A dvances in technology have had a profound impact on the business practices of many organization functions including financial systems, sales, marketing and produc-

Expanding the Search for Talent: Adopting Technology-Based Strategies for Campus Recruiting and Selection [1]

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Abstract

Organizations are rapidly introducing new technology to the practice of campus recruiting and selection. The reasons driving this change are first discussed. A cross-section of technologies such as video-conferencing, computer-aided and computer-based interviewing, and recruiting on the Internet, are described and research related to the effectiveness of these technologies in campus recruiting are reviewed. The major conclusion of the article is that there is a pressing need for empirical research to evaluate these new technologies to establish their effectiveness for selection and recruiting.

tion. One area that has remained decidedly low-tech has been the practice of human resources. Traditionally, the requirements for conducting an interview were a quiet room, a few chairs, a sharpened pencil and a nervous applicant. More recently however, our low-tech interview has been replaced by interviews embellished by many types of high-tech gadgets from laptops packed with software for scoring applicants' answers, to videoconference-based conversations taking place on the Internet (although the nervous applicant continues to play a considerable role). The subject of this paper is to explore the forces behind the use of technology in recruiting and selection, to describe emerging technology-based interviewing practices, and to examine potential opportunities and drawbacks of

using advanced technologies in campus recruiting and selection.

Why Changes Are Happening

There are several factors that contribute to the increased use of technology for selection and recruiting. Most of these factors are financial in nature, but other forces are also at work.

Globalization

Hiring locally is rapidly becoming a thing of the past. To succeed in a competitive global marketplace, businesses are looking for the best and brightest employees, regardless of their geographical setting. Shortages of highly skilled workers in areas such as computer science and engineering, have created a huge demand for international recruiting (Laabs, 1998). However, searching the international marketplace for human capital is not for the weak of wallet. Interviewing applicants from St. Petersburg for a computer programming position or finding a systems analyst in Tokyo creates a large up-front expense. Many organizations are discouraged by the costs involved, others are forced to pay rather than risk losing business as a result of a shortage of skilled workers. Later in this paper, I will review technologies that many HR practitioners hope will reduce these costs.

Handling the Volume

Even in tight labor markets there are increasing requirements to track and sort potential candidates. Job advertisements for attractive positions can still generate hundreds of applicants, and it is then a daunting

task for HR personnel to sift through the forests of resumes to find suitable candidates. We have all read the accounts of harried managers tossing out resumes for trivial reasons such as paper quality, typos or unusual formats, just to pare down the number of resumes to a reasonable count. While some might justify this practice by arguing that the resume is a sample of the work the candidate can do, most concede that other factors such as access to professional resume writers, computer programs, and job search courses are just as likely to account for the differences in resume quality. We can no longer afford to miss a good candidate on the basis of their choice of resume paper. Thus the second factor that is highlighting the need for increased use of technology in HR is the need to systematically handle large volumes of applicants without inadvertently screening out good prospects.

Making an Impression

Companies are loathe to admit that they are not on the cutting edge of technological innovation. To attract and retain the best employees, companies need to invest in technologies that make the candidate feel that the company is innovative and has a bright future. The selection and recruiting process is an opportunity for organizations to demonstrate their adoption of advanced technologies and thereby attract applicants who like the bells and whistles afforded by the latest technology. Showing the candidates that you can afford the latest technological wizardry tells them that your organization is perhaps a stable and interesting place to work.

Using What You Have

The premise that one must use what one has bought is also a factor driving the use of technology in recruiting and selection. The wide-eyed information systems administrator who has sunk a small fortune into an Intranet system has a vested interest in persuading the HR Director to take advantage of HR applications that run on their expensive infrastructure. HR directors, eager to demonstrate their vision of the future HR department, are likely to adopt the latest technology as a strategy to enhance the functioning of their departments.

