IMPACT OF THE INTERNET ON THE RECRUITMENT OF SKILLED LABOR

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Executive Summary

Given the explosive growth of the Internet, the strong economy and record low unemployment rates at the end of the 1990s, construction organizations are increasing their use of the Internet as a recruitment tool. The growth of the Internet in the United States is increasing and more Americans are gaining Internet access. The Internet economy is changing the way business is conducted by opening new avenues of communication, collaboration and coordination between consumers, businesses and trading partners.

Recruiting using the Internet is growing and the construction industry has been slow to adapt. Advantages of the Internet recruitment include lower recruiting costs, faster recruiting cycle, higher caliper recruits and increased audience reach. Potential barriers to Internet recruitment include the digital divide, limited Internet access, usage problems and flawed infrastructure. It is premature to assess the role of the Internet and the controversy surrounding union salting.

Construction organizations use the Internet for recruitment of professional, executive and administrative staff. Construction organizations could expand their Internet recruiting strategies to include the skilled labor workforce to attract workers and obtain a competitive advantage. There is a potential opportunity for construction organizations to use the Internet for recruitment of skilled labor. This is an area that may have been overlooked by construction organizations to enhance recruitment of skilled labor.

Results of a survey of construction executives from 18 organizations indicated that the classified ads and employment agencies were the primary channels for recruitment of professional, technical and administrative staff. Word of mouth, union hiring halls and classified ads were the primary channels for recruitment of skilled labor. None of the organizations use the Internet as a primary or secondary channel for

recruitment skilled labor. Results of the survey indicate that the Internet is seen as a valuable tool in recruitment and varies dramatically with respect to labor type. Eighty-three percent of the responding organizations indicated that the Internet is a valuable tool for recruitment of professional, technical, and administrative staff. Only 44% of the responding organizations indicated that the Internet is a valuable tool for recruitment of skilled labor. The organizations responded that the greatest benefit for using the Internet, as a recruiting tool includes: increased audience reach (50% of surveyed organizations) followed by convenience (28%), reduced cost (17%), and reduced time 11%, respectively. Survey respondents indicated that the most frequent response for improvements in the Internet was improvements in on-line recruiting sites. Best practices for the construction industry include a business model consisting of four main functions: attract potential skilled labor to web site, meet their information needs, simplify the application process and streamline the processing of applications. Key factors and features to consider and evaluate include cost of web hosting, staffing and training personnel, level of depth for integrating the online recruiting strategy, security, reliability, redundancy, scalability, measuring success and return on investment. This report concludes that few construction organizations are leveraging the capabilities of the Internet for recruitment of skilled labor.

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Introduction

1.1 Introductory Statement

With the explosive growth of the Internet over the last several years and a strong economy with record low unemployment rates, companies are expanding their use of the Internet as a recruitment tool to attract good workers and obtain competitive advantages. Recruitment using the Internet has typically focused on professional, executive and technical positions across many industries; but it is especially widespread in the high technology sector. As the doors of Internet access are opened to more people and as the digital divide shrinks through less expensive computers, Internet service providers, Internet appliances and other Internet access devices, Internet recruitment for many types of jobs and positions across many industries including construction have the potential for increased application and growth.

As of the year 2000, construction companies mainly used the Internet for recruitment of professional, executive and administrative staff. The use of the Internet for recruitment of skilled labor and craftsmen was not yet a common practice within the construction industry. Construction companies could expand their Internet recruiting strategies to include the skilled labor workforce to attract good workers and obtain a competitive advantage. This report explores the potential of such a strategy.

1.2 Objectives

The study reports on the results of a research project performed for the Center for Construction Industry Studies. The primary objectives of this study were the following:

1. Provide a snapshot and assess the status of the Internet for recruitment of skilled labor in the construction industry.

2. Investigate the Internet as a potential beneficial tool for the recruitment of skilled labor.

The study aimed to assess the use of the Internet for recruitment of skilled labor to determine potential Internet recruitment strategies and to implement the strategies more effectively.

1.3 Methodology

The first step in the research effort included a literature search and review of related topics. The related topics included skilled craft worker characteristics, craft worker shortage, and recruitment of skilled labor, history and growth of the Internet, the Internet economy, Internet recruitment and Internet productivity. Articles, theses, and dissertations relating to skilled labor, recruitment and the Internet were reviewed.

The second step included telephone interviews with executive level managers of general contracting firms. The purpose of the telephone interviews was to assess the status and current practice of Internet recruitment for skilled labor from the employer's viewpoint and to identify key issues and attitudes facing the industry for Internet recruitment. Over a three-week period, the author conducted four telephone interviews. Results from the telephone survey were used to develop a written survey.

The written survey was distributed to over 56 organizations. The collected survey data was analyzed and interpreted with results reported in this report. The report includes conclusions of the research, best practices for the construction industry and recommendations for further research.

1.4 Report Structure

The structure of this report follows a conventional format. Chapter 2 includes a brief discussion of other research results and studies conducted on Internet recruitment. Chapter 3 describes results of the survey. Chapter 4 presents best practices for the construction industry. Chapter 5 presents conclusions and recommendations drawn from this research.

Chapter 2

Background and Literature Review

This chapter provides background information for the research effort. The literature review for this research indicated that the Internet is growing rapidly as a tool for communication, collaboration and coordination in conducting business. The Internet is used by many industries for recruitment of employees, but the construction industry has been slow to follow for hiring skilled crafts workers. Limited research has been performed in this area and experts are researching and debating the impact of the Internet on productivity.

2.1 Recruitment in the Construction Industry

Recruitment in the construction industry varies from one company to the next. In a 1999 study, FMI Corporation, Inc., found that construction firms are using several resources for recruiting. The survey questions did not differentiate between skilled labor employees, professional, technical and managerial staff. Classified ads and referrals are used by approximately 95% of respondents. The second most popular choice for recruiting is employment services used by 86% of the respondents. Approximately 75% participated with on-campus recruiting and approximately 72% used Internet-based recruiting for filling positions. Approximately 69% of the firms used publications as a channel for recruiting (FMI 1999).

Typical recruitment of skilled labor in a merit or open-shop firm varies from company to company. Contractors typically access a labor pool or maintain and update a database listing of crafts workers who worked on prior projects for the company. Some contractors have project teams that follow and move to new projects. Some site superintendents rely on employee referrals and a "good old boy" network for hiring skilled labor (Zimmerman 2000). Advertising in newspapers, classified ads, bulletin boards, radio and television, publications, employment firms, temporary agencies, on-line

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recruiting from job boards and corporate web sites and posting help wanted signs are other channels used to recruit skilled labor. Some recruit from job fairs, high schools, vocational schools, community colleges and even prisons (FMI 1999).

Recruitment of skilled labor in union halls use many of the same channels as merit or open-shop firms. In strong union cities and geographic areas, union halls actively recruit local residents, friends and family members in the community to join the union. Union halls recruit crafts workers to join the union whereas some merit and open shop firms recruit based on project specific needs. A company that needs union craft workers for a project will phone the business agent or business manager at the union hall who will, in turn, recruit union members to staff the project. Strict labor union rules govern the recruitment and staffing of union projects (Zimmerman 2000).

2.2 History and Growth of the Internet

Some background information on the history and growth of the Internet is provided to understand the context of this recruitment channel. The Internet is a worldwide group of public and private computers linked together to exchange information. The Internet began as the ARPANET during the cold war in 1969. It was developed by the U.S. Department of Defense's (DOD) in conjunction with a number of military contractors and universities to explore the possibility of a communication network that could survive a nuclear attack. It continued simply because the DOD, its contractors, and the universities found that it provided a very convenient way to communicate (Barua & Whinston 2000).

The main purpose of the Internet is to share information. No one owns the Internet, nor is it controlled or regulated by anyone. There is no single governing body, such as the Federal Communications Commission (FCC), that regulates the Internet. However, many of the general laws and legal principles that have developed over the years in other fields, such as computer law, copyright, libel and trademark also apply to

the Internet (Freeadvice 2000). It is a true universal, shared resource (Netscape 2000). The Internet offers a variety of services. The two most popular are the World Wide Web (WWW) and electronic mail (email). Other commonly used services include newsgroups, file transfer, chatting, and searching. The web is a collection of electronically linked documents that are stored on the Internet. The Internet is made up of an immense network of computers of all different types--from huge government mainframes to networked workstations to office or personal computer. Users connect to the Internet by an Internet Service Provider (ISP) or by a Local Area Network (LAN). ISPs are companies that bring World Wide Web access to individuals. The ISP pays for a very high-speed connection to the Internet and then offers the user access to that connection for a monthly or hourly fee. A LAN connects to the Internet and is managed by a company, school, university, or other institution. Once linked to the Internet, a user can access files and programs stored on other computers and send email messages to anyone else who has an Internet account (Netscape 2000).

Physically, the Internet is a vast network of wires. Multiple high-speed "backbone" cables carry information to a series of other network cables (or nodes), which in turn carry information to smaller outlying cables, and so on. The resulting diagram of the Internet would look like a vast overlapping series of finer and finer strands encompassing the globe.

Growth of the Internet has increased the last several years. Some claim this is due to the Internet facilitating interaction with human behavior and habits. Parrish (1997) states, "It is not just a dynamic network medium but-perhaps just as important-a quickly growing communication infrastructure."

