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## Abstract

Global business environments have become increasingly competitive. Consequently, businesses are seeking newer methods to improve efficiency, reduce costs, market new products faster, and retain customers for the long haul. One of the methods that has emerged to aid businesses accomplish all these goals is computer-mediated communication (CMC) applications. Computer-mediated communication applications in employment interviewing have received some attention from businesses since the emergence of the Internet. Existing technology makes it feasible for employers to screen and interview prospective employees without these applicants leaving their homes globally. Current trends suggest that electronic recruiting will constitute a significant portion of human resource management activity in the future. This paper discusses (1) the employment interview and its role in virtual recruiting, (2) virtual interviewing within the framework of computer-mediated communication (CMC), (3) organizational applications of virtual recruiting systems, (4) virtual organizational communication and how its attributes lend themselves to implementing virtual interviewing in organizations, (5) the relationship between virtual organizational communication and virtual recruitment , (6) Internet-basd interviewing in the context of transaction economics, (7) whether or not virtual interviews will replace traditional interviews, and (8) managerial implications of virtual recruitment and interviewing in organizations. This paper concludes by proposing areas for further research.

## 1. Introduction

Global business environments have become increasingly competitive. Consequently, businesses are seeking newer methods to improve efficiency, reduce costs, market new products faster, and retain customers for the long haul. One of the methods that has emerged to aid businesses accomplish all these goals is technology-based applications such as computer-mediated communication (CMC), multimedia, and the Internet, among many other indications.

The dynamic business environment in which companies operate also requires efficient allocation of resources among the various functions that a company must perform to remain competitive. Therefore, companies must decide which of their core functions they need to maintain in-house, and which ones they need to outsource. As fast-growing start-up companies or even the well-established ones engage in the task of episodic recruiting to meet their expansion goals or simply to fill vacancies due to staff turnover, some have turned to "virtual recruitment" [25] as a means of curtailing recruitment expenditures of their human resource departments.

Virtual recruitment allows companies to outsource the search and selection of quality candidates without having to hire more permanent human resource staff, or increase spending for one of a company's non-core activities, the employee recruitment process. According to the International Association of Corporate and Professional Recruitment (IACPR), it takes, on the average, about 4.13 months, to find and recruit suitable candidates [20]. Many companies are now using virtual recruitment as a viable means for recruiting workers.

The concept of a "virtual organization," where a company completely or partially outsources one of its non-core activities, is not novel. Over the past few years, the concept of outsourcing has received mixed reviews from the business world in terms of its effectiveness [25, p. 853]. The information technology (IT) industry has embraced the idea; so has the Human Resource Management (HRM) industry. Many companies are now reducing their non-core business activities such as employee recruitment and outsourcing such functions to consulting firms. Functions typically outsourced in the IT industry tend to focus on internal support services, such as management of servers and desktop computer support. Other industries such as the pharmaceutical industry also contract with external consulting firms to carry out large-scale clinical trials on products without having to maintain a complete department that would not be used for long stretches of time once a particular clinical trial is completed. Similarly, in the sales environment, industries are increasingly relying on outsourcing.

Companies outsource their employee recruitment function at varying degrees from a simple company-consultant relationship to business partnership agreements with shared goals. Regardless of the business relationship, outsourcing can offer a commercially viable alternative to setting up and maintaining departments that may not be used constantly, an option which is particularly attractive to companies faced with massive budget cuts. A company's employee recruitment function is a prime example of how virtual recruiting can be beneficial to the company. Recruitment for most companies comes in waves. A company may wish to insulate itself against an eventual lull in recruitment activity and the necessity to lay off human resource staff by engaging in virtual recruitment.