Interconnections with Other Functions

Organizations are increasingly becoming aware of the benefits of integrating the information from various parts of the organization to enhance their operations. A considerable amount of useful information is generated by HR processes that can be integrated into the greater technological body of the organization. Information from organizational analyses, job analyses and competency models can identify skill gaps in the organization and drive the hiring process. Information from potential candidates can also be used to design future recruiting processes. Selection information on individual candidates can be passed on to training and development to make sure training is provided only to those who need it. Adopting technologies for recruiting and selection can help create a seamless flow of information to decision makers about their most valuable resource — people.

There are, of course, many other factors that could be contributing to the use of technology in selection and recruitment. It is beyond the scope of this article to provide an exhaustive list and instead I have endeavored to provide the reader with a few of the most prevalent sources of increasing technology use in HR. The next section will discuss some of the specific technology practices that are being adopted in the HR field, and are becoming more common in campus placement centers.

New and Emerging Technology Practices

A variety of technologies are currently used to assist with the campus recruiting and selection process. Other emerging technologies and practices may have potential benefits for campus recruiters. This section will discuss some of these technologies and how they are being used on campuses.

Videoconference Systems

One of the most promising technologies being used for campus recruiting and selection is the videoconference system. Videoconference technology transmits interactive video, sound and data between two or more geographical areas. Many systems are connected with telephone lines, special

dedicated data lines, or modified cable systems which can transmit data fast enough to reduce or eliminate video lag. These systems vary in price and complexity, from desktop computer versions to conference rooms and classrooms. Most universities have some form of videoconference facility, and most large and medium sized companies have access to these systems. A growing industry has evolved around renting time on a system to organizations that do not have their own.

The most frequent use of these systems for selection purposes is for conducting employment/ recruiting interviews with university applicants. Imagine the potential of interviewing five applicants at five different universities without ever having to leave your desk. Benefits for the organization include cost savings, access to more and better applicants, and the opportunity to display technological prowess. Of these benefits, perhaps most attractive is the large cost savings realized by using the technology. The average cost of interviewing candidates face-to-face has been estimated to be $1700 per candidate (Cummings, 1993). This cost includes transportation, hotels, meals and other expenses associated with placing a recruiter on campus. This cost is contrasted with an expenditure of $50 to $250 for a half-hour interview by video-conference (Cummings, 1993). These potential savings have led some large organizations, such as Procter & Gamble, to invest in videoconference technologies for campus recruiting in the United States.

Computer-aided Interviews

There is considerable potential for using laptop computers or notepads as aids for conducting employment interviews. In an effort to increase the reliability and predictive validity of employment interviews, many interview theorists have advocated the use of highly structured interviews (e.g., Campion, Pursell & Brown, 1988). These standardized interviews typically involve asking each applicant the same job-related questions, and scoring each of the applicant's responses according to a scale developed prior to the selection process (for a detailed discussion of structured interviews,

see Campion, Palmer & Campion, 1997). It is possible to have the interview questions and the rating scale for each question stored on the computer, making available information that can prompt the interviewer to ask a question while allowing the interviewer to rate the applicant on a variety of dimensions for each response. These ratings could be quickly and automatically tallied by the computer at the end of the interview to generate a composite score, a profile or even graphs of applicant's strengths and weaknesses. This information could then be easily compared to other applicants applying for the same job, and could therefore be used to identify the best candidates for the job.

Computers can also be used to generate work sample tests. Work samples involve having the applicant perform a task that simulates some of the duties performed on the job. At Waterloo for example, it is not unusual to see interviewers (using laptops) asking computer science applicants to identify problems with a segment of computer code or to show candidates a software application and ask them how it could be improved.

Another form of work sample test that can be readily adopted for use on a computer is the in-basket test. Applicants have traditionally performed these tests on paper, involving responding to various memos and survey data, and creating action plans and memos for hypothetical subordinates, supervisors and often, members of a larger community. In addition to the reduced costs and improved legibility of the responses made by the candidates, sophisticated systems could be developed to monitor both the processes and the output of the candidate's work.

Computer-based Interviews

In addition to being used as aids in an interview setting, computers can be programmed to actually conduct interviews (Janz & Mooney, 1999). Applicants can be seated at a specially designated PC or be linked to a company website via the Internet. The computer then generates either text or audio/voice questions which the applicant responds to using a keyboard, or alternatively, with verbal responses. The content of these responses

are subsequently screened and scored by the computer or they can be coded and scored by trained HR practitioners.

