Information Technology Worker Recruitment: An Empirical Examination of Entry-Level IT Job Seekers' Labor Market

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Communications of the Association for Information Systems

CAIS

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Abstract:

This paper investigates two actors in IT recruitment: IT job seekers and IT employers. Signaling theory and image theory inform this research. Signaling theory suggests that there are unique groups of IT job seekers and IT employers. Image theory explains the implications of groups of IT job seekers' have images of firms. Based on a closet qualitative study, we identify three images that IT job seekers use to classify employers: IT consulting firms, IT vendors, and non-IT-oriented firms that require in-house IT workers. To evaluate these images, we conduct two studies. Study 1 evaluates job seekers. Analysis of data collected from 491 entry-level IT job seekers suggests that unique groups of IT job seekers exist that possess distinct preferences for IT employers, firm and job characteristics as well as report different levels of preparatory job search activity. Study 2 focuses on the IT employers' perspective. We segment IT employers based on the IT job seekers' images. Results from a survey of 412 firm recruiters indicate that IT employers do not prefer different types of IT job applicants or engage in significantly different recruitment activities. Taken together, our studies provide a rich understanding of how IT job seekers view employers and how employers view job seekers.

Keywords: IT recruitment, IT job seekers, IT employers, job characteristics, signaling theory, image theory

I. INTRODUCTION

Information technology (IT) managers across industries consistently report concerns about IT worker recruitment [Luftman and Kempaiah, 2008; Luftman, Kempaiah, and Rigoni, 2009]. Managers are concerned about recruitment for two primary reasons. First, recruiting new employees is a frequent and expensive activity that can cost up to 150 percent of an IT position's annual salary [Zwieg et al., 2006]. Second, although unemployment levels in the IT workforce has fluctuated over the past decade (see Figure 1), industry leaders report a shortage of skilled IT workers [Seeley, 2008]. Due to the cost of recruiting and the uncertainty in IT labor markets, the ability to effectively recruit new IT employees is critical to maintain ongoing IT functions [Abrams, 2008; Schwarzkopf et al., 2004].

In spite of recent economic crises and growing unemployment in the United States, analysis suggests that the IT unemployment rate is about half that of the national average. Further, the U.S. Bureau of Labor Statistics (BLS) predicts dramatically increasing demand for a variety of IT work. By 2018, the BLS predicts that computer systems design jobs will increase by 95 percent, network systems analyst jobs by 53 percent and systems analysts jobs by 20 percent compared to 2008 numbers (Bureau of Labor Statistics, 2010a). There is further cause to be optimistic, as a joint study by International Data Corporation and Microsoft Corporation suggests that the IT industry will create over 75,000 new businesses and almost 6 million new jobs by 2014 [Microsoft Press Release, 2009]. As a result, IT managers can expect to invest more time and effort recruiting IT workers over the next several years.
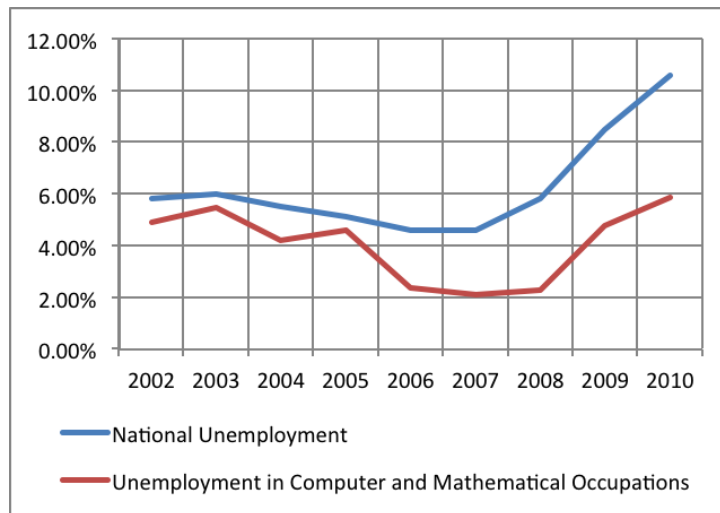
[Bureau of Labor Statistics, 2010b]

Figure 1. Unemployment Rates over Time

Despite managerial concern about IT recruitment, information systems (IS) and human resource management (HRM) researchers have not focused efforts toward understanding IT worker recruitment practices. In general, IS research either examines recruitment as part of a broader study of HR practices or narrowly focuses on the preferences of a single group of actors (i.e., employers or job seekers). Organization-level research examines the IT recruitment practices and preferences of large firms (Ferratt et al., 1999; Gallivan, Truex, and Kvasny, 2004; Zwieg et al., 2006] or frames recruitment as one aspect of the HR practices of a single firm [Roepke, Agarwal, and Ferratt, 2000]. Individual level IT job seeker research directs attention to personal [Goles, 2001], not group level, preferences for employers and jobs. If there are groups of IT job seekers with distinct preferences and search activities, IT employers may be missing the opportunity to identify the best practices to attract IT job seekers from these groups.