Given the growing interest in virtual organizations in management literature, there is a preponderance of research on the possibilities of virtual meetings, work teams, offices, factories, firms, and alliances. However, little empirical research exists on virtual organizations [12], and surprisingly, very little has been done on virtual recruitment. This paper is an initial attempt at setting an agenda for possible sustained research on the impact of technology-based systems such as virtual recruitment systems on employment interviews. This paper discusses (1) the employment interview and its role in virtual recruiting, (2) virtual interviewing within the framework of computer-mediated communication (CMC), (3) organizational applications of virtual recruiting systems, (4) virtual organizational communication and how its attributes lend themselves to implementing virtual interviewing in organizations, (5) the relationship between virtual organizational communication and virtual recruitment , (6) Internet-basd interviewing in the context of transaction economics, (7) whether or not virtual interviews will replace traditional interviews, and (8) managerial implications of virtual recruitment and interviewing in organizations. This paper concludes by proposing areas for further research.

## 2. The Employment Interview and Virtual Recruiting

The employment interview is an interactive process in which the prospective employer and the applicant assess and select each other. Organizations typically use the interview to recruit and select employees. Even though extensive research exists concerning the selection of applicants, recent changes in competitive markets have made the ability to attract and retain the very best employees more critical to organizational success. Organizations are constantly looking for the most efficient and cost-effective means of conducting employment interviews. Given recent advances in computer-mediated communications (CMC), especially the pervasiveness of technological advances such as multimedia and the Internet, personnel recruitment vendors are busy developing new virtual (electronic) recruiting systems to enable both companies and applicants participate in the employment screening and selection process quickly and in the most cost-effective manner. Recruiters can also conduct global recruitment using technology-based solutions.

Of particular significance to using virtual recruitment systems to select candidates is the risk which traveling to distant locations has now imposed on recruiters and applicants given the current climate of global terrorism, exacerbated by the September 11, 2001, attacks in both New York City and Washington, D.C.

Other issues which have motivated companies to consider using technology-based recruitment systems, in addition to the simple objective of selecting the best candidate who has a great "fit" with the organization, have become paramount. These issues include the proximity of the applicant to the recruiter (the location of the applicant and the recruiter which attenuates the specter of potential terrorist attacks against the applicant and the corporate recruiter), the most appropriate channel to use in conducting the interview (written, interpersonal, or virtual), and which medium affords the participants the best opportunity to evaluate each other.

Employment interviewing and recruiting is an expensive, high-stakes game. Even for relatively unskilled employees search costs can amount to several thousand dollars. The U.S. Department of Labor estimates that it costs a company one-third of a new hire's annual salary to replace the previous individual [37], while other sources propose figures in the range of 1.5 to 2.5 times annual salary [7]. Moreover, unsuitable employees waste valuable firm resources, including compensation, training, and supervisory effort. Simple, comprehensive, and effective methods of identifying and screening potential employees are an attractive tool for employers.

Technology-based recruitment applications have received significant attention from businesses since the emergence of the Internet. Existing technology makes it feasible for employers to screen and interview prospective employees in geographically dispersed locations nationwide and globally. Current trends suggest that virtual recruiting will constitute a significant portion of human resource management activity in the future.

One of the major activities involved in recruiting high-caliber employees is the employment interview. Employment interviews fall under the rubric of interpersonal communication which will be impacted by the all the elements of the communication process: sender, receiver, message, channel/ medium, feedback, and environment. While trade publications, college Web sites abound with information about virtual recruiting, very little research-based studies exist which explain the extent to which technology-based systems will impact employment interviews conducted in a "virtual" or electronic environment.

## 3. Computer-Mediated Communication and Virtual Interviews

Computer-mediated communication (CMC) systems have now become an integral part of society, since they span education, industry, and government. In order to appreciate fully the impact of CMC on various organizational processes, it is necessary to define the term, since CMC means different things to different people.

Computer-mediated communication (CMC) refers to both task-oriented and interpersonal communication systems conducted using computer. This includes asynchronous communication (via e-mail or electronic bulleting boards); and synchronous communication ("chatting" or group software); and information manipulation, retrieval and storage through computers and electronic databases [17]. CMC is a process of human communication via computers, involving people, situated in particular contexts, engaging in processes to shape media for a variety of purposes [10]. Other researchers have attempted to reconcile the various attempts at defining CMC by offering this perspective--CMC comes in increasing number of forms; the technologies for mediating CMC are changing rapidly; diversity of users and uses is increasing; and many forms of CMC, particularly where interpersonal communication is concerned, seem to explicitly or implicitly serve multiple purposes. For instance, Murray presents an approach to CMC which treats CMC as a form of communication that is socially constructed, is subject to multiple research methods, and renders any attempt at overt generalization meaningless [27].