Screening Resumes and Application Forms

Reading and evaluating large volumes of resumes and application forms is a daunting task. In order to cope with these tasks, many employers are asking applicants to e-mail their resumes or fill out standardized application forms on their web site. Application forms can then be screened by computers using criteria established by the hiring organization. Similarly, resumes can be screened for keywords, and a short list of candidates can be generated for further scrutiny by responsible managers. A host of computer programs have been designed to assist with this process.

Recruiting Through the Web

The World Wide Web represents an enormous resource for both applicants and employers alike. In 1997 an estimated 1.2 million jobs were posted on-line (Frost, 1997). In addition, a survey of executives reported in *Fortune* indicated that in 1998, 37% of companies used the Internet as a recruiting source; this is up from 26% the previous year (Martin, 1998). Universities such as the University of Waterloo, have been working on a system to place all of the cooperative education positions, companies and applicants on-line.

Applicants can search the web for information about the company, its history, culture, products and services, and even view profiles of current employees. This information is very helpful in having applicants identify whether they feel their own background, skills and attitudes match with the attributes of the organization. This concept of Person-Organization (P-O) fit has been extensively researched; the benefits of establishing P-O fit include reduced turnover, higher job satisfaction, and enhanced productivity (Turban, 1998).

Viewing information on the web enables potential applicants to self-screen before they become part of the applicant pool. This can save considerable time and resources for the organization and allow students to make informed choices about

potential employers.

Most organizations are aware that potential applicants visit their websites to obtain information about them. Many invest in impressive sites that contain comprehensive information for potential applicants. For example, McKinsey & Company, Booz Allen & Hamilton and other consulting firms provide profiles of new consultants, have junior consultants write descriptions of a typical working day, and give detailed information about the history and practices of the firm. This information allows potential consultants to determine their P-O fit.

Consequences of Adopting Various Technology Practices

Despite the widespread adoption and development of tools to assist in the recruitment and selection of university students, we know surprisingly little about how the use of these technologies affects the selection process. We also know very little about how students react to using these technologies. In this final section, I will review some of the literature examining how candidates and interviewers perceive these technologies.

Videoconference-based Interviews

We know from the communications literature that videoconference systems can change the way we interact with one another. Several studies have examined the impact of videoconference technology on the surface structure of conversations (e.g. Sellen, 1995). Surface structure includes behaviors such as turn-taking, floor holding, and length of speech. We know for example, that when we converse using videoconference technology, we generally have less turn-taking, and longer floor holding. This is largely due to the problems associated with cutting speakers off at the other end of the conversation. We also know that these technologies can affect the ability to perceive non-verbal behaviors, as it restricts our ability to detect eye-contact, posture and subtle facial expressions (Webster, 1997).

Studies of applicant and interviewer perceptions of videoconference technology have provided some interesting results. Research by Kroeck and

Magnusen (1997) suggests that having a campus videoconference facility available for interviews expands the number of employers who are willing to conduct interviews at Florida International University. They report that approximately 80% of the companies using their videoconference facilities would not have physically traveled to the site to conduct their interviews.

Chapman and Rowe (1997) reported that 76% of interviewers who tried videoconference based interviews preferred conducting their interviews face-to-face in order to enhance "personal contact" with the applicant. However, they also found that 88% of these same interviewers would use the technology to conduct interviews in the future. The most frequent reason given was convenience: savings in time, travel and expenses (41%). Several interviewers (16%) indicated that they believed the use of videoconference technology should be limited to student hires, initial screening of applicants, or at schools where there were only a few applicants. These interviewers often noted that face-to-face interviews could be conducted later after an initial screening was conducted with the videoconference technology.