IS researchers have studied topics clearly related to recruitment. For instance, a stream of research addresses gender differences in the IT workforce [Gallivan, 2004; Igbaria and Cidambaram, 1997; Igbaria and Jack, 1995; Joshi and Schmidt, 2006; Trauth, 2002; Trauth, Quesenberry, and Yeo, 2008]. Research in this area also attempts to understand the factors that influence the attraction of women to the IT field [Adya and Kaiser, 2005; Tapia and Kvasny, 2004; Timms et al., 2008]. However, while these studies address the attraction, or recruitment, of women to

the IT field, they do not address the recruitment practices that firms use to bring in new IT professionals. Another related stream of research focuses on the recruitment of students to information systems and computer science degree programs [Aken and Michalisin, 2007; Alkadi et al., 2011; Cuny and Aspray, 2002; Dalhberg et al., 2008; Egan, 2010]. However, these research endeavors do not translate to understanding how firms value and attract IT recruits, or how IT job-seekers find work.

To identify best IT recruitment practices, HRM research directs attention to identifying distinct segments within IT labor markets and examining each one's implications for attracting applicants. Signaling theory suggests that the IT labor market may be segmented into unique groups of IT job seekers and employers characterized by shared preferences and search behaviors [Spence, 1974]. IT job seekers' preferences refer their desire for job characteristics, such as autonomy, security and opportunity for growth, and organizational characteristics, such as size, image or industry. For example, prior work finds that high-achieving entry-level IT workers seek jobs that offer creative and challenging work with opportunities for advancement [Smits, McLean, and Tanner, 1993]. HRM research finds that job seekers may be segmented into groups based on their preferences concerning an organization's size and image [Barber et al., 1999; Turban, Forret, and Hendrickson, 1998]. When segments exist in a labor market, firms can more effectively attract applicants by employing recruitment activities that narrowly target the appropriate labor market segment (see for example Barber et al., 1999).

Despite the opportunity to contribute to IT recruitment processes, IS literature has not examined whether the IT workforce can be divided into distinct groups. Although some research has examined IT professionals' preferred job characteristics (Smits et al., 1993), research has not examined whether more global preferences for employer type can meaningfully segment groups of IT job seekers. If global preferences relate to IT job seekers' specific priorities and job search behaviors, then we can meaningfully segment the IT workforce into groups based on their global preferences. To contribute to the development of more effective IT recruitment practices, we investigate whether the IT workforce may be segmented into unique groups of job seekers. On the IT employer side, we investigate whether the market of IT employers may be composed of unique segments based on IT job seekers' images of IT firms. Understanding the recruitment preferences of the IT employer market will provide guidelines to IT job seekers concerning the skills and characteristics desired by their preferred type of IT employer. Understanding the recruitment activities of the IT employer market may lead us to find gaps between the manner in which IT employers recruit and the manner in which groups of IT job seekers search for work. By matching the job search activities of IT job seekers within their IT labor market segment, IT employers may maximize the effectiveness of their IT recruitment activities. This research endeavor relies primarily upon the presence of unique groups of IT job seekers. If unique groups exist, we investigate whether there are corresponding, unique groups of IT employers. Therefore, we examine the following research questions:

RQ1: Can the IT labor market be segmented into unique, identifiable groups of IT job seekers?

RQ2: Can the market of IT employers be segmented into unique groups that correspond to the IT job seekers' images of IT firms?

To answer these questions, our paper begins by defining recruitment and explaining our focus on entry-level IT job seekers who are in the first stages of their job search. Then, we present signaling theory and image theory as means to understand how to segment markets of entry-level IT job seekers into distinct groups. To test for distinct groups, we first segment them based on a single factor, and then we investigate to see if there are group-level differences in preferences and behaviors. We test for distinct groups in both parts of the labor market. Study 1 seeks to identify IT labor market segments and their potential implications for entry-level IT job seeker's preferences and behavior. Study 2 evaluates whether firms may be segmented into corresponding segments based on job seeker perceptions and whether the firms adapt their recruiting practices to target specific entry-level IT labor market segments. Our study concludes with a discussion of our findings' implications for research and practice.

II. RECRUITMENT, SIGNALING AND FIRM IMAGE

Through IT recruitment activities, organizations seek to identify and attract IT job seekers with desired qualifications, specifically technical skills or personal values that meet organizational requirements [Zwieg et al., 2006]. We use this definition of recruitment:

[The] set of activities undertaken by the organization for the primary purpose of identifying a desirable group of job seekers [and] attracting them into its employee ranks [Taylor and Collins, 2000, p. 306].

We focus our study of IT recruitment on entry-level IT job seekers in the United States. We do so for two reasons. First, IT labor market characteristics may vary with factors such as location, work experience, and professional qualifications [Barber, 1998]. For example, practitioner reports suggest that demand for IT workers in emerging

economies such as India or China outstrips demand in developed economies such as the United Kingdom or United States [MacBeath, 2008]. Second, leading IT firms in the United States, such as Microsoft and IBM, have reported enduring concerns about their ability to attract desirable entry-level IT workers [Abrams, 2008; Seeley, 2008]. By restricting our focus, we seek to increase the internal validity of our study and to address the concerns of IT managers in a specific country.

Recruitment can be characterized as a three-stage process [Barber, 1998; Rynes and Barber, 1990]. In the first stage, job seekers and recruiters conduct an extensive search for information. As recruitment progresses, their search becomes narrowed to an intensive search focused on a target group. Finally, recruitment concludes with job choice or hiring new employees. Because little work has been done on IT recruitment, we investigate the initial stage: extensive search.

In the extensive search phase, entry-level IT job seekers identify job opportunities, and IT employers seek to communicate the set of opportunities afforded by their firm to potential applicants. During this phase, IT job seekers and IT employers have limited direct contact. Barber suggests that extensive search "is characterized by:

    (1) screening as opposed to final choice,

    (2) limited information about multiple opportunities, and

    (3) little, if any, interpersonal contact" [Barber, 1998, p. 14].