Virtual interviewing (VI) is an umbrella term which refers to a variety of computer-mediated communication (CMC) tools used to screen, recruit, and hire employees in geographically dispersed locations. Whereas electronic mail has been a frequent subject area for previous communication research, the global Internet today offers a more diverse set of tools and contexts for communication than it has in the past.

The drive to improve efficiency has given rise to an elevated interest in technology management ranging from ownership to use of new technologies. While many technologies tend to be of primary interest to one or two industries, almost all industries have an interest in information technology (IT). Most companies today cannot function without a computer system. These have been employed in all business areas, from education to manufacturing to construction. Management personnel are realizing that their competitive edge may hinge on the ability of their computer and communication systems to respond quickly to changing business needs. Consequently, business has to stay abreast of competitive moves in the use of CMCS and in many cases, be prepared to stay ahead of the competition [19].

A growing consensus amongst scholars, politicians, business leaders and the news media is that technologies traditionally referred to as new media are indispensable to the sum activities now referred to as electronic-commerce (e-commerce) and business-to-business (B2B) [32]. New media incorporates what is commonly known as multimedia. The term multimedia generally refers to the convergence of images, graphics, sound, voice, videotext and tubular information within a human interface that uses capabilities to access and present information. The primary marketing advantage of CMCS these days is the inclusion of multimedia facilities [21]. Such facilities may be used for videoconferencing, personnel training, as well as an interactive mechanism between management and employees or potential employees.

In contrast to long-distance telephone interviews, videoconferencing enables the candidate and the interviewer to see each other on screen. Moreover, better cameras and clearer links have improved videoconferencing in recent years. Even employers who prefer the traditional face-to-face interview concede that video technology is useful for weeding out undesirable job candidates. The employer is able to study the interviews in close detail and can replay parts of the interview to assess reaction or response—something not possible in a conventional interview. The next section discusses some applications of virtual recruiting systems which various organizations are now using to satisfy their employee recruitment needs.

## 4. Organizational Applications of Virtual Interviewing Systems

Technology is changing how companies recruit and select applicants [36]. Even though virtual hiring technologies are still in their infancy, current virtual hiring technological advances have the potential to enable recruiters to reduce hiring cycle times by 90 percent, anticipate what skills will be in demand before they can be articulated, and call up information about a potential candidate on their computer screens.

The growth in the use of CMC during the last decade surpassed even the most optimistic predictions [13]. The pervasiveness of CMC has spurred intense competition among companies that produce "virtual" (electronic) employee recruitment solutions. These solutions vary in terms of their delivery modes and across a wide range of industries, companies, and applications.

One form of CMC content delivery is videoconferencing via the video. Its effectiveness has been well documented elsewhere [4] [9]. Videoconferencing enables geographically dispersed parties to communicate with each other in real time, and asynchronous video presentations enable participants to access the contents of the video from anywhere, and at any time [35]. Videoconferencing can slash recruiting travel expenditures by 20 percent [20, p. 87]. With enhancements in video quality (30 frames per second, on par with television), some companies are now making videoconferencing a part of their recruitment arsenal.

Best International, a computer recruiting company, regularly uses videoconferencing to conduct employment interviews overseas. The technology not only eliminates the cost of overseas travel but expands the firm's recruitment base and saves time in screening job candidates. These days, thousands of companies like Best are turning to technology as a recruitment tool. Businesses are conducting virtual interviews from remote locations by establishing videoconference links around the world. Some companies videotape interviews of overseas job candidates, transfer the tapes to CD-ROM, then view the interviews at their convenience. Others use electronic file transfers, downloading interviews as e-mail files; and computer experts predict that conducting interviews via real time Internet video chats will become commonplace in the near future.