Chapman and Rowe (1997) also examined whether the use of videoconference technology influenced the interviewers evaluations of their applicants. In a randomized field experiment, they found that, surprisingly, interviewers rated applicants higher when the interview was conducted with a videoconference system. One possible explanation for this unusual finding was examined in two laboratory studies by Chapman & Webster (1999). They found evidence to suggest that interviewers may perceive the candidate as being somehow disadvantaged by the use of the technology, and consequently adjust their ratings to account for this disadvantage. The correction however, exceeds any real disadvantage (or there may be no disadvantage), resulting in inflated applicant ratings. It is apparent that applicants should not worry about being disadvantaged by having an interview conducted by videoconference as they may, in fact, benefit from this arrangement.

Chapman and Rowe (1998) investigated whether videoconference-based interviews affects applicant attraction to organizations. They showed that applicants were more attracted to organizations who conducted their interviews face-to-face rather than by videoconference. However, this was only found for organizations using unstructured interviews where friendly informal exchanges could be constrained by the technology. For interviewers using highly structured interviews, applicants were found to be more attracted to the company when they used a videoconference system. This might suggest that applicants are more intimidated by structured interviews conducted face-to-face, than when the social barrier of the electronic medium was present (Chapman & Rowe, 1998).

Computer-aided and Computer-based Interviews

As we know far less about the use of computers as aids in the interview, this area is open for empirical investigation. For example, we do not know how applicants react to interviewers who read questions from a laptop computer or type responses during the interview. We also do not know if using computer aids will actually improve interviews. More work is clearly needed in this area.

We also know very little about computer-based interviews in campus selection. There are a handful of studies that examine computer-based interviews in clinical practice (see Lowman & Norkus, 1987), but it is obvious that there are considerable differences between screening patients for psychological disorders and selecting non-clinical populations for jobs.

Janz and Mooney (1999) reported the results of an exploratory project designed to conduct behavior-based employment interviews with personal computers. They found several problems with the applicant's ability to use the technology in that the interviews took too long, particularly for "two-finger" typists. This resulted in high drop-out rates among their applicants.

Recruiting Through the Web

Recently, there has been a considerable amount of press devoted to the topic of Internet recruiting (Crispin & Mehler, 1997; Click, 1997; Frost, 1997;

Doran, 1998; Gray, 1998; Welch, 1998). Despite this attention, there have been few empirical studies examining how effective the Internet is for generating applicants and how using the Internet affects how candidates rate the attractiveness of an organization. Concerns also arise regarding the potential for Internet recruiting to exclude large segments of society, namely those who cannot afford Internet access (King, 1997). These individuals might be excluded from competitions for attractive positions. From a legal standpoint, this could result in an adverse impact for protected groups.

Conclusions

It is unmistakable that technology will play an increasingly central role in the recruiting and selection processes on campuses and in the larger employment context. Adopting technology-based strategies for recruiting and selection creates potential gains for all stakeholders in the campus recruiting/selection process. Employers are able to expand their applicant pools to larger numbers of schools including smaller schools that were too costly to visit in the past. The logistical problems of transporting interviewers to campuses, finding accommodations and finding interview rooms are eliminated or substantially reduced with greater technology use. Adopting technology-based strategies also has potential for helping the employer make better decisions on more objective data. This can ultimately impact the bottom line through productivity gains associated with better selection practices.

Students can also gain from the use of technology in the campus recruiting/selection system. They can gain increased access to employers with the use of videoconference and web-based technologies. This is evident from Kroeck and Magnusen's (1997) findings where 80% of the interviewers using videoconference technology would not have interviewed at their campus without it. Students will also be in a position to make more informed decisions as a result of seeking information on the Internet about their potential employers.

Universities also stand to gain from the use of technology in the selection process. Technology has the potential to reduce the physical infrastructure required to accommodate large numbers of interviews on campus. Automated web-based systems such as the one being developed at the University of Waterloo could help reduce the amount of co-op resources directed to the logistics of running large numbers of interviews. It could also permit resources to be allocated to other co-op needs such as finding employers and preparing students for job searches. Of course, increasing the number of employers who have access to their students also has a corresponding influence on the attractiveness of the university, thereby facilitating the attraction of better students.

Although the potential gains for all parties are attractive, empirical research is greatly needed to provide a better understanding of the role of technology in the recruiting and selection process and provide guidance to practitioners who are designing and implementing systems for their organizations.

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