IT job seekers look to differentiate between job opportunities based on job or firm characteristics to identify the type of employer that is most congruent with their goals and values [Beach, 1990].

Signaling theory and image theory provide insight into the entry-level IT job seekers' mindset behind job search behaviors. Signaling theory frames each recruitment phase as a process of gathering and exchanging information through various channels [Spence, 1974]. Signaling theory suggests that each actor in the job search process sends and receives signals in an attempt to find an economic match. In this way, signaling theory focuses attention on the signals that are exchange between the job seekers and firms, as well as the channels through which those signals are sent and received. For instance, a job seeker sends signals to firms regarding their skills and experience through channels such as formal job applications. Firms send signals about the availability of work and the characteristics of the work environment through channels such as job listings. IT job seekers and recruiting firms exchange signals until each finds an acceptable match and they enter into an employment agreement. Signaling theory is particularly apt for recruitment research, and has been leveraged in a variety of recruitment studies (e.g. Braddy, Meade, and Kroustalis, 2006; Celani and Singh, 2011; Rynes, 1991; Turban and Greening, 1997).

Image theory suggests that decision makers select decision alternatives that provide the greatest level of congruence with their goals and self-image [Beach, 1990]. Image theory is particularly appropriate because it suggests that individuals make decisions and perform behaviors based on their personal goals and self-image. For instance, an IT professional seeking work as a consultant may see themselves differently than one preferring work as a programmer. As a result, image theory suggests that these different IT professionals may engage in different job search processes to accomplish their goals of finding suitable IT work. Other work, such as career anchor theory [Schein, 1971], may be useful in identifying the ways IT workers orient themselves towards their work [Crepeau et al., 1992; Hsu et al., 2003; Igbaria and Baroudi, 1993; Igbaria, Greenhaus, and Parasuraman, 1991; Igbaria, Meredith, and Smith, 1995; Jiang and Klein, 2002; McMurtrey et al., 2002). However, career anchor theory is descriptive, and is useful for understanding individual preferences and sources of career and job satisfaction. Image theory, on the other hand, can be used to explain and predict decisions and behaviors. For example, in the initial, extensive search stage, IT job seekers cast a wide net to collect information about groups of firms that match their desired end state, and provide characteristics that fulfill personal goals and values. Information may be gathered through a variety of channels, including recruiters [Rynes and Miller, 1983], recruitment websites [Braddy et al., 2006], or pamphlets and brochures [Rynes and Bretz, 1991]. Based on information gathered, job seekers assess their "fit" with potential employers and apply for jobs.

Signaling theory suggests that entry-level IT job seekers can be segmented into distinct groups based on common preferences and characteristics [Spence, 1974]. HRM research suggests that groups of job seekers have shared preferences for firm attributes, like image, and job characteristics, like autonomy, and that these preferences influence their perceptions of firms and their search behavior [Breaugh and Starke, 2000; Rynes and Bretz, 1991). Recruitment studies have found that organizational attributes, such as size, distinguish unique firm segments, and individual level attributes, such as need for achievement, segment job seekers into unique groups within broader labor markets [Barber, 1998; Barber et al., 1999; Greening and Turban, 2000; Kirnan, Farley, and Geisinger, 1989; Maurer, Howe, and Lee, 1992].

Research suggests that certain organizational characteristics may make some firms more attractive to occupational groups. For example, a firm can send signals about corporate social performance to become more attractive to potential employees [Turban and Greening, 1997]. Firms might do this by detailing their social endeavors on a corporate website, or by having recruiters highlight this aspect of the work environment. Since research suggests that individual job search activities may vary based on individual preferences [Breaugh and Starke, 2000; Rynes and Bretz, 1991], job seekers who desire a specific type of firm, such as a socially conscious firm, may search for employment opportunities in a manner different than other groups of job seekers. For instance, job seekers desiring a socially conscious firm might look for employment opportunities through contacts in charitable organizations or in niche trade magazines. Similarly, an IT job seeker who desires work with an IT consulting firm may search for work in a consulting firm differently than would one who desires in-house support work in a non-IT oriented firm.

When labor market segments exist, firms can increase the number of desirable applicants by sending signals targeted to the specific desires of the appropriate labor market group [Turban, 2001]. HRM research suggests that an organization's recruitment message influences job seekers' level of attraction and their likelihood of accepting job offers [Breaugh and Starke, 2000]. Thus, a recruitment message that is properly targeted to the labor market group should result in more effective recruitment activities. For example, if a firm employs a "green" strategy, it may attract job seekers who value the natural environment by sending signals about their environmental conscientiousness. Therefore, the effectiveness of recruitment activities may vary based on the content of the message, or based on the channels through which recruitment activities are conducted. For example, Barber et al. [1999] found that job seekers' search activity varied with their preferences for firm size. Findings suggest that job seekers preferring work in large firms began searching for work sooner and relied on more formal job search strategies, such as campus placement services, than the group preferring work in small firms [Barber et al., 1999]. Therefore, to effectively attract desirable applicants, signaling theory suggests that firms adapt their recruiting strategies to use channels, such as placement services or online listings, and send signals preferred by the desired groups of job seekers.