People access the Internet from several locations including home, work, school, library or community center, in addition to, new wireless devices that provide access essentially anywhere within the network range. In 1998, the U.S. Department of

Commerce indicated that almost one-third (32.7%) of Americans use the Internet while approximately 67.3% do not use the Internet as shown in Figure 2.1.
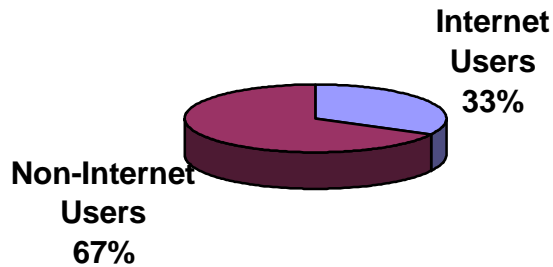
Figure 2.1 Percent of U.S. Internet Users in 1998
(U.S. Department of Commerce)

According to Forrester Research, an independent research firm, based on a January 2000 representative mail survey of more than 80,000 households, 43% of U.S. households surveyed have Internet access from home as shown in Figure 2.2 compared to 35% in 1999 for an annual growth rate of 23%.
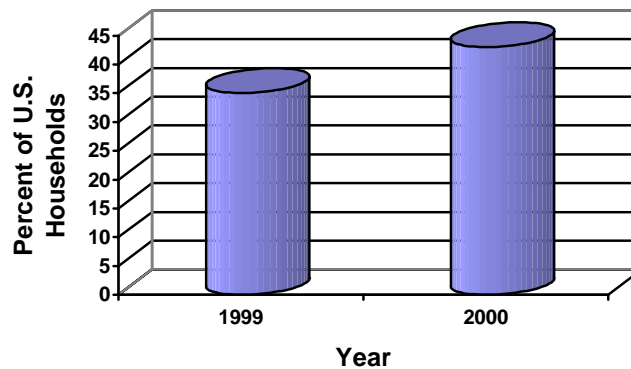
Figure 2.2 Percent of U.S. Households Connected to the Internet in 1999 and 2000 (Forrester 2000)

2.3 Internet Economy

The Internet economy has revolutionized and changed the way business is conducted by opening new avenues of communication, collaboration and coordination between consumers, businesses and trading partners (Barua & Whinston 2000). The Internet has evolved from a marketing channel into a complete economic system consisting of:

- Low cost communication networks using Internet technologies and standards
- Software, applications and trained people that enable business to be conducted over this network infrastructure
- Interconnected electronic markets that operate over the network and applications infrastructure
- Producers and intermediaries providing a variety of digital products and services to facilitate market efficiency and liquidity
- Emerging policy and legal frameworks for conducting business over the Internet (Barua & Whinston 2000).

The key characteristics of the new economy are information, knowledge and speed. Barua & Whinston describe that in traditional or sometimes known as the old economy, companies rely on physical assets to create value. In the Internet Economy, companies are relinquishing information and customer knowledge, and leveraging Internet based partnerships with suppliers and contract manufacturers to do business in the most productive and efficient manner (Barua & Whinston 2000).

An Internet Economy company is a company that generates some or all of its revenues from Internet or from Internet-provider-based products or services. This includes products that are designed for use for the Internet, or services to help other

companies develop and implement an Internet-business strategy, or selling products and services over the Web (Barua & Whinston 2000).

The Internet Economy in 1999 grew 62% in 1999 to approximately $525 billion (Barua & Whinston). The architecture, engineering and construction (AEC) dot com industry is estimated at $2.3 billion as of July 2000 according to a joint study by the digit group and the GartnerGroup (Primavera 2000). This consists mainly of an externally-hosted, subscription-based project extranet website. An extranet provides controlled-access to a project website to download, view, update and store project documents. Other e-business applications for construction include B2B (Business-to-Business) e-marketplace enabling online bidding and purchasing of products, materials and services. Some sites provide specific business needs such as permitting, subcontractor lists, project management, equipment sales and rental, estimating, product catalogs, etc. (Primavera 2000).

The appeal of doing business on the Web is obvious. The Internet brings together buyers and sellers of goods and services and by automating transactions, web markets expand the choices available to buyers, gives sellers access to new customers and reduces transaction costs for all the players (Kaplan and Sawhney 2000). This concept can be extended to construction labor services especially from the perspective of the employer as buyer of labor and the employee as seller of labor. The Internet is a medium to facilitate this transaction of buying and selling labor.

2.4 Internet Productivity

The next several paragraphs discuss Internet Productivity from a macroeconomic and microeconomic perspective. On a macroeconomic level, some claim that the advances in Information Technology (IT) and in particular the Internet has attributed to the generally favorable economic performance of recent years including low inflation, low unemployment, and the apparent acceleration of productivity growth. (Blinder

2000). Blinder indicates that this economic performance has coincided at about the same time as the rapid growth of the Internet. Blinder stated:

> It is impossible to make a definitive judgment until sufficient time passes to gain some historical perspective, but some evidence points to a recent acceleration of productivity growth-and therefore, of sustainable Gross Domestic Product (GDP) growth—at about the time the Internet was diffusing rapidly through the economy." (Blinder 2000).

On a microeconomic level, the majority of companies that are leveraging the Internet indicate that the Internet increases productivity. In a study, 73% of Internet Economy companies said they saw increases in employee and equipment productivity compared to increases in only 29% of all firms sampled (Barua & Whinston 2000). However, this was based on responses from the company's perception but did not include analysis of measurable data to defined metrics.

Blinder indicates that the basic idea is that advances in information technology make more information available faster and cheaper, and that better, timelier information leads to better business decisions.

In the construction industry, growth of Information Technology (IT)-including the Internet-began with the introduction of the computer. According to Doherty, strategic IT in the construction industry has evolved from computer-aided businesses that use computers for reports, CADD drawings, and correspondences to computer-integrated businesses created through connectivity of hardware, software and Internet applications. This has evolved into information-based businesses with technologies that are transparent to business, similar to four walls that define an office, and demonstrates the true power of IT in a cost and time effective way (Doherty 1998).

The parameter, Return on Investment (ROI), for IT is difficult to measure. In a 1999 survey by BST Consultants of 148 CEOs in the construction industry contractors, architects and engineering firms spend, on average, 3% to 6% of their net revenue on

information technology including computers and Internet tools (ENR 1999). More than 50% of respondents expressed difficulty in measuring return on their IT investments. According to the survey, 7% indicate they have been very successful at determining ROI for IT. CEO's perceive technology as an integral part of their organizations and a critical competitive tool according to ENR; however ROI is difficult to quantify.

2.5 Internet Recruitment

Companies and job seekers use the Internet in many different ways during the recruitment process. Some companies provide job postings on their corporate web site. A potential job seeker identifies a particular company or, through an Internet search, clicks onto the employment or career section of the corporate web page. Job postings and information on various positions are available for review by the job seeker including instructions for applying for the position.

Recruiting with corporate web sites is a common practice in the digital economy of today although not the main objective for companies to host web sites. Chmeilewski quotes a survey of 1,400 technology managers concerning objectives of a web presence. The survey identified specific objectives for hosting a web site as shown in Figure 2.3. Advertising, marketing and public relations accounted for 66% of the business objectives and employee recruitment for 2%.
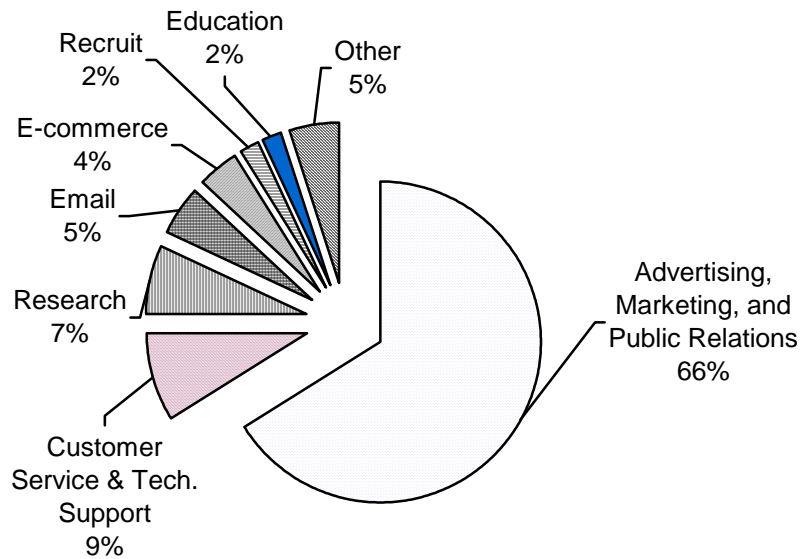
Figure 2.3 Objectives of Hosting a Web Site (Chmielewski 1997)

