided experience and a foundation that positioned USDOL and the states to take advantage of the unanticipated opportunity offered by the Internet. With the Internet opening up to the public in the early 1990s USDOL and state ES agencies working in partnership were among the first to take advantage of the Internet as a medium for labor exchange by Web-enabling AJB in February of 1995. AJB began as a means of electronically sharing job openings from ES offices, a direct descendent of the IJB, but work soon began to expand AJB to include resume services, direct posting of jobs on AJB by employers, and batch uploading of jobs by employers. On August 13, 2002, AJB had over 900,000 active job openings and over 400,000 resumes posted, making it one of the largest job search services on the Web.

With AJB as its core (known originally as America’s Career Kit), USDOL undertook a key strategy to develop a larger suite of labor ex-

change and career planning and preparation services on the Internet. These services have recently been revamped as the CareerOneStop portal. This suite of services takes advantage of the interconnectivity power of the Internet and was designed to provide a seamless source of information on occupations including job openings, occupational projections, wage estimates, industry information, career planning resources, information about states, as well as information on support services. The implementation of this suite recognizes the importance of viewing labor exchange as a much broader activity than just job placement, though the ultimate goal is the successful match between employers and job seekers. The components of this set of Internet sites are described in Table 6.2.

In addition to the CareerOneStop products, there are several other USDOL-sponsored national sources of LMI and occupational information. Most notably, the Bureau of Labor Statistics (BLS) provides a vast amount and range of information for the nation, states, and even local areas at the BLS Web site, <http://stats.bls.gov>, including data on unemployment, occupation and industry estimates and projections, wage information, labor force participation, the *Occupational Outlook Handbook*, the *Career Guide to Industries*, and the *Monthly Labor Review*. Another key resource provided by the ETA is O*NET OnLine <http://online.onetcenter.org/>, which provides direct access to the O*NET information.

AMERICA'S JOB BANK: A CASE STUDY IN PUBLIC AUTOMATED LABOR EXCHANGE

As noted earlier, there is little information available on employer or job seeker outcomes using Internet job openings services. Any outcome information for most of the job search sites is generally proprietary in nature and would not be available for any broad-based study of job search site outcomes. While it is easy to track the usage of a site, it is more difficult to determine whether an employer actually makes a hire or a job seeker finds a job using a particular service. However, there is a notable exception, thanks to AJB. In 2001, USDOL commissioned an outcomes study on AJB, which provides useful insight into the dynam-

Table 6.2 CareerOneStop Web Sites

- **America’s Job Bank (AJB) [www.ajb.org]**. This is one of the most used job service sites on the Web. The AJB site advertises, “America’s Job Bank is the biggest and busiest job market in cyberspace. Job seekers can post their resume where thousands of employers search every day, search for job openings automatically, and find their dream job fast. Employers can post job listings in the nation’s largest online labor exchange, create customized job orders, and search resumes automatically to find the right people fast.” With over 900,000 job postings and 400,000 resumes in mid August 2002, AJB provides a foundation for USDOL investment in automated services to support job seekers and employers directly in the labor exchange process.
- **America’s Career InfoNet (ACINet) [www.acinet.org]**. This site is designed to help individuals make better, more informed career decisions. It provides invaluable information for employers, job seekers, human resource specialists, counselors, students, and workforce investment specialists in one-stop career centers and other settings. The Web site helps customers do the following:
 - Obtain information on wage and employment trends for occupations and across industries. Selected information is presented at the state and major metropolitan level with comparisons to national trends. State employment security agency LMI divisions (funded by the Bureau of Labor Statistics and the Employment and Training Administration) develop most of this information.
 - Learn about the education, knowledge, skills, and ability requirements for occupations. Much of this information is from the O*NET system.
 - Search for employer contact information nationwide—a powerful feature of the system that allows any user to directly search employer files or identify employers through occupational and industry searches.
 - Use over 5,000 external links to the most extensive set of career resources on the Internet.