While signaling theory explains why IT job seekers may be grouped into labor market segments, image theory offers an explanation for how job seekers' impressions of potential employers influence their behavior. Image theory argues that individuals make decisions based on an outcome's perceived compatibility with their goals [Beach, 1990]. From this perspective, three cognitive structures, or images, are manifest in an individual's job search: the value image, the trajectory image, and the strategic image. The value image represents an individual's set of principles (e.g., what values are important) and provide grounds for developing goals for employment with specific employers. As an example, job seekers might interpret context cues, such as interaction with recruiters [Rynes & Miller, 1983], to evaluate whether a corporation's culture is consistent with their values. The trajectory image refers to the desired end state or goal [Beach, 1990] and represents a job seeker's mindset concerning what kind of company would be most desirable to work for. In this way, job seekers' views of organizational attributes, such as reputation, and job characteristics, such as compensation opportunities, influence their attraction to a firm [Turban et al., 1998]. Finally, the strategic image refers to an individual's plans for achieving desired goals [Beach, 1990] and thus directs job seekers' search activity. For example, job seekers perform different types of job search behaviors based on their preferences for firm size [Barber et al., 1999]. Overall, image theory suggests that the job seekers' behaviors, or outcomes of the strategic image, are outgrowths of their value and trajectory images regarding types of firms.

Based on signaling theory and image theory, we propose distinct groups of entry-level IT job seekers who share overarching images of IT employers. These overarching images will be manifest in the common preferences regarding specific organizational and job characteristics reported by groups of entry-level IT job seekers, as well as similar patterns of job search behavior among each group. An example would be job seekers with preferences for an IT consulting firm who focus more on image or creative work than job seekers with preferences for work in the IT support function of a large firm. Prior research supports this argument, finding that groups of job seekers who share a preference for a global firm attribute, specifically size, report distinct preferences for more narrowly defined organizational attributes and job characteristics [Barber et al., 1999]. After being segmented based on preference for firm size, different groups of job seekers also exhibit distinct job search behaviors [Barber et al., 1999]. Therefore, we search for unique segments of the IT workforce, which may be differentiated by specific sets of preferences and job search activities.

To evaluate IT labor market segments and their implications, we conducted two studies. Study 1 assesses whether segments of IT job seekers exist in terms of distinct preferences for firm and job characteristics and then in terms of distinct job search activities. If unique segments of IT job seekers exist, signaling theory suggests that firms will adjust their recruitment activities to attract desirable job seekers most interested in employment with their type of firm [Breaugh and Starke, 2000; Turban, 2001]. Hence, Study 2 examines whether firms may be segmented in a manner consistent with IT job seekers' images of IT employers, and if these segments correspond to differences in desired applicant characteristics and recruitment activities.

III. STUDY 1—ENTRY-LEVEL IT JOB SEEKER SEGMENTS, PREFERENCES AND BEHAVIORS

Study 1 examines whether entry-level IT job seekers may be segmented into distinct groups based on their preferences for type of IT employers. We anticipate that IT job seekers across segments will report distinct preferences for job/firm characteristics and report different job search behavior. To assess the validity of our argument, we conduct a multi-stage study on three college campuses.

First, we identified an appropriate theory to frame our research. From a review of IS research, we identified the concept of IT orientation [Niederman and Trower, 1993; Porat, 1978] as a useful way to segment entry-level IT job seekers' perceptions of firms. Introduced by Porat (1978), IT orientation refers to the role of information technology in a firm. IT-oriented firms produce new or transfer existing information technologies across firms. In an extension of Porat's work, Niederman and Trower [1993] distinguish among three types of IT-oriented firms: IT vendors, IT consultants, and third-party service providers. IT vendors focus on the production of new information technologies. IT consultants emphasize the transfer of the latest technologies across firms [Lee, 1999]. Niederman and Trower [1993] also argue that third-party service providers, which provide IT services to other firms, represent a distinct type of IT-oriented firm. Additionally, many non-IT oriented firms use information technologies to enable the production or service delivery of some non-IT product. These non-IT oriented firms need to staff an IT workforce to maintain these supplementary IT functions, thus representing a last potential category of IT employer. Although one can argue that many more specific categories of IT firms exist, we framed our interviews using Porat's typology because, in our experience, it is consistent with how students, who are often entry-level IT job seekers, describe potential employers.

After identifying an appropriate theoretical base, we employed a closet qualitative approach to glean insight into the validity of theory. The closet qualitative label applies to situations where relatively "weak" data yields rich insights into a research question [Sutton, 1997]. This approach refers to the application of relatively weak qualitative data in an otherwise conceptual or quantitative project. Because we did not have access to a significant amount of qualitative data, we could not meaningfully conduct more formal content analysis implied by techniques such as the revealed causal mapping technique [Narayanan and Armstrong, 2005]. This closet approach involves collecting qualitative data to get quick insight into a phenomenon that can lead to further theory development or empirical hypothesis tests [Sutton, 1997; Thatcher, Brower, and Mason, 2006]. This is a particularly useful tool for conducting studies in theory-poor or under-researched areas such as IT recruitment.

We selected this approach after careful consideration. First, we did not have access to deep qualitative data. Our access to interviewees was limited to a relatively small sample of student volunteers. To attract volunteers, we needed to keep the interviews brief. Also, given a shortage of prior research on job seeker perceptions and behaviors, this research required some insight into job seeker perceptions of the IT labor market to frame our hypotheses. We chose to leverage the closet qualitative approach to gather qualitative data to help frame our hypotheses for quantitative analysis. As a result, we were able to guide the hypotheses with qualitative data, yet provide generalizable results through tests on a large sample. In the next stage of our study, we use insight gleaned from interviews of entry-level job seekers to develop hypotheses about segments of IT labor markets and then use survey data to test them.