AT&T, Dell Computers, Shell Oil, Compaq Computer, and Nike are using videoconferencing to screen and select candidates. Other companies are using in-house systems which cost anywhere from $10,000 to $35,000, to screen candidates around the country. Management Recruiters International (MRI) in Cleveland, Ohio, uses a videoconferencing system called ConferView, to screen job applicants in 380 MRI offices. Hire Intelligence, a web-based recruiting firm in Houston, Texas, provides a service which allows recruiters to videotape interviews to a website. Corporations log on to this site (www.hiirs.com) and check out candidates for free [36]. Kinko's rents videoconferencing rooms at a quarter of its 900 stores for about $150 per hour; National Career Center in Boulder, Colorado, offers similar services in a more intimate setting through its SearchLINC videoconferencing system. This system is available through deals with major hotel chains such as Radisson and Hilton, and is expected to increase in the next few years.

Another form of CMCS is Interactive Voice Response technology (IVR), which has been used for a long time, is now being integrated with other database technologies to capture information about potential employees, giving the company more flexibility and speeding up hiring decisions [36, p. 73). Some companies have used is computer-assisted interviewing online to find the right hires.

Nike has used an Aspen Tree IVR technology product to hire employees for Niketowns, retail stores that showcase Nike products [36, p. 75]. The computer interview (which includes a video showing three scenarios for helping a customer and asks the applicant to choose the best one) is conducted in batches. A group of applicants is given 45 minutes to respond to the scenarios. As applicants complete their interviews, a printer in another room prints their responses. Areas that need to be probed further are flagged including indications of applicants' particular strengths. While applicants complete a virtual interview, the recruiter uses the applicant's printout to prepare for face-to-face, human interview. Since Nike uses behavior-based interviewing, virtual interviewing not only helps Nike's interviewers screen for applicants who lost their temper in work situations or who demonstrated other undesirable behaviors, it also helps interviewers to determine what to ask to reconcile inconsistencies in the virtual interviews or to probe applicant strengths in desired areas.

Coopers & Lybrand, one of the first companies to put its computer-assisted interviewing system on the Internet, also uses an Aspen Tree product. The company uses a website called Springboard. Applicants complete an employment application and four initial screening modules at their convenience by accessing the website and the Strategic Selection Advantage (SSA) Online application. The company has found a high correlation between high job performance ratings and superior performance in the SSA Online application. By taking the technology to the Internet, a company can reach prospective employers.

Innovex, Inc., a division of Quintiles Transnational Corp., a contract pharmaceutical company produces late-phase clinical studies to long-term marketing partnerships with pharmaceutical companies, uses an IVR product developed by TelServ of Cleveland, Ohio. Innovex uses IVR primarily to eliminate much of the labor of having people sift through large volumes of resumes. Applicants who respond to job advertisements call a tool-free number. They are asked a series of questions by a machine and those who meet the basic criteria are then referred to Innovex for face-to-face interviews.

Olsten also uses IVR technology developed by Wonderlic of Libertyville, Illinois, to prescreen applicants. According to Adrienne Plotch, vice president of professional service, IVR has saved the company significant staff time, and is accessible by applicants any time.

In spite of their widespread use, recruitment experts acknowledge that CMC systems use will increase, but it will not replace the personal interviews. Final interviews will always be face-to-face, in person.

## 5. Relationship Between Virtual Organizational Communication and Virtual Recruitment

A virtual organization has been described as a collection of geographically distributed, functionally and/or culturally diverse entities that are linked by electronic forms of communication and rely on lateral, dynamic relationships for coordination [12]. The components that make up a virtual organization are geographically distributed, functionally or culturally diverse, electronically linked, and connected via lateral relationships. These attributes enable the organization to dynamically modify business processes to meet market demands, to coordinate via formal and informal contracts, to define the boundaries of the firm differently over time or for different customers or constituencies, and to re-arrange relationships among components as needed. These attributes lend themselves well to virtual recruitment whereby some organizations establish relationships at different levels to enable them carry out certain non-core organizational functions such as employee screening and recruitment.