- **America's Service Locator (ASL) [www.servicelocator.org]**. This service is offered both through the Web and via a toll-free hot line [www.servicelocator.org and 1-877-US-2JOBS]. It provides a comprehensive source of information on service providers and services available in local areas including job training, unemployment insurance benefits, education opportunities, seminars, special services for the disabled or older workers, and much more. The site is possible as a result of a partnership among USDOL, state governments, and local agencies that support this nationwide database. This information directly supports public sector efforts to provide re-employment services support to displaced workers and also supports the public at large. By automating this information and making it easier for individuals to access in a self-service mode, it saves staff time and reduces costs and increases productivity, allowing staff in one-stop career centers and other service providers to focus their efforts on direct services.
 - **Workforce Tools of the Trade [<http://www.workforcetools.org/>]**. This service is intended to support the professional growth of workforce development personnel at all levels. The site provides easy access to a large database of training resources, providers, and institutes for human resource development professionals. It also provides features that support collaboration and communication among workforce development personnel.
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ics of Internet job search for both employers and job seekers. The unpublished findings from this study, conducted by TATC Consulting (2001), are summarized below and should be reviewed with three caveats in mind:

- 1) The findings do not provide a definitive evaluation of AJB, rather, they represent an initial investigation into the degree to which employers use and hire applicants from AJB, and similarly the extent to which job seekers find jobs using AJB.
- 2) The results of the study do not represent all job service sites on the Web, but may at least be suggestive of some aspects of Internet labor exchange job listing services.
- 3) Internet job search is simply one more means for employers and job seekers to find each other, and the results of the initial AJB study must be viewed in this context.

With these parameters in mind, however, the study does provide the first real glimpse into some of the dynamics associated with Internet-based job search and may be instructive not only for the initial findings, but as a guide for further research and examination as well.

The AJB Outcomes Study, conducted between April 2001 and February 2002, used a short-term longitudinal study to track AJB users (employers and job seekers) posting new jobs and resumes over a three-month period. Both employers and job seekers were interviewed every two weeks on the relevant study questions. The study results are based on 251 employer participants and 264 job seekers. Participants in the study were “recruited” from a sample of AJB customers who had recently posted a job or resume, so there is a degree of self-selection. As such, some of the characteristics of the customers may not be representative of all employers or job seekers using AJB, but we believe this is a minor limitation relative to the insight provided by this study.

During the study period, national unemployment rose from 4.5 percent to 5.5 percent (peaking at 5.8 percent in December 2001). While it is impossible to determine the full impact of this economic downturn on hires, it is conceivable that the percentage of hires may have been less during the study period than in prior years of AJB operation. This provides further context in which to view the findings.

Of the employers participating for the full three months, about one-third represented the staffing industry (31 percent), information tech-

nology (14 percent), manufacturing (14 percent), finance/insurance (7 percent), and retail/wholesale trade (7 percent). Job seekers, by type of job sought, included information technology (19 percent), sales/marketing (8 percent), clerical (5 percent), manufacturing (4 percent), project management (3 percent), administration (3 percent), and management (3 percent). The key findings of the study are listed in Table 6.3, followed by our analysis of the findings.

The study results provide several interesting insights on the use of AJB. A key question is whether AJB appears to be an effective method for making such connections among many methods. In our view, the AJB study provides initial evidence that AJB is an effective resource for several reasons.

First, it appears that employer postings on AJB successfully attract job seekers, with over 80 percent of the employers receiving at least 1 resume; on average, those receiving resumes received nearly 21 resumes. Also, almost 50 percent of the postings of these employers received at least 1 resume. From these results, AJB appears to be a very successful resource to make an initial set of contacts between employers and job seekers.

Secondly, with employers interviewing 665 individuals (about 13 percent of the resumes received), AJB was effective in providing enough quality resumes to interest employers in the second stage of the job match process. This averages out to about three interviews per employer receiving resumes.

The important third stage, hiring, requires a little more analysis. Eight percent of the job orders led to at least one hire compared to 19 percent of job orders filed through non-AJB sources. Because job orders/postings may actually include more than one job opening, it is important to highlight that 4 percent of all openings were successfully filled, compared to 10 percent through all other sources. On the surface, this may raise a question on the relative success of AJB. But on further view, note that this comparison is between AJB and all other sources, including private job banks, other public employment services, help-wanted ads, and private employment agencies. The ratio of resumes received from all other sources to AJB-generated resumes was approximately 3.4 to 1, while the ratio of hires by job orders from all other sources to AJB was 2.4 to 1. This indicates that for the study group of employers, AJB was actually relatively successful in leading to hires.