Our closet qualitative study employed two waves of semi-structured interviews with senior undergraduate students enrolled in MIS courses (e.g., systems analysis and design, decisions support systems, etc.) to evaluate how they perceived potential employers. We employed the closet qualitative approach because relatively little has been written about IT workers' experiences during the job search process [Ballou and Huguenard, 2008]. Therefore, while our theory was selected a priori, we framed our interview questions around the concept of IT orientation and understanding its relevance to IT job seekers. The interviews were semi-structured, with a scripted sequence of questions. We did ask branching questions ad hoc during the interviews, but always ultimately returned to the script to complete the specified sequence of questions. For the interviews, we engaged in theoretical sampling and selected interviewees who were seniors, MIS majors, and engaged in the job search process. The intent of these interviews is to lend insight into the validity of segmenting the IT job seekers based on IT orientation, as well as to identify potential differences between groups.

In our first wave of interviews, we probed whether IT orientation accurately represented students' images of IT employers. We interviewed eleven senior-level MIS students on a large, urban college campus (demographic characteristics of all interviewees appear in Table 1). All interviewees were graduating seniors who volunteered to help with the project. None of our interviewees were presently enrolled in any member of the research team's classes, reducing potential social desirability bias. The researchers took handwritten notes on responses to questions to eliminate any potential discomfort caused by recording the interviews. These interviews followed a

specific script. They began with a broad question and were followed by more focused questions. During the interviews, the interviewers also asked ad hoc questions to follow-up on emergent issues and topics. By incorporating some flexibility into our interviews, we were able to elicit information on whether IT orientation accurately captured how entry-level job seekers perceived firms. The flexibility enabled us to ask additional questions and to allow the interview to follow tangents that lead to greater detail concerning perceptions of IT employers. After conducting interviews, members of the research team met to review our notes and identified comments that did or did not correspond to the IT orientation categories suggested by Niederman and Trower [1993].

Table 1: Interviewee Demographics		
Characteristic	Interviews Round One	Interviews Round Two
Sample Size	11	16
Average Age	21.6	21.2
Gender	3 Female 8 Male	4 Female 12 Male
Race	1 Asian 1 Black 2 Hispanic 7 White	3 Asian 1 Black 1 Hispanic 12 White

Our first wave of interviews suggested that Niederman and Trower's [1993] presentation of IT orientation was consistent with how job seekers perceive potential IT employers. Interviewees suggested that they perceived some firms as being more IT intensive and others as less IT intensive, thus indicating agreement with the concept of IT oriented firms and non-IT oriented firms that require in-house technical support. When probed as to whether they perceived differences among types of IT oriented employers, interviewees distinguished between IT vendors and IT consultants by discussing the difference between creating IT and consulting on IT projects. One interviewee said, "I really want to work for an IT consulting company; they seem more social and focused on the customer. I don't want to end up programming my life away!" Interviewees consistently failed to distinguish between IT vendors and third-party service providers. When queried about the distinction between an IT vendor and third-party service provider, an interviewee responded, "You know, I never really thought about that difference; to me, those [two] kinds of firms really want people with strong technical skills." Interviewees were uniform in their assessment that both IT vendors and third-party service providers offered jobs that were "technical" and "difficult" in nature. Based on our first wave of interviews, we concluded that students perceive potential employers as members of three broad categories: creating new IT, consulting on IT, or providing in-house support for IT.

In our second wave of data collection, we interviewed sixteen senior-level students on two additional college campuses. The demographic characteristics (see Table 1) of these interviewees did not meaningfully differ from the first round of interviewees. We adhered to our format of beginning with a grand question and following up with more focused questions. In these interviews, we sought (a) to assess whether our adjusted typology (creating new IT, consulting on IT, and providing in-house support for IT) accurately captured entry-level IT job seekers' perceptions of IT employers, (b) to ensure that our typology captured the view of the broad population of entry-level IT job seekers, not just students enrolled in one MIS program, and (c) to seek more detail on differences entry-level IT job seekers perceive between types of IT employers.

Our second set of interviews confirmed that students' views of IT employers were consistent with our three broad categories. For instance, an interviewee noted the difference between IT vendors and non-IT oriented firms by stating that firms could be grouped based on whether they "design and develop [new] information technologies" or whether they focus on "effectively and efficiently us[ing] their [existing] IT." When asked for a more nuanced view of firms, one interviewee responded that her job search was "was really focused on [finding] a job that put her people skills to work" and she was not concerned with how IT was used in the firm. Instead, her search was framed by the employer's IT orientation at a high level, not about differences between specific types of IT oriented firms.

The interviews suggest that job seekers view firms' IT orientation as an indicator of several specific work characteristics, including the nature of the work, job opportunities, and stature of the firm. Entry-level IT job seekers perceived the in-house support work for non-IT oriented firms as offering less variety compared to IT consultants. One interviewee stated that this in-house IT work would involve "deal[ing] with the same systems and more than likely the same problems day in and day out." Another stated, "I may get tired of the monotony of the same company, same issues, same basic operations day after day. After a while it probably wouldn't be very challenging." In contrast, students thought that IT consulting firms were likely to offer more variety than in-house IT support work. One interviewee asserted that "IT consulting work would enable me to try different things with different types of companies." Another thought that IT consulting would be "challenging, because each particular case will have its

own unique solution." A third interviewee believed that consulting work "would constantly change as you work with many different companies."