A 2000 survey found 79% of the Global 500 Companies recruit on their Web sites as shown in Figure 2.4 (recruitsoft.com/iLogos Research 2000). The Global 500 is a list of the largest companies in the world, by gross revenue, according to Fortune Magazine. In 1998, 29% of these companies had corporate Web sites for recruiting growing to 60% in 1999. In 2000, the Global 500 companies have reached a significant milestone with the adoption of the corporate Web sites that include information for investor relations, marketing, product information, customer relations, e-commerce and for recruiting (recruitsoft.com/iLogos Research 2000). According to the survey, over 90% of Global 500 companies were based in North America were Web site recruiters in the year 2000.
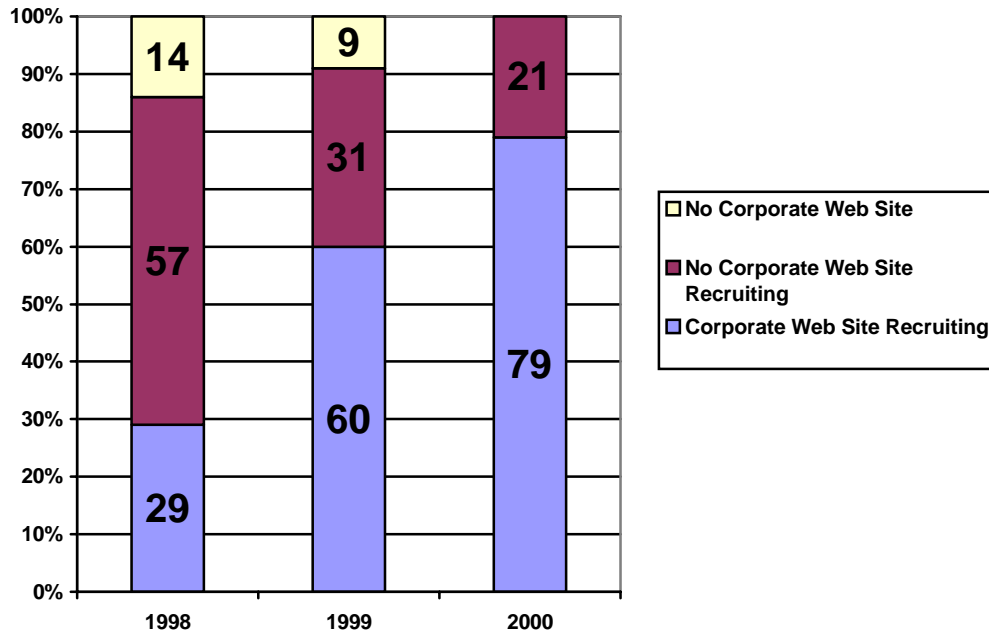
Figure 2.4 Recruiting on Corporate Web Sites of the Global 500 Companies (Recruitsoft.com/iLogos Research 2000)

Corporate Web site recruiting methods can generally be defined as either e-centric or basic recruiting (recruitsoft.com/iLogos Research 2000). For the survey, e-centric recruiting is defined as "the practice of posting jobs online and using e-mail or a resume builder on the Web site to receive applications." Approximately 46% of the Global 500 companies used e-centric recruiting during 2000.

Basic recruiting is defined "as using the Web to post job openings but encourage candidates to apply to the company through more traditional hiring channels, such as by mail or by fax." Approximately 33% of Global 500 companies use basic recruiting in 2000.

Another method of recruitment over the Internet is on-line job boards. Companies subscribe to an on-line job board and post available positions, sometimes anonymously. Job seekers visit the job board for potential opportunities. In addition, job

seekers may post their resume with the on-line job board for companies to search and match skills and needs. Some on-line job boards automatically notify a registered company via e-mail each time a job seeker responds to a specific posting and each time a new seeker posts a resume using a title that matches company needs (Feldman 1999) as well as job boards notifying job seekers via e-mail of new related job postings. The user can also input keywords and the database will search and match keywords. Popular job boards include monster.com, hire.com, headhunter.net and, specific to the construction industry, tradejobsonline.com and constructionjobstore.com. In October 2000, monster.com claimed to have over 450,000 job postings on its site.

Costs for posting job openings is fairly consistent and competitive between job boards at $100-$200 per posting (Leonard 2000). Typically, job boards allow 10 postings per month plus access to the resume database of $400-$500 per month. Large companies that hire thousands of employees with unlimited postings and database access may pay $100,000 or more per year (Leonard 2000). Some say that the costs compare favorably with placing jobs in newspapers, and in some cases, the job boards may be more cost effective (Leonard 2000).

A third and, less common method, are to recruit passive candidates (those not actively searching for a position) over the Internet. On-line recruiters called source strategists are using recruitment sourcing techniques to track down potential candidates on the Internet. A source strategist may search personal web pages to association sites to locate, identify and find potential candidates to fill a position (HR Magazine August 2000).

Companies recruit over the Internet with their own in-house human resources department or they may outsource the work to professional consulting services that provide recruiting services. Similarly, companies may host the web site in-house or off-site with an application service provider (ASP). With the increased expansion of web

site recruiters and online recruiting activity, Crispin claims that at least 30,000 web sites are trying to gain a piece of this market (Crispin 2000).

As discussed earlier, the FMI 1999 study indicated that 72% of construction companies surveyed used the Internet for recruiting. Since construction is not a technology intensive industry, Seneviratne claims the industry has been slow to acquire and implement new information technologies (Seneviratine 1999). This thesis will investigate the impact of the Internet on recruitment of skilled labor and determine the use by the construction industry.

2.6 Potential Advantages to Internet Recruitment

The Internet creates the advantage of providing current information to a broad audience and improving communication in an efficient and timely manner. In addition, some see the Internet as a low-cost advertising medium that facilitates paperless, real time transactions (Seneiratine 1999). This includes applications for Internet recruitment.

The potential advantages of using the Internet for recruitment are many. Recruitsoft.com/iLogos Research indicates that in a 1998 survey of 45 companies that are "at the leading edge of Internet recruiting" that companies can achieve the following: 1) lower recruiting costs, 2) faster recruiting cycle and 3) higher caliber recruits. Internet recruiting reduces costs and streamlines the process of reviewing thousands of resumes and conducting hundreds of interviews (Business Wire 2000). Typical costs associated with Internet recruiting include developing and maintaining the employment section on the web site and subscribing to on-line career boards. Limited data is available that compares recruiting costs through various channels. However, according to a major computer manufacturer, Internet recruiting provided the lowest cost as compared to campus recruiting, job fair, newspaper and headhunter for recruitment of an employee with a $50,000 annual salary as shown in Figure 2.5.
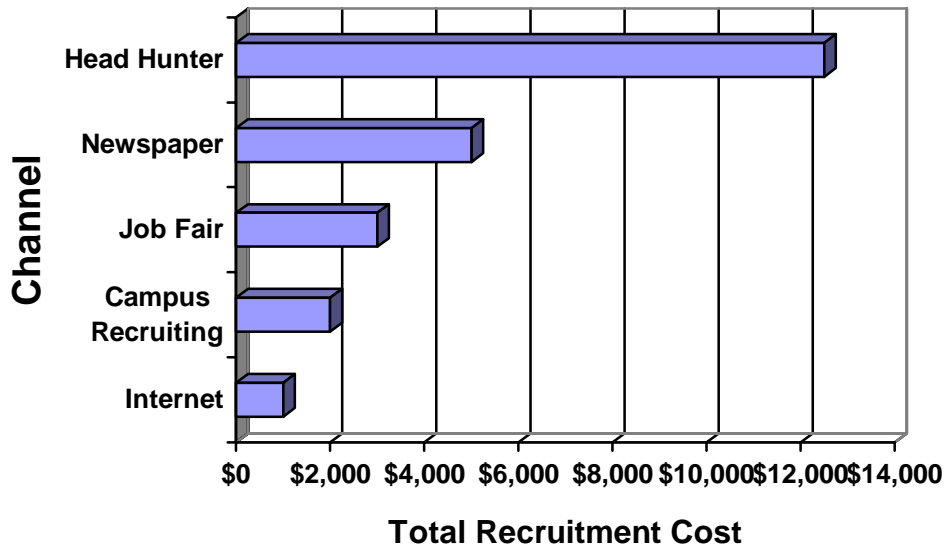
Figure 2.5 Total Recruitment Costs per Employee by Channel in 1998 for a Fortune 500 Computer Manufacturer (recruitsoft.com/iLogos Research 1998)

Companies can achieve cost savings in several areas including reduced direct costs of newspaper advertisements, job fairs and headhunter fees. Costs can also be reduced through less mailing incurred costs as communications are sent by e-mail. Recruitsoft.com/iLogos claims that with a properly implemented Internet recruitment strategy, a reduced workload for the human resources department can reduce costs.

However, the 1998 study found that 61% of surveyed managers reported that Internet recruiting causes the same or less work for the human resources department (See Figure 2.6). The Internet automates a number of manual tasks including less envelopes to open and resumes to sort, no need to scan resumes and less letter responses acknowledging receipt of resumes. Approximately 33% of the firms surveyed indicated an increase in workload with Internet recruiting. The study indicated that this was due to companies that had not integrated the Internet as a business tool and used the Internet simply as a broadcasting or marketing channel.

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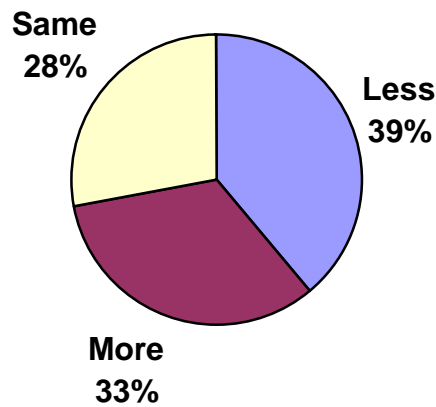
Figure 2.6   Workload for Human Resource Department with Internet Based Recruiting (recruitsoft.com/iLogos Research 1998)

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The survey also indicated that 67% of recruiting managers believed the Internet has made for faster recruiting times. The survey claims that Internet technology can shorten or reduce 12 days from a typical recruiting cycle. The actual timesavings vary greatly from company to company. The Internet can speed up the recruitment during three stages including faster postings of jobs, faster applicant response and faster processing of resumes. With the Internet available twenty-four hours, seven days per week, both employers and job seekers have greater flexibility and fewer barriers to respond to positions.