Table 6.3 AJB Study: Employer and Job Seeker Outcomes

Employer outcomes (251 employers)

- 83% of employers received at least one resume in response to their job postings and 46% of postings by those employers received at least one resume.
- 5,088 total resumes were received in response to AJB postings; employers reported receiving 17,180 resumes from all other sources combined (e.g., other job sites, newspaper ads, etc.).
- Employers who received resumes from AJB received an average of 20.8 resumes.
- 665 job interviews resulted from AJB use by employers in the study.
- Approximately 50% of the employers using AJB conducted at least one interview.
- Employers conducting interviews conducted an average of 4.5 interviews.
- 8% of all job postings in AJB led directly to at least one hire (+/- 3%; - 95% confidence interval) [Note—19% of job orders were filled through all non-AJB sources combined.]
- 4% of all job openings were successfully filled (Note—postings may include multiple job openings, thus the small percentage), (+/-2%) [Note: 10% of all openings posted were successfully filled through all non-AJB sources combined.]
- 35% of the employer sample hired at least one person through AJB.
 - 30% hired at least one person based on job postings.
 - 11% filled jobs using the resume search (5% used only the resume search to make a hire while 6% also hired through resume search and job posting).
- 45% of the employers making a hire through AJB hired more than one person through AJB during the three-month study period.
- A total of 222 hires were made using AJB by employers in the sample during the three months they were in the study.

Job seeker outcomes (264 job seekers)

- 10% (26/264) of participants found jobs directly through AJB. Because of the small sample, this reflects only 26 people. Of those finding a job through AJB:
 - 46% were employed, 46% were unemployed, and 8% did not specify employment status.
 - 38% had some college, 31% were college graduates, and 12% were high school graduates.
 - 28% (72/246) found jobs through all other sources.
 - 62% (164/246) found no job during the course of the study.
 - Characteristics of the job seekers participating in the study (while not an outcome, the characteristics are important in reviewing the above outcomes):
 - 65% were unemployed, 28% were employed, and 10% did not specify.
 - All levels of education were represented, but some college (28%) or college graduate (29%) were the most common levels, followed by graduate degree (17%) and high school graduate (9%).
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SOURCE: AJB Outcomes Study, April 2001–February 2002.

The study clearly confirms that employers who use AJB also use other resources to recruit prospective employees, and that AJB is an additional resource to facilitate labor exchange.

Finally, the study confirms that employers who register with AJB use the services, with 97 percent of the employers posting at least one order and 76 percent searching resumes at least once during the study period.

From the job seeker perspective, the size of the sample limits our analysis because for each individual, we are studying success in a single job seeker/employer match. However, based on the study findings, AJB appears reasonably successful, with 10 percent of job seekers obtaining a job compared to 28 percent through all other sources (which includes networking, family connections, and other listing services and employment agency support). There is not sufficient information to analyze all of the results in detail, including the observation that 62 percent (164) did not find a job during the study period (a period in which national unemployment increased). This would appear to be a promising area for future research to shed more light on the dynamics of AJB use.

The AJB study goes on to extrapolate the study findings for the July 1, 2000, through June 30, 2001, period. Although such an extrapolation is not exact because the study is not totally random, it does provide a reasonable snapshot of the magnitude of employers and job seekers who have successfully used AJB to make a hire or get a job. The study extrapolated the findings for the year July 1, 2000, through June 30, 2001, as shown in Table 6.4.

Because the sample was not random, the extrapolated results provide only a broad range of estimates. We would expect the number of openings filled to be larger than the number of job postings for which a hire was made (since job postings may have multiple openings). This is not the case in the extrapolation. This is largely explained because the sample employers had on average 2.33 openings per posting, while for PY 2001 the average openings were only 1.6 for each posting. The estimate of 449,100 openings filled is very conservative and may well be higher. Also, we would expect the number of job seekers placed to be similar to the number of openings. While the sample does not allow such precision, there is another significant reason for the difference. The AJB permits job seekers to search and apply for jobs without registering with AJB, so nonregistered job seekers are likely to account for

Table 6.4 Extrapolation of AJB Outcomes Study Findings

AJB data for program year (PY) ending June 2001 (actual data):

- 6,962,692 new job orders posted.
- 11,228,690 new openings posted.
- 66,563 new employers registered; 226,274 total employers registered.
- 8,234,049 resume searches conducted.