Interviewees believed that IT vendors offered more opportunities for personal development and demanded more advanced skill sets than either IT consulting or in-house support work. One interviewee suggested working for an IT vendor work would allow more "room to be imaginative" and the chance to "create the next big thing." Another noted that IT vendors allow for "the ability to exercise your creative energy" when working with technology. While acknowledging opportunities for creativity, a third interviewee expressed the opinion that "IT vendors don't offer as many opportunities to be social; I want to talk to real people, not sit in front of a monitor all day."

Given our interview results, we believe that during the extensive job search phase, entry-level IT job seekers may be segmented into groups based on their trajectory and value images of IT employers. In terms of trajectory image, our interviews suggest that entry-level IT job seekers believe IT vendors, IT consultants, and in-house IT support offer distinct sets of work characteristics such as high levels of social interaction or continually interesting work. In terms of value images, our interviews suggested that entry-level IT job seekers also associate different types of IT employers with different values such as creating new systems versus maintaining systems. Consistent with signaling theory, our interviews suggested that entry-level job seekers may be segmented based on their beliefs about work offered by different types of IT employers. If entry-level job seekers' images associated with IT orientation segment them into groups, signaling theory suggests that each group should express distinct preferences for specific job and firm characteristics. Broadly, we propose:

> H1. Preferences for firm and job characteristics will vary across groups of IT job seekers.

For more focused hypotheses on specific facets of firm image, we return to our interviews to glean insight into how market segments of entry-level IT job seekers might differ. In developing these hypotheses, it is important to note that they are based on images reported by our interviewees as well as our exploratory factor analysis (EFA) of our survey data. In conjunction with our understanding of concepts identified in the recruitment literature, we used the interview data to label the seven dimensions that emerged from the EFA and develop hypotheses about their implications. Because our study participants are entry-level job seekers and had not actually held full-time IT jobs, these images may not be consistent with the actual work performed by employees of these types of firms, nor the more nuanced views of IT's role in firms found in the academic literature. However, given our interest in understanding market segments during the extensive search phase, we believe that the hypotheses accurately reflect differences in firm images from the view of entry-level IT job seekers.

Entry-level IT job seekers viewed IT employers as offering distinct types of work. The interviewees consistently reported that they perceived work with non-IT oriented firms to be less 'glamorous' than work with IT-oriented firms. Interviewees perceived this in-house IT work as consisting of having to "fix the problem[s]" and dealing with the "same systems and … the same problems day in and day out." Also, interviewees suggested that in-house jobs involved working with fewer new technologies because "non-IT business units [might] be resistant to change." Collectively, these comments suggest that from the job seekers' point of view, non-IT oriented employers are perceived as offering more mundane and routine work than IT-oriented employers. In contrast, our interviewees suggested that IT-oriented firms were perceived as offering varied and interesting work. Interviewees characterized IT consulting work as offering "variety," the chance to "try different things," and "the opportunity to be creative." Interviewees described IT vendor work as providing "room to be imaginative" and "constantly changing software." Hence, we propose that job seekers preferring work with IT-oriented firms are more interested in factors relating to the nature of the work than are job seekers who prefer in-house work with non-IT oriented firms.

> H1a. IT job seekers who desire employment with IT-oriented firms place greater emphasis on the nature of work than do IT job seekers who prefer non-IT oriented firms.

Our interviewees regularly described IT vendor and IT consulting work as more varied, more exciting, and more prestigious than in-house consulting. They described IT vendor work as the chance to create something important. One noted the chance "to create the next big thing" and another called IT vendor work "the crème-de-la-crème of IT jobs." Similarly, interviewees described IT consulting work as providing "important services" and coming up with "necessary solutions." We propose that IT job seekers who prefer work with IT-oriented firms are more concerned with prestige than those who desire to work with non-IT oriented firms. Hence,

> H1b. IT job seekers who desire employment with IT-oriented firms place greater emphasis on prestige than do IT job seekers who prefer non-IT oriented firms.

Interviews suggest that IT-oriented firms are perceived to offer greater opportunities for training and personal development. An interviewee noted that "there would be a constant need for training as new products are

developed" and another stated that "it would be extremely hard to keep up with all the updates." One interviewee suggested that IT consultants are "constantly being challenged and having to learn new technologies." Regarding IT vendor work, one interviewee noted the "constantly changing software" and multiple interviewees remarked on the chance to be "working with high-tech stuff." Conversely, the interviewees described in-house IT work as repetitive and requiring fewer skill sets. One student suggested in-house work offered "more simplicity" and another suggested "after a while it probably wouldn't be very challenging." Therefore, job seekers who prefer IT-oriented organizations may place greater emphasis on the chance to engage in personal development through training or the chance to work with cutting edge technology. Hence,

> *H1c. IT job seekers who desire employment with IT-oriented firms place greater emphasis on training and development than do IT job seekers who prefer non-IT oriented firms.*

Entry-level IT job seekers perceived consulting jobs as requiring significant amounts of travel. One interviewee simply stated, "Consulting involves a lot of travel." Another suggested that the "travel may be hard on my family." It appears that the interviewees view the travel requirements as intertwined with work variety. For instance, the interviewees continually described IT consulting work as involving "variety," "challenging," and "getting to work with new clients." One suggested that IT consulting work would be interesting "because each particular case will have its own unique solution." The travel obligations of IT consulting work was regularly inherent in interviewee comments. Therefore, we propose that individuals who desire IT consulting work place understand the travel obligations, and thus place less value on working in a specific location. Hence,