The Internet assists gathering, filtering and managing information. When the HR Department receives a resume, the Internet can speed up the processing period by automating four tasks. Job seekers have inputted all the required information electronically, there is no need to open envelopes, re-input the data or scan the resume.

The company can send out confirmation to the applicant that they have received the resume by email immediately and automatically. Software packages can intelligently search resumes for keyword terms and automatically perform a first screening of candidates. The HR department can instantly send the file electronically to line managers, instead of using a slower internal mail system. The Internet improves the communication process.

In addition, 70% of the surveyed companies indicated that the Internet plays a role in helping the company to attract high-caliber people although this is difficult to measure.

The Internet has several advantages in recruiting in both strong economies (i.e. low unemployment) and weak economies (i.e. high unemployment). In a low unemployment economy with a high job turnover rate- such as the conditions prevailing in the United States during the late 1990s-with a limited and competitive labor pool, Internet recruiting is seen as a good source to reach desirable passive job seekers and alleviate recruitment pressure. Internet recruiting makes it easy to look for and change jobs and online recruiting is becoming the leading medium to successfully reach passive job seekers at reduced costs (recruitsoft.com/iLogos Research 2000).

Conversely, in weak economies with high unemployment rates, Internet recruiting provides a manageable highway of job seekers to flood corporate recruiters. Internet recruiting can efficiently filter and process large volumes of job candidates to select the best person for the position.

Corporate Web sites can be the central place for recruiting efforts, especially among large corporations, which enjoy strong branding and significant Web site traffic. More than ever before, applicants judge a company by its technology and creativity in recruiting. The Internet has become a way for employers to display company image and advantages over competitors (Rotella 2000).

Internet recruiting is becoming a popular solution to the construction labor shortage, according to Hornberger (1998) and he states: "The increased turnaround, minimal recruiting cost, and favorable candidate demographics make the Internet a potential solution to the labor shortage." Some of the benefits he points out are: convenient accessibility for both the recruiting firm and the job seeker (jobs are posted 24 hours a day, 7 days a week), and immediate feedback (via online communications) which results in a faster hiring cycle and reduced cost per hire.

Many predict that the Internet will become more popular as a recruiting tool in the future. Construction firms may need to become more savvy with Internet recruiting in order to compete for qualified and technologically capable workers. Some experts warn that organizations that ignore the Internet's recruiting power risk falling behind their competitors. Crispin states "The demographics of the next few years absolutely dictate that everyone cannot win this war for talent" (Crispin 2000).

2.7 Potential Barriers To Internet Recruitment

Regardless of the widespread growth of the Internet and the inherent advantages of this new technology, there exist significant shortcomings from both a demographic and technological perspective. The Digital Divide affects many demographic groups in America and technology barriers including limited access, usage problems, and flawed infrastructure affect all (Brake & Lawrence 2000).

2.7.1 Digital Divide

The United States Commerce Department has been charting the Digital Divide since 1995 in a series of reports called "Falling Through the Net." The Digital Divide is a term used to describe the disparities in access to telephones, personal computers (PCs), and the Internet across certain demographic groups. For this thesis effort, the Digital Divide will refer to Internet access, only.

In 1998, the U.S. Department of Commerce Census Bureau interviewed 48,000 households distributed across the United States. At the end of 1998, 42.1% of American households owned computers up from 24.1% in 1994 and 36.6% in 1997 (an increase of 74.7% and 15.0%, respectively) as shown in Figure 2.7. Approximately 26.2% of U.S. households had Internet access up from 18.6% in 1997-an increase of 40.9% (U.S. Department of Commerce).
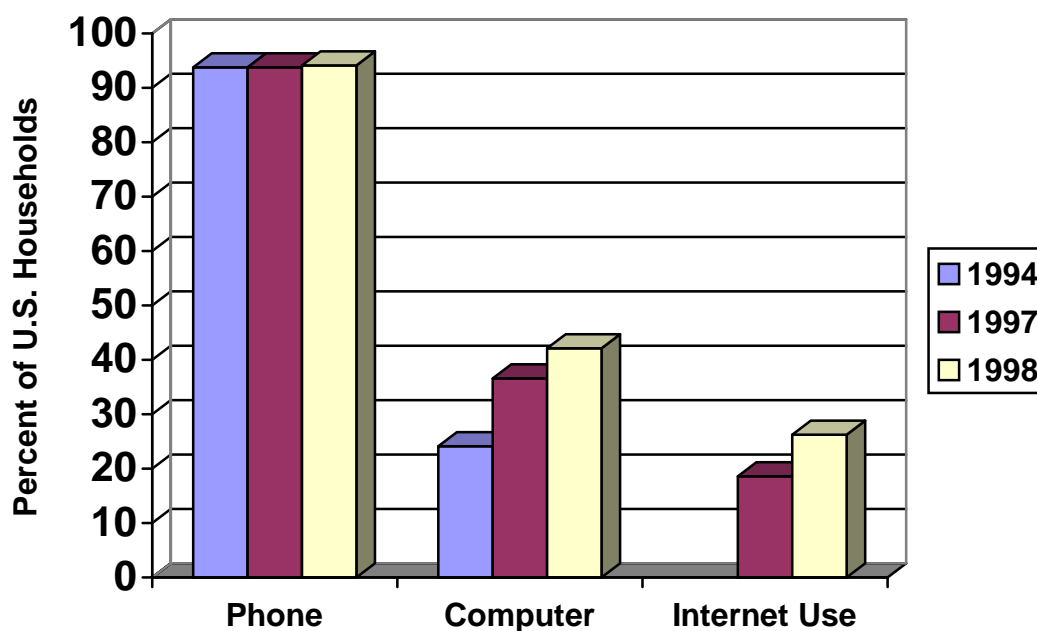
Figure 2.7 Percent of U.S. Households with a Telephone, Computer, and Internet Use 1994, 1997, 1998 (U.S. Department of Commerce 1999)

The 1998 data reveal significant disparities including that Urban households with incomes of $75,000 and higher are more than *twenty times* more likely to have access to the Internet than rural households at the lowest income levels, and more than *nine times* as likely to have a computer at home as shown in Figure 2.8. Regardless of income level, Americans living in rural areas are lagging behind in Internet access. At the lowest income levels, those in urban areas are more than twice as likely to have Internet access than those earning the same income in rural areas.
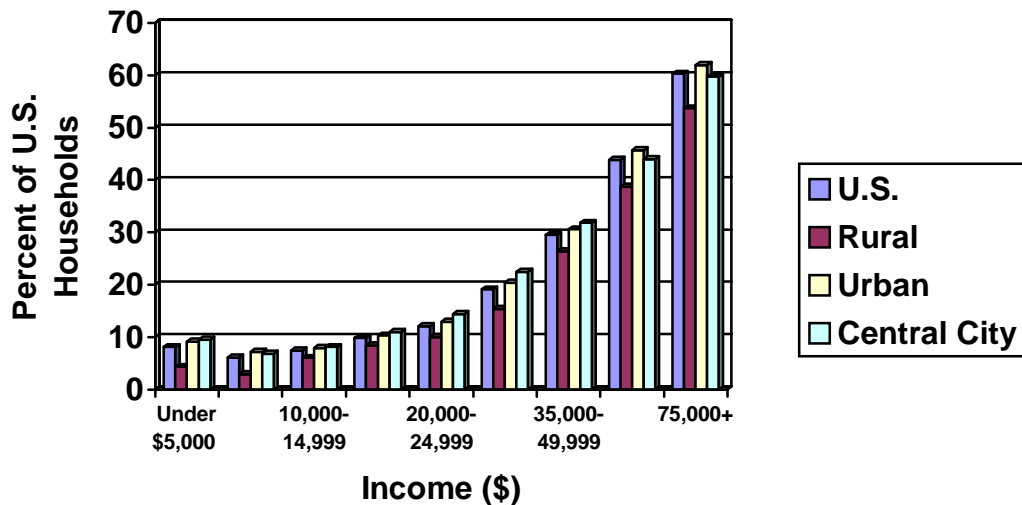
Figure 2.8 Percent of U.S. Households Using the Internet By Income, By U.S., Rural, Urban, and Central City Areas in 1998 (U.S. Department of Commerce 2000)

For Americans with incomes of $75,000 and higher, the divide between Whites and Blacks has actually narrowed considerably in the last year. This finding suggests that the most affluent American families, irrespective of race, are connecting to the Net. If prices of computers and the Internet decline further, the divide between the information "haves" and "have nots" may continue to narrow.

Community access centers (CACs)-such as schools, libraries, and other public access points- play an important role. The 1998 data demonstrate that community access centers are particularly well used by those groups who lack access at home or at work. These same groups (such as those with lower incomes and education levels, certain minorities, and the unemployed) are also using the Internet at higher rates to search for jobs or take courses. Providing public access to Internet will help these groups advance economically, as well as provide them the technical skills to compete professionally in today's digital economy.