Extrapolation of results for PY ending June 2001 for employers:

- Assuming 8% job order fill rate, an estimated 557,000 job posts led to a hire.
- At a 4% opening fill rate, an estimated 449,100 new openings were filled.
- An estimated 23,300 new employers and 79,000 total employers hired at least one person through AJB.

Extrapolation of results for job seekers:

- At a 10% placement rate, an estimated 345,000 people were placed through AJB.
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SOURCE: Unpublished data from TATC.

part of the difference. It is likely that the extrapolation of 345,000 job seekers finding jobs is lower than the actual figure. Based on these rough approximations, the data appear to show that at least 450,000 individuals were placed through AJB during the year, and it is likely that the figure is higher.

AUTOMATING LABOR EXCHANGE SUPPORT SERVICES: UNEMPLOYMENT INSURANCE AND ONE-STOP OPERATING SYSTEMS

In addition to the information and job-matching services provided through the public workforce investment system, USDOL and states have invested in a number of improvements to work processes to support customer needs. Automation has played a key role in supporting UI benefits and employer tax payments and in developing operating systems to better serve customers in one-stop career centers. The use of

technology to improve the way in which customers are served potentially makes it easier for the customer to obtain necessary services and can free up staff time to support direct labor exchange services.

Automation has dramatically changed the face of the UI system over the past few years for both beneficiaries and employers. As of August 2002, the status of computerized and telephone UI claims was as follows:

- Internet claims (systems that allow individuals to make UI claims over the Internet): 22 states had operational systems, 24 states were planning systems, 1 state was considering the possibility, and 6 had no plans.
- Telephone claims (individuals can make claims via the phone): 29 states had operational systems, 4 were partially implemented, 17 were planning systems, and 3 had no plans
- Telephone weeks claimed (individuals can confirm unemployment status over the phone after having registered): 44 states had implemented systems, 8 were planning such systems, and 1 had no plans.

These automation efforts by states have been supported by 35 state grants for Internet-enabled UI systems and 40 state grants for telephone-based UI systems. In most states, individuals now can register for benefits and subsequently confirm their UI status without coming into an office. This has allowed states to consolidate UI services, reduce costs, and provide efficient service to beneficiaries. However, the lack of contact between UI claimants and staff may impact negatively on the job search and other services that could help claimants find new jobs more quickly. While there are as yet no research study findings to confirm this (see USDOL 2002, pp. 140–142), it would still seem that a key consideration for states must be how they both link claimants to self-service tools on the Web and encourage them to visit the one-stop career centers for staff-assisted labor exchange and training services.

The expansion of USDOL-funded workforce development initiatives to provide universal service through the one-stop delivery system has led to efforts to use automation to streamline and organize registration and intake and determination of appropriate services for different customers. Both USDOL and states, or consortia of states, have funded different systems that generically are referred to as one-stop operating

systems. While the philosophy and features of such systems vary across states, the purposes of such systems generally are to provide staff assisted, self-service resources, and tracking capabilities. They are intended to allow staff to provide services to customers more efficiently and effectively, organize and provide access to self-service resources for direct use by customers, and record and keep track of customers, services provided, and outcomes. Table 6.5 lists features³ that are illustrative of those offered in the different versions of such systems.

Operating systems such as this can organize a wide range of work processes and information resources, allowing staff and customers to more easily manage and negotiate services facilitating labor exchange activities, both immediate job placement as well as longer-term preparation for the marketplace.