Few pure virtual forms exist today [14]. Instead, aspects of virtuality occur in many business enterprises. For example, although most companies still maintain a divisional structure, they increasingly are forming external relationships with other firms in the form of strategic partnerships, alliances, and outsourcing contracts [26] [28]. In addition, rapid advancements in telecommunication technologies have enabled more telecommuting and cooperation among physically distributed employees [2]. These trends suggest that firms are acquiring more virtual characteristics than in the past. Even firms that may not look virtual on the surface are organizing selected activities and processes, such as employee recruitment virtually.

Communication is fundamental to any form of organizing, but it is preeminent in virtual organizations. Without communication, the boundary-spanning among virtual entities would not be possible.

Virtual (electronic) communication enables parties to link across distance, time, culture, departments, and organizations, thereby creating "anyone/anytime/anyplace" alternatives to the traditional same-time, same-place, functionally-centered, in-house forms of organizational experience [30]. Virtual communication loosens constraints of proximity and structure on communication, making it possible for spatially or organizationally distant parties to exchange messages with one another [16]. Further, virtual communication provides an opportunity to signal interest in forming connections that otherwise would be difficult or impossible to maintain [18].

The exact nature of communication processes in virtual forms, their antecedents and consequences are, of course, unknown as of yet. However, it is possible to glean some insight from the rich body of literature on synchronous and asynchronous electronic organizational communication. Employee recruitment will certainly continue to become more electronically mediated than in the past, and the vast set of empirical findings regarding mediated communication can foreshadow how employee recruitment will change as firms "go virtual" with their employee recruitment needs.

## 6. Internet-based Interviewing and Transaction Costs

The strategic use of Human Resource Management (HRM) to enhance organizational performance has been examined in the literature. This approach "suggests that HR (both the function and the system) contributes directly to the implementation of the operating and strategic objectives of firms" [3]. The fact that progressive human resource practices which affect employee skills, motivation, and work design are associated with improved organizational performance, and an important component of those systems is "sophisticated selection procedures designed to screen out all but the very best potential employee" has been documented in empirical studies [11].

Although different conceptual models can be advanced to explain the links between HRM and organizational performance, transaction cost theory provides a particularly useful framework of analysis of the implications of new technologies in hiring employees. A fairly important issue of transaction cost economics is concerned with the nature of economic organizations as distinct from labor market exchanges. Therefore, transaction cost theory suggests that electronic recruiting could quite conceivably become the technological watershed of employment relations. This is because when viewed from a perspective of competitive advantage, Internet hiring for instance, will most certainly affect organizational strategies to maximize the value of limited labor resources [23].

According to transaction cost economics, organizations hire workers when the cost of purchasing labor on the open market surpasses the cost of long-term, relational contracting. At the core of this doctrine summarized is that "transaction cost economics is an effort to identify, explicate, and mitigate contractual hazards. In general, all hazards can be attributed to the twin behavioral assumptions from which transaction cost economics works: bounded rationality and opportunism" [38]. One can conclude from the behavioral assumptions, that an employment contract is necessitated when contingencies cannot be fully addressed through ex ante agreement.

Neither employers nor employees possess sufficient information to identify and negotiate over critical issues arising out of the labor purchase; thus, an independent contractor or market relationship is unacceptable to the parties [22]. Both employees and employers will strive to gain economic advantage from the relationship because of opportunism and the need to protect self-interest.

Two other characteristics that affect employment are: "fundamental transformation," and "asset specificity" [38]. In "fundamental transformations," even though the employment process starts out with large numbers bidding at the commencement of contracting, what happens later is ongoing dealings between parties. In "asset specificity," owners and workers come to a position of bilateral dependency through acquisition of firm-connected skills, unique technologies, and other idiosyncratic factors [38]. Because the costs of market transactions under such circumstances may be high, relational contracting through employment and its governance procedures minimizes contracting hazards [23]. Also, researchers have noted that internal corporate hierarchies and lavish upper management incentives innoculate organizations against hiring errors by restricting access to entry-level positions. Hence, opportunists are less likely to exploit firms by seeking lateral transfers. The preceding ideas are relevant to this analysis of the implications of virtual interviews as a global recruitment tool.