Americans of many ages used the Internet in 1998 as shown in Figure 2.9. The largest number of Internet users was between 25-34 years (42.3%) followed by the age group of 35-44 years (39.8%) and by the age group of 45-55 years (38.7%). It should be noted that the average age of craft labor is approximately 37 years old.
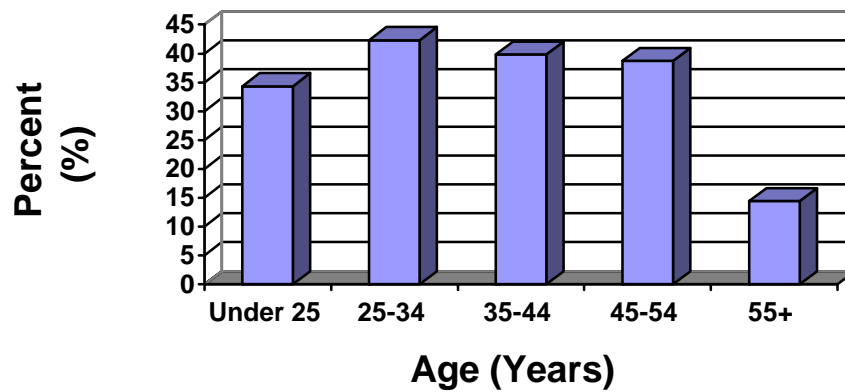
Figure 2.9   Percent of U.S. Persons Using the Internet by Age 1998
(U.S. Department of Commerce 1999)

Americans use the Internet for various reasons. E-mail is the most popular application for using the Internet at 77.9% followed by information searches (59.8%) and take courses at 36.1%, respectively as shown in Figure 2.10. Job search is used by 14.5% of U.S. people using the Internet at home. This suggests that job searches are a secondary or limited application on the Internet.

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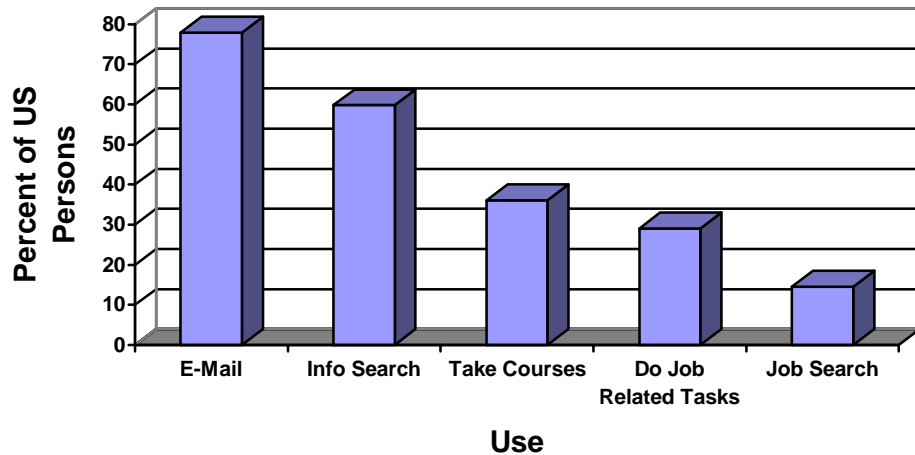
Figure 2.10 Percent of U.S. Persons Using the Internet at Home by Type of Use 1998 (U.S. Department of Commerce 1999).

2.7.2 Limited Access

In addition to the demographic challenges of the Digital Divide, technological challenges of the Internet impact all users. The principal access device continues to be the PC, which can be tricky to use, unstable, inconvenient to transport, and expensive (Brake and Lawrence 2000). Companies are addressing this problem through new potential sources including wireless, PDA and cell phones. Consumers are responding accordingly.   Based on a market study by NDP Intelect, 48% of cell phones purchased at retail during the second quarter of 2000 were Internet-ready cell phones (NDP 2000). This is a tenfold increase over the same period as last year as shown in Figure 2.11.
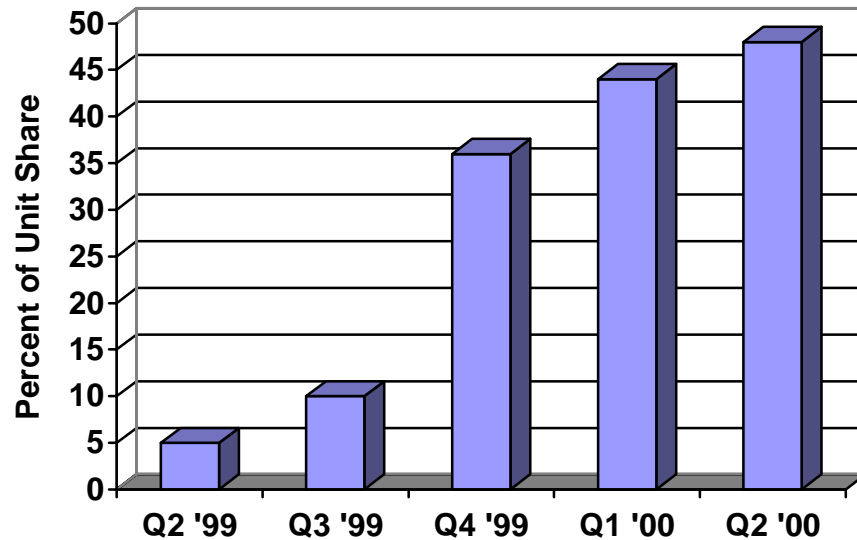
Figure 2.11 Unit Share of Internet-Ready Cellular Phones in Traditional Retail Channel (NPD 2000)

NDP Intelect reports the average selling price for Internet-ready cell phones in the second quarter of 2000 as $164 compared to $211 in the prior year. Typically, Internet-ready cell phones cost about 1/3 more than traditional non-Internet ready cell phones. Peter Arato, NPD Intelect account managaer states:

> *Cellular penetration will continue to increase to the point where the handsets are becoming commonplace. As content improves, applications will extend beyond basic sport scores, weather reports, and stock quotes. E-commerce, location-based applications, and pipeline improvements promise to keep this trend going. The big challenge will be finding user-friendly ways to enter and access information on an increasing miniaturized device. Whether that means improved displays, full keyboard, or voice-activated technology remains to be seen. Consumers have already shown an appetite for Internet applications on PCs. The big winners will be companies that figure out a way to ease access to similar applications on cellular devices (NPD 2000).*

Internet Economy companies are also addressing this challenge with free Internet access deals across major e-merchant segments: brokers, banks, retailers, travel companies, etc. In some cases, free Internet appliances (e.g., Web phones, PDAs and PCs) will also be offered. For example, Kmart agreed with Yahoo! to offer free Internet access to those who register at Bluelight.com. In addition, Wal-mart and American Online (AOL) have announced a joint effort as well but have not yet revealed Internet pricing.

2.7.3 Usage Problems

A second technological challenge with the Internet includes finding specific information reliably and efficiently. Many Internet users know the difficulty, frustration and inefficiencies of sorting through information to find applicable and useful material. Also, many companies find it difficult to integrate the Internet with their existing systems (Brake & Lawrence 2000). The main problem in using the Internet, searching the web and integrating it with existing systems is due to ability for the Internet to read and understand the originally created protocols. A new protocol, Extensible Mark-up Language or XML, describes content in terms that machines can understand. With XML, searching for information and integrating existing (data-driven) systems will become much more straightforward and streamlined than it is today. At the same time, developments in language-translation technology and speech recognition and synthesis will mean that content can be created and expressed as electronic text or spoken word in any language. Windows in the world of the Internet will look less like the windows on a computer screen and more like windows on a storefront (Brake & Lawrence 2000).

2.7.4 Flawed Infrastructure

The third technological challenge with the Internet includes problems in the infrastructure on which the network runs including insufficient bandwidth or undercapacity and lack of security (Brake & Lawrence 2000). It is anticipated that

infrastructure problems will be eliminated with implementation of new broadband telecommunication technologies including Digital Subscriber Link (DSL) and new mobile technologies by solving capacity problems on the network. DSL allows copper wires of old-fashioned fixed telecom networks to carry more than 10 times as much traffic. New mobile telecom technologies like Universal Mobile Telecommunication System (UMTS) will do the same for mobile networks, while high-capacity cable networks will offer yet another channel (Brake & Lawrence 2000).

2.8 Union Salting and the Internet

The construction industry has unique characteristics not so obvious to other industries in the United States. One of these characteristics, union salting, is controversial in nature. At this early stage of the Internet generation, it is premature to characterize the relationship between union salting and recruitment of skilled labor over the Internet. Depending upon perspective, some view that recruitment over the Internet may be used as a tool by the union sector to salt projects.

The practice of "salting" involves the hiring of a paid union member, unknowingly by a nonunion employer. The purpose of salting is to organize within the non-union organization. The main goal of salting is organizing the unorganized into union shops, in order to eliminate any perceived unfair competition based on non-union employers' wages and working conditions (Van Bourg & Moscowitz 1998). Depending on perspective, the unions view salting as only a part of the larger picture of labor-management relations. Alternatively, some non-union employers see union salting as a means to inflict financial hardship on a non-union organization. This report only presents that union salting may be an issue with Internet recruiting and this report does not address or defend the controversies surrounding this practice.