Another interesting state model designed to reduce some of the friction of labor exchange dynamics is a joint demonstration effort by ETA, the Georgia Department of Labor, and the Upjohn Institute for Employment Research to develop a Frontline Decision Support System (FDSS). While bearing some similarities to one-stop operating systems, FDSS is focused more specifically on providing tools and customized information about employment prospects and services (Eberts, O’Leary, and DeRango 2002). The system is comprised of two comple-

Table 6.5 Illustrative Features of One-Stop Operating Systems

• Intake–universal registration	• Automated registration of customers	• Scheduling
• Employer referrals	• Eligibility determination	• Identifying service strategies
• Case-management support	• Job search and matching	• Labor market and career information
• Processing UI applications	• E-mail notifications	• Reporting & data collection
• Assessment	• Employer relations	• Provider management & tracking
• Placement services	• Customer feedback	• Staff notes
• Employment plans	• Service tracking & outcomes	• Individual Training Account management

mentary modules that generate recommendations to help staff and customers make informed decisions regarding job prospects and service referrals. The Systematic Job Search Module includes a reemployment probability component to determine the likelihood of a person being employed in the industry in which he or she was previously employed (particularly useful for dislocated workers). A second component is an earnings algorithm to estimate the expected range of job earnings for a person. A third component is a related-occupations module that employs an algorithm to identify occupations related to the job seeker's previous occupation. Together, these components allow a dislocated worker to consider some alternative scenarios. Customers can explore questions such as, "What if I have to seek employment in a different industry, or train for a related occupation, what range of wages can I expect and what training might I need?" The information provided by FDSS can make contemplating such changes less threatening by filling in some of the unknown variables. These components use current labor market information to facilitate informed decision making.

Next, the Service Referral Module provides a list of available services, ranked in order of expected effectiveness. What makes this approach unique is that the rankings in this module are based on information derived from the experience of job seekers with characteristics similar to those of the person being served, using administrative data on the characteristics, services received, and outcomes of people who have participated in employment services offered by one-stop career centers in Georgia. The system also uses related occupations identified in the O*NET system as one input. The FDSS provides an example of the value of transactional data to improve the labor exchange process by using these data to inform the services provided to the customer. Such use of more "real-time" data to improve labor exchange services and outcomes is possible only because of advances in technology and information systems. The combination of more robust labor market information through standardized programs used in conjunction with transactional data may help to better link employers and job seekers, and to better prepare workers. The Frontline Decision Support System serves as a demonstration of such potential. An evaluation of the FDSS demonstration may aid understanding of its effectiveness and exportability to other states.

LABOR MARKET AND CAREER INFORMATION— MEETING MARKETPLACE NEEDS

Labor market information has long been a staple good provided through a federal–state cooperative program between state ES agencies and BLS, with funding support for several LMI-related activities from ETA. Labor market information has supported the needs of employers and job seekers, and of education and workforce development. However, the combination of technology, the Internet, new ways of organizing and sharing LMI databases, and, most significantly, the passage of WIA in 1998, have raised the status of LMI as a primary product and service under workforce investment programs.

WIA, as noted, extended workforce investment programs to a universal audience, with the idea that self-directed services may serve the needs of many citizens. Section 309 of WIA amended the Wagner-Peyser Act by adding a new Section 15, “Employment Statistics”,⁴ which states, “The Secretary [DOL] . . . shall oversee the development, maintenance, and continuous improvement of a nationwide employment statistics system . . .” Among the types of data to be gathered are employment, unemployment, industrial distribution of occupations, projected employment opportunities, wages, information on state and local employment opportunities, and other appropriate statistics related to labor market dynamics. Also required under WIA was the development of an annual plan on employment statistics developed for the secretary by BLS in cooperation with the states.

This language led to several developments. In the 1990s, ETA established the America’s Labor Market Information System (ALMIS), which provides both an infrastructure for research and development to improve LMI, as well as state funding to support customer-based products and improved quality of information. A Workforce Information Council (WIC), consisting of representatives from BLS and other federal and state statistical agencies, was set up to plan, guide, and oversee the nationwide workforce information system. The WIC prepares an annual LMI plan for the Secretary of Labor, thus providing for greater participation by states in the planning process and raising the visibility of LMI as a key USDOL product and service to the country. Much of

the information is intended to support improved labor exchange by informing both employers and job seekers of labor market conditions and opportunities and by enabling longer-term planning and preparation by individuals so they are better prepared to enter the labor market more quickly or keep current with changing skill needs. The Secretary of Labor's Workforce Information System Plan for 2001–2005 established three priorities: 1) strengthen customer feedback for continuous improvement; 2) work to fill critical data gaps, and 3) improve workforce information analysis and delivery.⁵ The WIC and ALMIS efforts are directly linked and support a vastly expanded LMI program that produces, wage information, industry estimates, occupational projections for about 450 areas of the country, and a host of other information.