First, virtual interviews (VIs) expand the prospect of global recruiting. There are no effective geographical restrictions on the technology used for VIs. The potential reach for VIs offers the most expansive applicant pool with almost real time communication between buyers and sellers reminiscent of the large numbers bidding scenario that has been referred to as "fundamental transformations" [38]. The sheer size of the applicant pool that can be achieved using VIs guarantees organizations access to a wide pool of prospective applicants and quite likely, the most qualified. Invariably, competition for labor will subsequently generate repeat recruiting using VIs.

Secondly, the large number of potential applicants that VIs can attract calls for efficient methods of screening. VI is an efficient mechanism for rapidly eliminating unsuitable candidates thereby reflecting Williamson's earlier take on "fundamental transformation." Naturally, some problems cannot be fully eliminated. There is no foolproof way of ascertaining the truthfulness or accuracy of information on an audio tape or video tape, however, similar issues are encountered in traditional interviewing methods as well [24].

A third and final reference to transaction cost economics sheds more light on the relevance of employment trends. As Williamson points out, if markets could perform the "experience-rating functions," the need for entry level hiring and job progression would be mute. Recent research has documented apparent shifts in employment from job security and internal labor markets to flex work environments, virtual offices and outside contracting. These trends are driven by powerful forces undermining traditional employment practices [6]. To show how these trends are progressing with respect to white-collar employment, three factors driving the "transformation of managerial work" have been identified [31]. These factors are competitive pressures to reduce labor costs, new information technology, and the new ways of organizing work. A plausible implication is that these changes will likely affect the nature of managerial tasks and influence career patterns as ladders become shorter, the organiztion becomes flatter, and boundaries of all kinds become permeable.

Other researchers predict similar developments in work of all types. At the dawn of a new era in organizations, the boundaryless career has emerged as one of the new principles of employment. Some experts have even predicted the "end of the job" as employers shift toward contingent, short-term contracting [1] [5]. Others forsee a technological revolution which will generate massive upheavals in labor markets [33]. At the very least, job trends will probably result in a break with traditional approaches to HR functions [22]. One can reasonably conclude that organizations will become more sophisticated in acquiring and analyzing information about individuals and less reliant on long-term observation of work performance in evaluating employees. Technology will obviously play a prominent role in these changes.

It is clear then, that employers have reasonable motivation to use electronic technology for purposes of conducting job searches and recruiting qualified applicants. Although external factors create incentives for organizations to develop and implement strategic information systems, legal considerations may impose some constraints on the electronic job market.

## 6.1    A Basic Distinction

For practical reasons, a basic distinction about the possible tools for virtual interviews will be assumed. We will distinguish between real-time communication tools, such as Internet Relay Chat (IRC) and the forms of interpersonal communication allowed by Multi User Dimension, Object Oriented (MOO) and Multi-user Domains(MUDs) on one side; and delayed communication tools such as email, on the other. Real-time communication tools allow interactivity, the exchange of an immediate two-way flow of information. Delayed ones do not. This has certain implications for their performance.

IRC, MOOs and MUDs allow people to meet and interact. IRC is aimed at providing chat, enabling its users to literally talk to each other, in the sense that questions and answers actually follow each other. MOOs and MUDs are virtual environments where people can interact, based on Telnet.

The shortcomings of real-time communication tools are related to their interactivity. What we are used to, as real-time talk, is immediate question and answer. That is possible only partially on IRC, for instance. There still is a considerable delay between the subsequent messages, which sometimes makes the communication quite strange: you might ask a question and get an answer which was intended for the previous question. One has to type his/her message and submit it quickly, so it is not 100 % interactivity. However, the development is very fast and we are getting closer and closer to "true" real-time.