The term "salt" originates from the fraudulent practice of placing minerals such as gold in an area to make it appear that the land contains a valuable mineral deposit. It is

possible that Internet recruitment activities of skilled labor may increase salting of non-union projects by union members. Depending on perspective, this may or may not be a desirable outcome.

Although it is premature to predict the impact of the Internet union salting, it is possible that union-salting activities may increase through this recruitment channel.

Chapter 3

Survey Analysis

3.1 Respondents

The survey was mailed to 56 organizations that are affiliated with CII and/or the CCIS Workforce Advisory Committee in August 2000. Some organizations have multiple employees/contacts actively participating in CII or CCIS and each contact received a survey to improve the overall organization response rates. Surveys received by October 2000 were included in the analysis. No follow-up phone calls, e-mails, or second mailings of surveys were performed. As a condition of the survey, confidentiality of the responding participants was maintained. A total of 21 contacts responded to the survey from 18 organizations for a 32% response rate by organization. Responses from the two organizations that had multiple responses, two and three responses, respectively, were generally consistent. A database was created to store, manage, and analyze the data. Results of the survey are included in the following sections.

Participants of the survey were generally executive level managers within their organization including CEO's, managing directors, vice-presidents, human resources managers, staffing managers and project managers. The 18 organizations included owner companies, general contractors, design/project manager firms, consulting firms, unions and government organizations. The respondent distribution is summarized in Table 3.1.

Table 3.1 Survey Respondents by Organization Type

ORGANIZATION TYPE	NUMBER OF ORGANIZATIONS RESPONDING	NUMBER OF EMPLOYEES
General Contractor	9	1,000+
Owner Company	4	1,000+
Design/Project Management	1	100-500
General Contractor/ Design/Project Management	1	1,000+
Union Labor Organization	1	1,000+
Government	1	100-500
Consulting	1	Less than 10

The typical profile of the participating organizations is a general contractor with more than 1,000 employees.

3.2 Recruitment Channels in the Construction Industry

The organizations use varied channels and tools for recruitment of skilled labor and often used several different channels. Word of mouth was used by nine of the organizations as a primary or secondary channel followed by classified ads with six organizations. The union hall was the primary channel for six of the organizations. None of the 18 organizations responded that the Internet was the primary or secondary tool for recruitment of skilled labor, although it is used as shown in Figure 3.1 for professional staff. Other responses included state employment services, radio/television, internal labor databases (one response) and former employees.
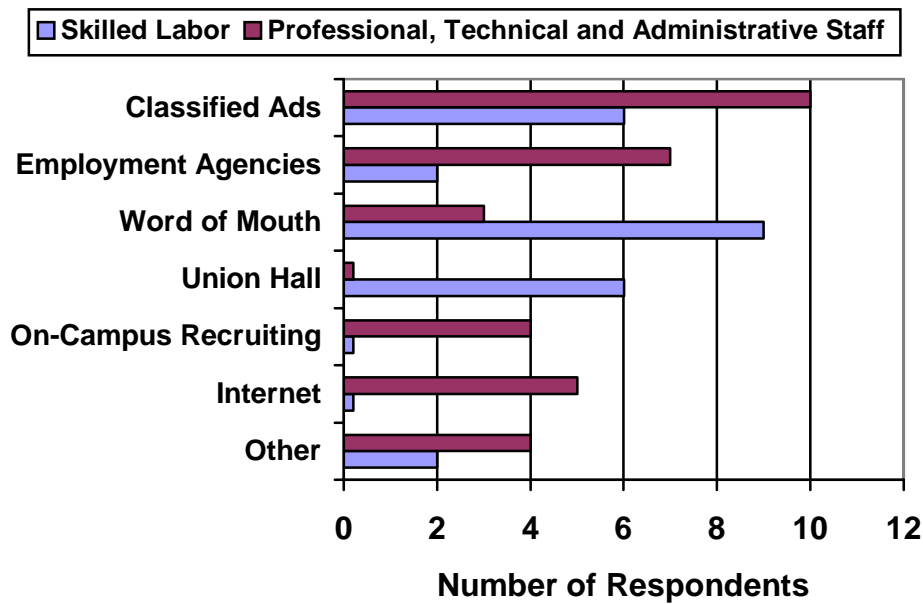
Figure 3.1 Primary and Secondary Channels for Recruitment by Labor Type

Similar to skilled labor recruitment, organizations used various recruiting tools for recruitment of professional, management and administrative staff as shown in Figure 3.1. Twelve of the responding organizations (67%) use classified ads or employment agencies/headhunters. Other channels include word of mouth, on-campus recruiting, radio/television and other referral programs. Two organizations (11%) responded that the Internet is the primary recruitment channel. Five (28%) of the responding organizations, all general contractors, use the Internet for recruitment of professional, management, and administrative staff as a primary or secondary channel.

3.3 The Internet and Recruitment

Seventeen (94%) of the organizations have a corporate web site and one organization did not respond to the question. Responses to the question "How long has your company been using the Internet for recruiting?" ranged from between zero and three years with six companies responding that they do not use the Internet for recruiting

as presented in Figure 3.2. Thirteen (72%) have a recruiting web page indicating they use the Internet for recruiting. This corresponds to the 1999 FMI report that reported 72% of construction companies use the Internet for recruiting (FMI 1999).
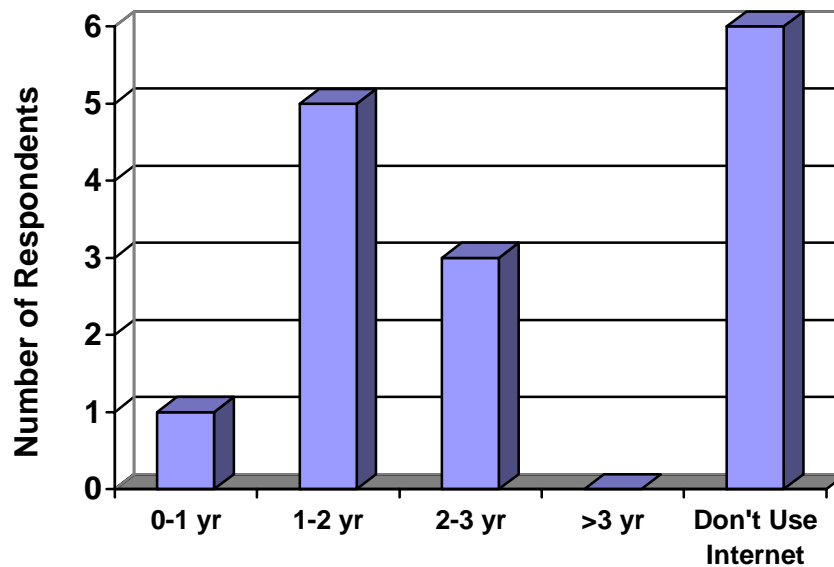
Figure 3.2 Number of Respondents to "How long has your company been using the Internet for recruiting?"

Five organizations (28%) responded that they post skilled labor jobs on-line with four of those posting on their companies web site as shown in Figure 3.3. One organization (6%) responded that they search on-line for skilled labor. A total of 11 organizations (61%) responded that they post professional, management and administrative staff on-line with all eleven posting on their companies web site. In addition to the company website, six post at other on-line recruiting sites, two post at trade organization web sites and one on campus websites. Seven organizations (39%) responded that they search on-line for professional, management and administrative staff.
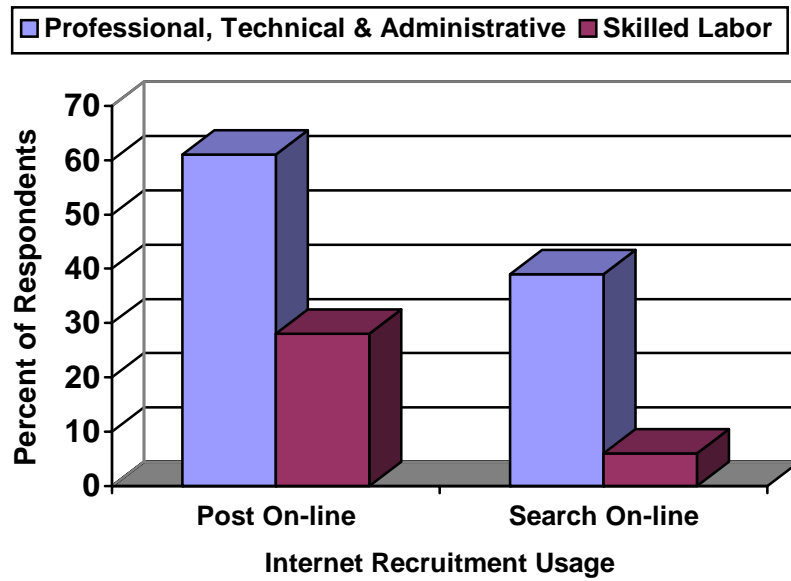
Figure 3.3 Internet Recruitment Usage by Labor Type