Most critical is how USDOL and the states have worked to make such information available to the public. First, many states have developed sophisticated but easy-to-use LMI sites on the Web. Four of many examples are the Oregon Labor Market Information System (www.olmis.org); Washington's WILMA (www.wilma.org); North Carolina's WEBSARAS (<http://eslmi12.esc.state.nc.us/websaras/>); and New York's Career Zone (www.nycareerzone.org). Some of these systems, are also designed to support regional labor market analysis for economic development and planning purposes. These systems and information analyses go hand in hand with workforce investment activities to ensure that workers have the skills needed to attract new business.

In addition to sites operated by state LMI programs, there are literally thousands of other sites that provide occupational and career information and services, some proprietary, some public. Among the most important are career information delivery systems (CIDS). These systems are integrated and comprehensive, providing labor market information, occupational characteristics, and education and training program information in a career development framework. Many states have adopted a particular system statewide, though individual school districts may select different systems as well. Most of the systems are licensed, with a school or school district or state paying a licensing fee for their use. Nearly all CIDS are available on the Web as well. All CIDS include various search capabilities, assessments, and detailed information brought together from many different sources.

CIDS have been leaders in the use of technology, with automated mainframe systems appearing in the late 1960s and early 70s, migrating to microcomputers and networks in the 80s and now available on the Web as well as through local networks. These CIDS reach millions of users throughout the country, and nearly all of the major CIDS are now linked to AJB at the occupational level, allowing a user to explore an occupation on CIDS and link directly to the America's Job Bank to explore job openings information, without having to respecify the occupation or state.

To find state LMI, CIDS, and other key information sites, ACINet provides an excellent set of links at <http://www.acinet.org/acinet/library.asp>. When you reach that page, select "Career and Labor Market Information" under the heading "State Resources." Many other states have developed customer-oriented LMI systems, and many are adopting similar systems and customizing them as appropriate to their state.

COMMON LANGUAGE FOR OCCUPATIONS

The O*NET system developed by USDOL supersedes the Dictionary of Occupational Titles and provides a common language to describe occupational knowledge, skills and abilities, worker requirements, tasks, generalized work activities, related interests, and other attributes. "O*NET is the first available system with planned national scope that brings together the most current category and enumerative systems and the most comprehensive descriptive analytical systems and makes the data readily available in electronic form."⁶ O*NET occupations are fully compatible with the Standard Occupational Classification (SOC) system using the same codes, although the O*NET database provides additional occupations within the SOC framework. This integration with the SOC is key, because data such as occupational estimates, projections, and wage information collected by the federal government and by state LMI divisions are collected at the SOC level. As a result, it is now possible for both public and private information and application developers to provide customers, easily and transparently, with information on occupational characteristics and requirements

(from the O*NET database), along with key LMI related to the occupation. A good example of such power was noted earlier in this chapter in the descriptions of the CareerOneStop products. A customer can search for job openings for welders in Missouri and then link directly to information about welders in ACINet, which includes occupational projections, estimates, and wages along with O*NET characteristics and requirements information, without the need for the customer to reenter information on the search. Once the customer selects the occupation and the state, he or she simply moves between the systems. Similarly, a person could begin career exploration in O*NET OnLine, link over to ACINet by specifying the state, and explore wages and trends information about that same occupation. One could then move to job openings in AJB without having to reenter the occupation or state. Such links are only possible because of the common language afforded by the SOC/O*NET system, the detailed occupational attribute information available in the O*NET database, which is available electronically.

USDOL made an operational decision to provide O*NET information as an electronic database available for free to private and public application developers and, most significantly, *that the primary means of providing O*NET information to the end-line customer would be through such private or public (particularly state agencies) developers rather than the federal government serving as the principal developer of applications.* This strategy has proved very successful, with hundreds of vendors downloading O*NET from the O*NET Center Web site and developing applications based in part or in total on O*NET.⁷ As a result of this approach, O*NET information reaches tens of millions users through state LMI Web sites, through private and public CIDS, through ACINet, through human resources information systems, and through many other sources. The O*NET classification serves as the underlying occupational structure for systems such as AJB and for some proprietary job openings systems, as well.