## 6.2    Interviewing via E-mail

The alternative to the previous methods of virtual interviewing is email. With email, interviewers formulate their questions, mail them to interviewees, and patiently wait for an answer. An email user does not expect any interactivity. He/she will formulate the questions as clearly as possible, and very straightforwardly, to reduce the chances of misunderstanding. Moreover, the interviewee has all the time to answer the questions, can reflect about it, and thoroughly explain details. E-mail is great for research interviews, dealing with complicated or controversial matters. Encryption technology now allows users to protect their messages.

E-mail also has a few shortcomings. Among them is of course the time delay between the mail containing interview questions, and the mail from your interviewee with answers to those questions. Moreover, nothing guarantees that your mail will be answered promptly.

## 7.   Will Virtual Interviews Replace Traditional Interviews?

Videoconferencing is not a substitute for a face-to-face interview, and a personal meeting would always be the first preference. But the advantages sometimes outweigh the disadvantages. This technology saves time, money and allows several locations to connect at once, in spite of major time differences.

We are all living in a world where technology is changing practically every instance. The place we go to work is also experiencing radical changes due to similar reasons. Every organization is trying its very best to capture market shares using cutting-edge customized solutions. This trend has also affected the way organizations are structured. Recent trends in organization structure suggest that they will become increasingly distributed, flexible and responsible to environment and market changes. The networked organizations emphasize on the multidisciplinary work arrangements linking people across organizational boundaries, less clearly defined authorities and multidirectional communication patterns [33].

The benefit of using diverse means for human resource practices cannot be overemphasized. The term multimedia has been coined to encompass a document or presentation that includes several delivery modes, and in practice, is used almost exclusively for computer-based material [34].

The appeal of network videoconferencing as a virtual interview tool for instance, derives from the breadth of interaction it offers; the user can see as well as hear the individual or members of the group at the other end. Even low-end videoconferencing systems offer interesting features such as document/application sharing and whiteboard tools that work across electronic conferencing links. These tools and applications make collaboration easy and reduce travel expenses.

Other factors contributing to the growing interest in videoconferencing include better compression techniques, maturing standards that encourage interoperability, high-speed LANs and WANs that support the data requirements of video, and high-performance multimedia computers. In addition, operating systems are multimedia enabled. Microsoft Windows includes a videoconferencing package called NetMeeting.

New uses for videoconferencing are also helping to drive development. In work environments, it is being used for tech support, distance learning, telemedicine, job recruiting interviews, direct sales, legal work, telecommuting, and manufacturing.

Employers can now see and judge appearance and body language to get a deeper sense of what applicants have to offer before flying them cross-country for interviews. This includes the capability of viewing applicants at multiple sites, in various states and countries, at the same time.

The potential for savings is obvious. Renting a videoconferencing room - the preferred option for companies who lack their own remote facilities --rarely costs more than a few hundred dollars per hour. Travel and hotel costs can easily exceed $3,000 [15]. Arguably, a more important benefit is the expanded labor pool that videoconferencing lets an organization reach.

## 8.  Managerial Implications of Virtual Interviews

The possibilities offered by virtual recruiting are great when it concerns social relations. Organizations can reach a lot of people in geographically-dispersed locations and gather first-hand information from job candidates--that is, by conducting virtual interviews with people wherever they are in the world, and at a very cheap price.  In spite of the widespread applications of virtual interviewing, several managerial implications are noteworthy.

First, there is no consensus among recruiters regarding the efficacy of virtual interviewing in recruitment decisions. Some argue that virtual interviewing makes it fairer for everybody, helps the interviewer choose the right people for the job, streamlines the hiring process, and allows the company to capture data that can be used later in hiring waves or in employee development and succession processes [36, p. 78]. Other recruiters are uncomfortable with virtual interviewing since they consider it a form of in-depth electronic profiling. They fear that electronic profiling will exclude people who do not fall within the desired response range, even though the applicant may have skills the company really needs.  In fact, they contend that Bill Gates would never had been hired for computer work if profiling had been used [36, p. 78-79].