Two organizations-both general contractors-hired between 1-10 skilled labor staff using the Internet in the last six months as shown in Figure 3.4. Two organizations-both general contractors-hired between 21-50 skilled labor staff within the last six months using the Internet. Five organizations reported they hired between 1-10 professional, management, and administrative staff within the last six months, one between 21-50 staff and two with more than 100+ staff on the Internet, respectively.
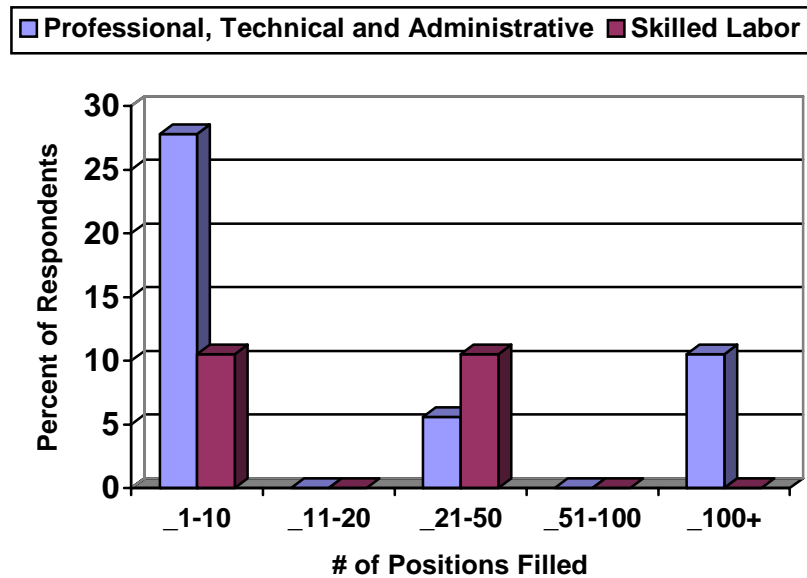
Figure 3.4 Number of Positions Filled Using the Internet by Job Type

Fifteen organizations (83%) plan to use the Internet more frequently in the future. Four organizations report that they develop a budget for using the Internet for recruiting with two responses between $10,000-$100,000 per year and one response between $1,000-$10,000 per year. Six organizations (33%) plan to increase the budget next year. None of the organizations have quantified any savings in cost, schedule and/or quality by using the Internet as a recruitment tool. Twelve organizations (67%) use the website as a marketing tool to recruit new employees and one organization uses the Internet in the recruitment process for background checks and approvals.

The organizations responded that the greatest benefit for using the Internet, as a recruiting tool was the increased audience reach followed by convenience as shown in Figure 3.5. Reduced cost, reduced time and improved communication had three, two and one responses, respectively. It should be noted that five organizations provided multiple responses to this question and two organizations provided no response. For increased

audience reach, the survey did not distinguish between a broader geographical reach vs. more intensive reach within a geographic area.
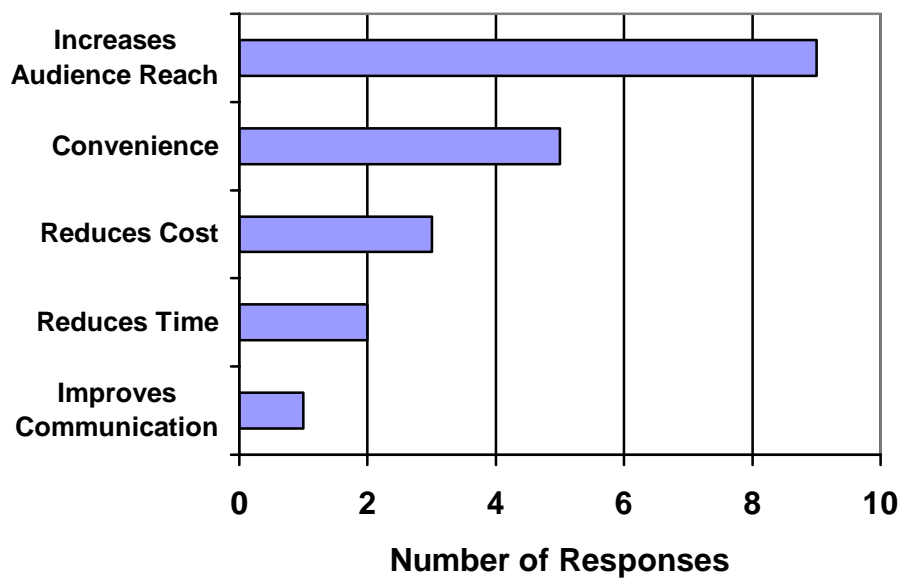
Figure 3.5 Number of Respondents to "What do you see as the greatest benefit for using the Internet as a recruiting tool?"

3.4 Internet as a Valuable Recruitment Channel

Fifteen (83%) of the responding organizations indicated that the Internet is a valuable tool for recruitment of professional, technical, and administrative staff. Eight (44%) of the responding organizations indicated that the Internet is a valuable tool for recruitment of skilled labor as shown in Figure 3.6.
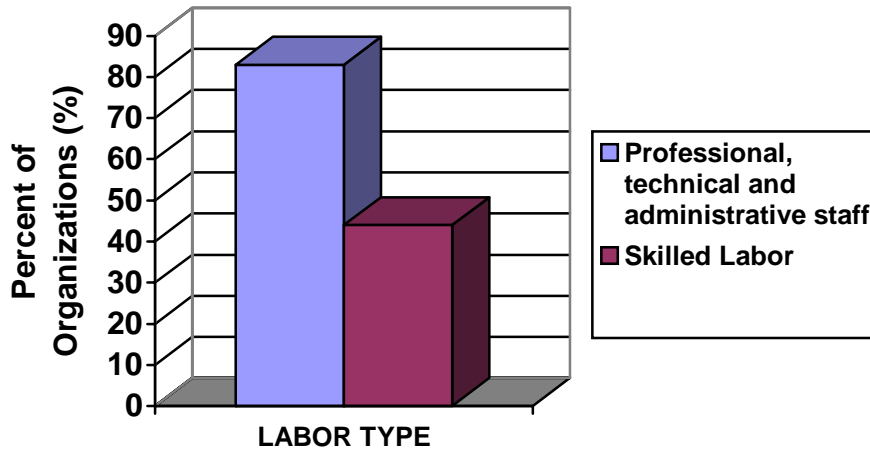
Figure 3.6   **Percent of Organizations That View the Internet as a Valuable Tool for Recruitment by Labor Type**

3.5 Improvements In the Internet

Organizations responded with a wide variety of improvements in the Internet with improvements in on-line recruiting sites as a dominant and recurring improvement. Organizations responded that they want more construction related job web sites that are specific to the construction industry and easy to locate in a search. Based on the responses, it appears that employers may experience frustration in locating job-recruiting sites that meet their needs. This may be due to the lack of existing sites or the inability to locate the sites during a search. It may also indicate that the existing Internet recruiting sites used by the construction industry are insufficient or inadequate for listing job applicants.

One response indicated that an improvement in the Internet would be less costs and better training. The response may be referring to infrastructure, hardware, software, Internet service provider fees and web hosting costs. Better training is interpreted that

construction recruiters using the Internet want specific Internet training to enhance their job performance. An improvement in the Internet from one respondent included more craft labor using the Internet. This may suggest that craft labor is not accessing and using the Internet or the perception by construction industry executives is that craft labor is not using the Internet. A response included keeping job postings accurate and updated indicating that job postings are inaccurate and not current. Finally, one response for the Internet was to increase passive recruiting effectiveness indicating, perhaps, that the construction industry is not exploiting the potential of the Internet in terms of the leverage of passive recruiting.

Organizations responded there are a wide variety of obstacles in using the Internet as a recruitment tool. No recurring or dominating responses were identified, however. The obstacles included attitude within the organization, usage limitations of the Internet, lack of IT skills, constraints on time and staff and limited computer and Internet access by the skilled craft labor.

Chapter 4

Best Practices For the Construction Industry

The Internet can be an effective tool in the recruiting process in the construction industry. Although construction companies should recognize that Internet recruiting is a tool and not a solution or silver bullet for recruitment problems. With the growth and hype of the Internet, many firms are promoting and selling Internet-based services to construction companies and construction job seekers. Construction companies and organizations need to assess and determine the level of need for Internet recruiting compatible with their own corporate strategy.

An advantage of Internet recruitment is that it is scalable and applicable to many diverse industries and organizations that have recruitment needs including the construction industry. The paradoxical beauty of the Internet is that the Internet can be described as a broad and general communication and collaboration tool for use by many yet, at the same time is specific and focused, to address the information needs of a select audience. The core functional elements of an Internet recruitment program do not discriminate between industries, organizations or labor type but are common across these markets.

The differences between Internet recruitment programs are essentially nothing more than selected unique features of a tailored program that target a specific recruitment need. The functional elements are common to Internet recruitment programs yet the selected features are customized. Every industry has unique characteristics that define itself but all common to recruit employees.

4.1 Typical Internet Recruiting Model for the Construction Industry

Several different models exist for Internet recruiting and are individually tailored to construction organizations recruitment needs. This section provides a typical Internet recruiting model for the construction industry. The beauty of the model is that it is applicable to the following construction organizations:

- Direct hire of skilled labor by general contractors, owner companies, government organizations, design/project management firms and other construction organizations that hire skilled labor
- Subcontractors that hire skilled labor
- Unions
- Temporary recruiting agencies

The Internet recruiting model is scalable such that it is applicable for both small and large organizations that hire skilled labor.