> *H1d. IT job seekers who desire employment with IT consulting firms place less emphasis on location than IT job seekers who desire employment with IT vendors or non-IT oriented firms.*

Our interview data suggests that entry-level IT job seekers believe IT oriented firms provide more opportunities for compensation and advancement. Our interviewees perceived IT consultants and IT vendors as offering higher levels of pay and benefits than offered by non-IT oriented firms. Our interviewees believed that IT consultants were likely to offer increased compensation in exchange for extensive travel and long hours required by the job. For example, one interviewee expressed the opinion that "although I'll work longer hours, there are more opportunities to advance quickly in a consulting company. If I do my job well, I've heard a lot about earning bonuses from friends who graduated the past couple of years." Also, our interviewees reported that they believed IT vendors offer opportunities for employees to acquire stock options as compensation for the technically demanding work. When probed on this issue, students cited examples of Google and Microsoft millionaires who helped create companies and reaped rich rewards. Therefore, when entry-level job seekers prefer IT-oriented employment, it may be in part because they value compensation opportunities more than those who are interested in non-IT employers. Hence,

> *H1e. IT job seekers who desire employment with IT consultants or IT vendors place greater emphasis on compensation and promotion than IT job seekers who prefer non-IT oriented firms.*

While IT job seekers perceived IT consultants and in-house IT workers as focused on satisfying their customers, they viewed IT vendors as having company cultures focused on innovation and fun in day-to-day work life. This emphasis on culture may flow from the perception that IT vendors provide IT job seekers the greatest chance to interact daily with like minded individuals. If employed by a vendor, one interviewee said that one plus would be the opportunity to "collaborate [on] ideas with others." Another suggested that "it'd be great to work with other smart and driven people to make technology." Entry-level IT job seekers emphasized that they felt IT vendors offered a more interesting work culture than IT consultants or in-house IT support positions. Thus,

> *H1f. IT job seekers who desire employment with IT vendors place greater emphasis on culture than do IT job seekers who prefer IT consulting or non-IT oriented firms.*

IT employers were perceived as offering different levels of job security and stability. The interviewees emphasized that they viewed non-IT oriented firms as offering great job security. When asked the positives of working in-house for a non-IT firm, one respondent simply stated, "Job security." Another thought that with an in-house position, "job security would probably be pretty great." In contrast, interviews perceived significantly less job security with IT consulting firms or IT vendors. Regarding IT consulting work, one interviewee suggested, "Job security may be dodgy when everybody in my company does the same basic thing. I'd have to worry constantly about whether this guy or that girl was better at it than me." Another echoed this thought, noting that as an IT consultant "you have to be the best at what you do." When considering IT vendors, comments echoed similar concerns. One interviewee stated, "There's probably a fair amount of pressure …, and if I didn't produce, … I'd be afraid that I'd get fired," and "I probably wouldn't feel like I had much job security." Our interviews suggested that entry-level IT job seekers who prefer in-house employment value job security at higher levels than those who prefer employment with IT-oriented firms. Hence,

H1g. IT job seekers who desire employment with non-IT-oriented firms place greater emphasis on job security than do IT job seekers who prefer IT-oriented firms.

While understanding what images IT job seekers associate with different types of firms provides insight into segments of IT job seekers, developing effective IT recruitment strategies requires firms to understand job seekers' search behavior. Image theory suggests that a decision-maker's desired goal, or trajectory image, influences the strategies selected to achieve the goal, or strategic image [Beach, 1990]. Signaling theory suggests, and HRM research confirms, that designing effective recruitment activities requires firms to understand how job search activities vary across labor market segments [Barber and Daly, 1994; Barber et al., 1999]. Specifically, HRM research finds that job seekers who prefer a specific type of firm; i.e., large or small, engage in different job search behaviors; i.e., formal or informal, based on that preference [Barber et al., 1999].

Job search behavior consists of two types of search activities: preparatory and active [Blau, 1994]. Preparatory job search activities refer to planning the job search, which includes activities such as gathering information about potential employers. Active job search refers to the actual communication with firms and involves activities such as sending out resumes or interviewing for a position. Self-reported job search behaviors are useful predictors of outcomes such as employment and person-job fit [Saks, 2006]. Job seekers who share preferences for firm type often share common perceptions of how to achieve employment with their desired firm type [Barber et al., 1999]. This is because similar value and trajectory images often lead to similar behaviors [Beach, 1990]; i.e., the strategic images of the job search activities perceived to be necessary to secure a job. If groups of job seekers share strategic images regarding job search, they will be manifested in the job search behaviors reported by group members. By understanding job search behaviors employed by groups of entry-level IT job seekers, we may identify ways that organizations can more effectively reach out to potential applicants and increase the efficacy of IT recruitment activities. Broadly, we propose:

H2. Job search behaviors vary across groups of IT job seekers.

Job seekers desiring employment with IT consulting firms believed that such work required a more aggressive approach to work than the other segments. Supporting this notion, recent work has found that IT workers in consulting and non-consulting firms report different levels of satisfaction with their career choices [Ballou and Huguenard, 2008]. The interviews suggest that job seekers in the IT consulting segment are interested in entering new companies, solving problems, and dealing with different business situations. We noted this attitude in statements such as "you are always presented with a unique situation" and "you get … to be creative in your solutions." When asked about their chances of success in this environment, these same job seekers often reported perceiving a need to be aggressive to find the right solutions. We suspect that the perceived aggressiveness of consulting company cultures likely attracts IT job seekers who will be more aggressive in their pursuit of desired employment outcome. As one interviewee noted, "consulting firms [tend] to promote consultants to partner or to kick them out … you have to be aggressive to succeed." Therefore, job seekers pursuing IT consulting work may perceive that they need to invest significant effort in searching and applying for jobs in order to convey that they possess the aggressive nature that IT consulting firms expect.