In addition to the O*NET database, there are three O*NET Career Exploration Tools: O*NET Interest Profiler, O*NET Work Importance Locator, and O*NET Ability Profiler. After a customer takes one of these assessment instruments, the results are tied to O*NET occupations so that an individual can identify and then explore information about the occupations that best match the results of his or her assessment. All of these tools are intended for career planning and explo-

ration to help an individual identify and prepare for the skill requirements of the workplace. Several public and private vendors have computerized the first two instruments (which are designed for both self and staff-assisted service use) and built them into their information systems. Already some systems are available that allow a person to take one of the O*NET assessments on the Internet, access information on occupations that best match the resulting scores from O*NET and LMI sources and then link to AJB—all seamlessly. In addition, several organizations that have developed their own proprietary assessment instruments over the years have now tied their systems to O*NET occupations, and individuals using these assessment tools can be linked to O*NET information as well as LMI and job openings.

Never before has such capability existed for employers, individuals, and intermediaries to so easily use and move between assessment tools, occupational characteristics, LMI, and actual job openings. The implications for improved labor exchange are enormous, allowing individuals to better plan and prepare for workplace needs based on easily accessible information and support tools and services. The public labor exchange and workforce investment systems have played a major role in this effort by working collaboratively with the private sector to provide better LMI and more detailed links to AJB and other USDOL products, and by building a common SOC/O*NET occupational language that provides a foundation for interconnectivity among various information resources.

LOOKING TO THE FUTURE—ISSUES, RESEARCH, AND PROSPECTS

Automation and the Internet have altered the labor exchange process, but the exact nature of the consequences remain to be seen. It is likely that there will be overall gains in the efficiency of labor exchange dynamics, but as is the case with the economy in general, not everyone will enjoy these benefits equally. There are a number of potential issues and opportunities that arise as a result of the ease of electronic access between employers and job seekers and the growing wealth of labor market information, several of which we consider below.

First, there is a risk that the increased capabilities of automated systems to provide easier connections among employers and job seekers may reduce the perceived need for staff-assisted services. Disinvestment in staff-assisted services could put at risk those individuals most in need of intensive workforce investment services. It is important that the public investments in improved automated labor exchange services are used to help frontline staff serve customers more effectively and identify those who require more staff-assisted services and then provide the appropriate interventions. Staff-assisted services are crucial to meeting the needs of many citizens and employers.

Second, the very ease with which job seekers can locate jobs on the Internet and with which employers can advertise jobs and search resumes paradoxically could lead to both frustration and inefficiencies in automated labor exchange. Job search and submitting job applications on the Web comes with little cost to the job seeker other than time (which is significantly reduced), and job seekers can easily send resumes to many different employers. This potentially could lead to too many resumes for employers and, for the job seeker, too many competitors for the same job. From the employer's perspective it may be difficult to judge quality resumes, and some job seekers may begin to view the search as akin to a lottery system. Autor (2001, p. 30) addresses this issue by suggesting we group information into low and high bandwidth categories. Low-bandwidth data are items that are verifiable, such as diplomas, certificates, credentials, previous salaries, and experience. High-bandwidth data relate more to personal traits, including motivation, quality of work, worker relationships, commitment, or reactions to work situations. The Internet can transmit information related to low bandwidth, but high-bandwidth information generally requires personal interactions; even then, a simple interview often does not suffice. Of course, this is not a new phenomenon, but rather a very natural part of the labor exchange dynamic; however, with the Internet, the issue looms larger.

Even with types of low-bandwidth data, verifying the information in the resume may be problematic. There is a growing interest in standardizing certain types of information, such as verifiable certifications that could easily be checked by an employer. For high-bandwidth information, services on the Web might expand to include additional information, such as samples of work products, evaluations from previous

clients, or online assessments. Ironically, such information needs may lead to new organizations or expanding services by public and private employment agencies to verify information and serve as the intermediary between employers and job seekers, moving away in some cases from the direct employer/job seeker connection. Both employers and job seekers might work with outside organizations (many of which may be Web-based) that carry out the initial resume, job search, and verification, and then present a portfolio of promising candidates to the employer or a list of jobs to job seekers. The public ES has long provided such services, and while about half of the jobs on AJB are direct postings by employers (or staffing agencies), the growth of such Internet capabilities could lead to new opportunities for the one-stop career centers and public ES systems to provide more rather than fewer staff-assisted services for employers and job seekers.