Construction organizations use Web sites as an anchor for their Internet recruiting strategies rather than as just an additional channel for advertising job openings. Recruitsoft.com/iLogos Research has identified several Best Practices in Internet Recruiting and has presented a typical business model as shown in Figure 4.1.

```
┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│ Attract Potential│    │   Meet Their    │    │  Simplify the   │    │ Streamline the  │
│ Skilled Labor to │ →  │   Information   │ →  │  Application    │ →  │ Processing of   │
│    Web Site      │    │      Needs      │    │    Process      │    │  Applications   │
└─────────────────┘     └─────────────────┘     └─────────────────┘     └─────────────────┘
```
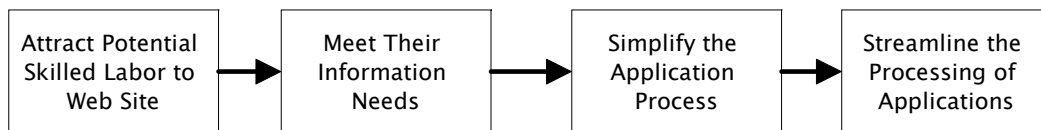
Figure 4.1 Typical Internet Recruiting Model (recruitsoft.com 2000)

The model consists of four main functions and the following description has been tailored to specifically address the construction industry. The first function is to attract skilled labor to a corporate, organization or job web site. Construction organizations use several techniques and methods to attract skilled labor to corporate web sites. Newspaper advertisements placed by organizations will advertise to readers that an organization is looking for new skilled labor and they will include a web address. Often, the organization will provide limited information about the job description but will encourage the applicant to visit the web site for additional detailed information. With the job descriptions on-line, a brief reference to them reduces the amount of advertising space required and directly reduces the newspaper advertising costs (E-cruiter.com 2000). Essentially, the newpaper medium becomes an advertising channel and refers the applicant to the corporate web site for information.

Other advertising mediums used by construction companies to promote web traffic include billboards, television and radio announcements, job fairs, movie theaters, sporting events, concerts, airports and other venues to target and reach potential applicants.

On-line career boards like Monster.com, attract large numbers of visitors each day. On-line career boards typically charge companies a fee for posting a position and/or an annual corporate subscription based on number of postings and various fee schedules. Candidates usually post without incurring any fees. Construction companies often use on-line career boards as a supplement to their own organization Web page to generate interest and traffic with hot links back to the organizations Web page.

Another option for attracting applicants to construction organizations Web site includes advertising banners placed on strategic web sites frequented by the target audience. The advertising banners encourage applicants to visit the employment section of the organizations web site. Also, organizations index the employment page of their

web site with major search engines to generate traffic. Potential applicants use search engines to locate jobs and gather information.

The second function in the business model is to meet the applicant's information needs. Web sites have an employment/career center link that provides a job description, job location and how to apply including proper channels for submitting job applications and resumes. The employment site can be a powerful tool for construction organizations to promote themselves by providing information on the benefits package, highlighting advantages over competitors, and describing the organizations culture and environment.

Some construction organizations have implemented internal sites via an intranet as a technique of providing employees with access to internal job postings and other relevant career development information. This strategy protects existing human resources and supports mobility with the organization as an overall employee retention strategy (E-recruiter.com 1999).

The third function in the business model is to simplify the application process to make it easy for the applicant to apply and for the company to manage the information. The employment page may have a search engine that allows the applicant to search for a particular position by location, area of expertise or by department. An on-line resume builder simplifies the process for the applicant to provide the necessary information and allows the company on the receiving end to sort the entered fields. Some companies advertise a partnering program on the employment site. The partnering program provides an interface between an applicant and an insider to assist and provide information during the application process. Finally, some companies provide an e-mail notification service, similar to a newsletter that sends out job openings/positions to a target applicant/audience. This is a strategy used to attract passive job seekers currently employed.

The fourth function in the business model for the construction industry is to streamline the processing of applications with tracking systems and hiring management

systems. Software applications used by the Human Resource Department assist in job posting capabilities, applicant tracking and processing, resume management, administration and security and applicant workflow applications (ecruiter.com 1999). The goal of an efficient business model is to reduce the workload of the Human Resource Department and not increase it. Some features of software applications automate job posting on the corporate web site, selected career boards, newsgroups and other key sites. The software application accepts resumes by e-mail or through a resume builder, inputs new resumes into the recruitment database, sends out acknowledgement of receipt of application by email, searches resumes by keywords or concepts, undertakes the initial screening of resumes and prepares resumes that can be easily formatted to line managers, matches skill sets, access to applicant database (recruitsoft.com/iLogos Research 1998).

Some companies and web sites package automation and integration services that optimize the job board, assessing competency with on-line tests, finding candidates, writing ads, doing background screening, and even negotiating the offer and doing the closing (Meade 2000). In addition, automation and integration may include access to workforce services, immigration services, background checking & relocation services, salary data and regulatory information. The available features are numerous and will directly impact the cost of the Internet recruitment program. It is important for construction organizations to develop specific goals and objectives that meet their organizations needs. The suggested business model is based on the four functional elements that are applicable to all construction organizations. Additional features can be tailored to an individual organizations needs on a case-by-case basis according to goals, objectives, needs and available budget.

4.2 Factors to Consider with an Internet Recruitment Program

As construction organizations determine the scope, nature and extent of their Internet recruitment program that fits their size, needs and budget. There are several factors and features to consider and evaluate including:

- Cost of hosting and maintaining a web site or using an application service provider
- Staffing and training of personnel on Internet recruitment
- Level of depth for integrating the online recruiting strategy
- Applicant tracking and hiring management systems
- Effectively addressing active and passive job seekers
- Security
- Reliability
- Redundancy/backup servers
- Scalability
- Measuring success
- Return on investment

An effective Internet recruitment program is planned and designed well and its success is driven by an organizations commitment to implement the program.

4.3 Benefits to Skilled Labor

Based on the research effort, the benefits to skilled labor for using the Internet are several. Skilled labor is able to search a larger pool of job openings and positions using the Internet including an expanded geographic reach both on a local, regional and national level. The Internet is a valuable benefit to skilled labor for providing job information, company information, salary surveys and company benefits that can be used in the job search and decision-making process. In addition, the Internet simplifies the job application process for skilled labor with electronic job application forms and resume submittals that can be completed from any location with Internet access. The job applicant can apply for a position during non-business working hours. This is valuable to

those employed or near the end of a project and that can't afford to miss a day's wage. Finally, the Internet reduces the length of time required in the job application process and increases the speed to hire for skilled labor. It also can provide for a smooth transition between projects and can reduce the lost time between old and new projects. Essentially, with healthy demand the Internet may help skilled labor stay employed by reducing the down time between projects.

Based on the discussion that the Internet may help skilled labor stay employed by reducing the down time between projects in a market, it would be reasonable to suggest that total annual income for skilled labor would increase. This is the result of more hours worked on an annual basis due to less down time between projects. Of course this assumption based during periods of strong economic market conditions and strong demand for skilled labor similar to the conditions of the late 1990's and early 2000's.

It is not expected that the Internet will increase or decrease labor wage rates. A primary driver for labor wage rates is based on the economics of supply and demand that are significantly influenced by interest rates, inflation, and the general economic conditions of the market. The Internet is not increasing the supply or demand for skilled labor, but rather, may reduce the inefficiencies of the labor market. The labor market is not as efficient as other commodity-based markets or financial markets. The Internet reduces the lag time of the inefficiencies by providing more available information to a larger audience. The Internet is a communication and collaboration channel, an information highway that links the supply and demand groups in a timely and efficient manner.

Chapter 5

Conclusions and Recommendations

5.1 Conclusions

Based on the results of the literature review and survey of construction industry organizations, the following are the conclusions of the research:

- Recruiting using the Internet is growing and the construction industry has been slow to adapt relative to other industries.
- The construction industry uses the Internet for recruitment of professional, technical and administrative staff.
- The Internet is under utilized for recruitment of skilled labor mainly due to the perceptions and attitudes of construction organizations towards skilled labor.
- The Internet appears to be a potentially useful tool for recruitment of skilled labor.

5.2   Future Research

The results of this research are promising and have revealed new areas in need of additional research including:

- A comprehensive survey of the use of the Internet by craft workers.
- Understanding the lag in the construction industry with Internet recruitment and in particular the gap in its use between professional, technical and administrative staff and skilled labor.
- Measures and quantification of the potential benefits of Internet recruiting in terms of cost, schedule, quality of hires and productivity.

- Develop an implementation guide for use in Internet recruiting by the construction industry.

5.3 Recommendations

The author recommends that construction organizations consider Internet recruitment trends and Digital Divide trends when considering implementation of an Internet recruiting program.

- Construction organizations use Internet based recruiting for professional, technical and administrative staff and could easily expand existing programs to include skilled labor.
- Construction organizations should explore the potential benefits of Internet based recruiting and leverage the benefits to obtain a competitive advantage for recruiting skilled labor.
- Construction companies and organizations should assess and determine the level of need for Internet recruiting compatible with their own corporate strategy.
- An Internet recruiting program for direct hires of skilled labor by general contractors, owner companies, government organizations, design/project management firms, subcontractors, unions and temporary recruiting agencies should consist of an Internet recruiting model that consists of the following four functions:
    1. Attract potential skilled labor to web site
    2. Meet their information needs
    3. Simplify the application process
    4. Streamline the processing of applications

- An effective Internet recruitment program is planned and designed well, and its success is driven by an organization's commitment to implement the program.

APPENDIX A

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