Critics of virtual interviewing also contend that human interviewers may pick up cues that virtual interviewing could not.  By factoring in information the computer cannot anticipate, interviewers would be able to make better selection decisions.  If profiling selects people who have the same personality traits, diversity, which can be a company's asset, may be lost.

Even though vendors of computer profiling products claim that the profiling done  is often a safeguard against exclusion, some critics see computer profiling as a way for companies to exclude minorities [36, p. 79].  These vendors claim that they continuously test their data to ensure that questions do not automatically exclude any group.

Secondly, virtual interviewing is vulnerable to charges of discrimination under Title VII [23, p. 160].  Civil right laws prohibit employment practices which have a differential or disparate impact on specific groups. On one level, virtual recruiting can produce adverse impacts in the same way  as any other procedure, such as a written test or an educational credential.  A second and more problematic aspect of online recruiting, however, is that the technology itself may select against certain protected groups.  That is, access to employment on the Internet arguably excludes racial minorities, women, and older workers in greater relative numbers than young, white males for example.

The National Telecommunications and Information Administration (NTIA) used Census Bureau data to develop a profile of Americans' telecommunications access [29].  NTIA found that the "information have-nots" are disproportionately located in rural areas and central citites. Broken down by race, data indicate that rural black households have the lowest computer ownership of any group (6.4%), followed by Hispanic (12%) and Native American (15.3%).  Rural whites and Asians have the highest ownership, at 24.6% and 33.7%, respectively. Similar disparities appear in the central city populations. When minority households do have computers, they are less likely  than whites to have an Internet modem connection.

The NTIA survey also showed further differences in access to computers and modems by age, income and gender. Individuals under 25 and over 55 are the least likely to own computers. Among those owning computers, those between the ages of 25 and 34 have greatest access to modems. Moreover, as education and income increase, so does the likelihood of owning the necessary technology for Internet use. In a separate study analyzing the Census Bureau  data, the author found that women are slightly less likely to live in households with computers [8]. Invariably, certain groups appear to have unequal access to the Internet.

While virtual interviewing holds great promise as a viable recruitment tool, this technology-based tool it is not yet ready to replace the traditional face-to-face mode of interviewing. Also, even if groups which feel disenfranchised by virtual interviewing cannot successfully challenge virtual interviewing as unfair employment practice, the possibility presents a realistic threat to global implementation of virtual recruitment processes.

## 9.    Conclusion

This paper to has attempted to show proliferation of options available to organizations when they choose virtual interviews as a recruitment tool. It is apparent that VIs can help HR practitioners to locate and attract qualified applicants in a competitive labor market. The paper has argued that Internet- based recruiting will grow. By expanding HR procedures to include the Internet, recruiters can benefit from an inexpensive, convenient, and innovative process to attract potential employees. Employers can minimize the risk of discrimination claims by supplementing electronic recruiting with more traditional sources.

Virtual interviews will inevitably play a prominent role in human resource management activities. The Internet for instance, has the potential to profoundly reshape employee recruitment and selection, and its promise as a strategic tool in organizational staffing goals appear immense. If organizations are cautious, HR professionals can realize the benefit of using computer technology to identify and select employees while maintaining a diverse workforce and avoiding legal complications.

A pervasive theme in this paper the focus on communication volume and efficiency. Compared to face-to-face communication, virtual communication appears to increase the overall amount of communication between or among communicating parties. There is no doubt that people perceive significant differences in communication channels, but the hierarchy of preference is not clear. For example, will recruiters prefer face-to-face and telephone over computer-based conversations? What salient factors do recruiters consider in choosing communication media?

Assuming communication volume goes up in virtual organizations, it is safe to assume that intense pressures for communication efficiency will also occur. However gains in communication efficiency for a given task, especially employee recruitment, may be difficult to achieve electronically. The literature strongly suggests that problem solving and task completion are not faster when electronically mediated. Achieving efficiencies that are needed in the dynamic process design of virtual organizations will continue to be a challenge, requiring more systematic research.

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