There may be an initial tendency by job seekers to rely too much on the Web for job search, which could lengthen, rather than shorten, the job search. The Web should be considered one more facet of the job search. Job seekers should use the Web not just to search for job openings, but as a job and career research tool to find out about employers, skill requirements, education, and training.

Job and career counselors and facilitators should view the Web as a significant tool to better serve customers and build their expertise in using the Internet as a research “library,” and not just a quick source of job openings information or LMI. The critical need is for human resource development specialists to learn to use and perceive the Internet as a time saver that provides an opportunity for more “quality” time with their customers, rather than one that detracts from their client service.

An area of great potential is the use of job openings information from the Internet as transactional information to identify changing employer skill needs and emerging occupations. For the public sector, investment in analysis of AJB transactions may serve as a first step. Ideally, a consortium of public and private job search sites that are willing to share information that could then be searched using data mining software would provide a more robust source that better reflects the overall economy. Over time, regular analysis of a select number of job search sites might be used to provide more real-time information on current occupational demand, wage rates, and other labor market trends. Such

data could supplement and complement data developed by BLS and state LMI divisions, providing a more dynamic view of the economy.

USDOL might consider larger scale studies of AJB use both to identify improvements and also as a means of understanding the dynamics of labor exchange processes over the Internet. This information could be invaluable for employers, job seekers, and workforce investment professionals on how to use Web services more effectively, and for DOL and states to improve labor exchange services. In addition to expanding the number of employers and job seekers who might be included in studies similar to the first AJB study, information could be gathered from one-stop services (including UI) that provide intermediary services between employers and job seekers to determine how many jobs are filled and job seekers placed using AJB when an intermediary is involved.

CONCLUSION

Use of the Internet as a means for job search and labor exchange will likely grow, although there will be a shaking out of the various players and tools provided. The public ES system will be a direct player in the system. Beyond that, USDOL and the public sector in general can play a major role in working to reduce inequities in access to information and services. As envisioned under WIA, continued or even expanded emphasis on staff-assisted services is one means to achieve equity in service delivery. Another important goal for the public sector is to continue to maintain and enhance a high-quality nationwide LMI system and provide such information through public applications and products, as well as encourage private sector dissemination of such information in customized applications. In partnership with the private sector, USDOL also could encourage expanded use of job openings information as a source of real-time transactional information to provide greater insight into changing skills and market needs.

Finally, the public workforce investment system can work to build the skills of employers and job seekers to better use self-service products and resources. Providing guidance and instruction on the use of resources and career planning will help individuals take direct responsi-

bility for their career planning, preparation, skills development, and job search, and over time will require less staff-assisted service in future career or job transition activities. Ultimately, a successful labor exchange system depends in large part on the flow of quality information between the job seeker and the employer—a challenge that the public workforce investment system has taken on for the last 70 years.

Notes

1. See Chapter VII for discussion of his theory on how the free market grows as a result of changes in technology, new work processes, etc. that tear down the old structures and build new ones. The growth of information technologies and the Internet provide a remarkable example of Schumpeter's theory, first published in 1942, at play. The same effect seems to be playing out in the labor exchange process, though it is too early to judge how different the labor exchange process will ultimately be.
2. See Yavitz, Morse, and Dutka (1973) for a discussion of job market versus the broader labor market.
3. For examples of features in a specific system, see the America's One-Stop Operating System Web site: <http://osoinfo.ajb.org/>.
4. Prior to WIA, the Wagner-Peyser Act, CETA, and JTPA all had requirements for labor market information. The WIA is significant because it outlined in much greater detail the parameters of a nationwide LMI system, it required development of a plan by state and federal partners, and it provided emphasis on the provision of LMI and career information as a primary or core service to support both employers and job seekers.
5. The plan provides additional details for each priority. To access the plan go to the WIC Web site at <www.workforceinfocouncil.org>.
6. See National Research Council (1999, pp. 5–7) for implications of changing nature of work to classification systems and the aegis of O*NET.
7. See <www.onetcenter.org> for information on O*NET system, databases, and other products, resources, and services.

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