H2a. IT job seekers who desire employment with IT consulting firms invest greater effort in preparatory job search activities than do IT job seekers who desire employment with IT vendors or non-IT oriented firms.

H2b. IT job seekers who desire employment with IT consulting firms invest greater effort in active job search activities than do IT job seekers who desire employment with IT vendors or non-IT oriented firms.

Study 1 hypotheses are summarized in Table 2.

Study 1 Method

Study 1 surveyed the population of graduating MIS/CIS undergraduate students on three college campuses in the southeastern United States during the 2002–2003 and 2008–2009 academic years. Each campus reflected a distinct population. The first campus is a large, urban, research institution with more than 35,000 undergraduate students. The second campus is a mid-sized, rural, research institution with less than 15,000 undergraduate students. The third campus is small, suburban liberal arts institution with less than 3,500 students. Although data collection sites were in the southeastern United States, more than 30 percent of students were classified as "out of state;" e.g. drawn from different geographic locations.

All respondents were enrolled in senior level mis courses. Students responded to two surveys. The first survey collected information on desired employer characteristics. The second survey collected data on students' job search behavior. To avoid selection bias, all students in each course were asked to participate. Surveys were completed

Table 2: Study 1 Hypotheses	
H1.	Preferences for firm and job characteristics will vary across groups of IT job seekers.
H1a.	IT job seekers who desire employment with IT-oriented firms place greater emphasis on the nature of work than do IT job seekers who prefer non-IT oriented firms.
H1b.	IT job seekers who desire employment with IT-oriented firms place greater emphasis on prestige than do IT job seekers who prefer non-IT oriented firms.
H1c.	IT Job seekers who desire employment with IT-oriented firms place greater emphasis on training and development than do IT job seekers who prefer non-IT oriented firms.
H1d.	IT job seekers who desire employment with IT consulting firms place less emphasis on location than IT job seekers who desire employment with IT vendors or non-IT oriented firms.
H1e.	IT job seekers who desire employment with IT consultants or IT vendors place greater emphasis on compensation and promotion than IT job seekers who prefer non-IT oriented firms.
H1f.	IT job seekers who desire employment with IT vendors place greater emphasis on culture than do IT job seekers who prefer IT consulting or non-IT oriented firms.
H1g.	IT job seekers who desire employment with non-IT-oriented firms place greater emphasis on job security than do IT job seekers who prefer IT-oriented firms.
H2.	Job search behaviors vary across groups of IT job seekers.
H2a.	IT job seekers who desire employment with IT consulting firms invest greater effort in preparatory job search activities than do IT job seekers who desire employment with IT vendors or non-IT oriented firms.
H2b.	IT job seekers who desire employment with IT consulting firms invest greater effort in active job search activities than do IT job seekers who desire employment with IT vendors or non-IT oriented firms.

during regularly scheduled class times. A total of surveys of 771 surveys were collected. After screening the surveys to remove (1) incomplete responses, (2) duplicate responses, (3) students more than one year from graduation, and (4) students with prior full-time work experience, we had a useable sample of 491 unique responses. Since interviews were completed before the sample was developed, some respondents may have been involved in the interview process. However, to ensure anonymity and prevent any potential for desirability bias, we did not ask the survey respondents if they were interviewed. Table 3 presents sample characteristics.

Table 3: Sample Characteristics						
Student Sample			Firm Sample			
	Number	Percent			Number	Percent
Total Usable Responses	491		Total Useable Responses		412	
Gender			IT Orientation			
Male	319	64.7	IT Vendor		118	28.6
Female	172	35.3	IT Consultant		58	14.1
			In-House Consultant		236	57.2
Preferred IT Orientation			Firm Size in Employees			
Vendor	136	27.7	Minimum	Maximum	Std. Dev	Mean
Consultant	261	53.2	82	330,000	60,273	24318
In-house	92	19.1				
	Average	Std. Dev.				
G.P.A.	3.13	0.42				

Having screened the sample, we used K-S tests determine whether it was appropriate to pool respondents from the different campuses. K-S tests allow a researcher to determine whether respondents were drawn from the same population or distinct populations (Tabachnick and Fidell, 1996). We examined whether the sample differed in terms of gender, age, GPA, self-esteem, and preferences for organizational and job characteristics. Also, we examined whether responses differed based on the instructor for the course in which our respondents were enrolled. Our K-S tests did not suggest significant differences exist across campuses or instructors, suggesting that it was appropriate to pool the data used to examine our hypotheses.

Measures

With exception of IT orientation, survey instruments were constructed using measures drawn from the MIS and HRM literatures.

IT Orientation

Job seekers were asked to identify whether they would prefer working for an IT vendor, an IT consultant, or in an in-house IT position within a larger firm. 136 respondents indicated that IT vendors were their first preference. 261

respondents preferred working for IT consulting firms. Ninety-three respondents wanted to work as in-house IT employees within a larger organization.

Job and Firm Characteristics

Job and firm characteristics were measured using 25 items identified as germane to job seekers' preferences and behavior in prior research [Barber et al., 1999; Goles, 2001]. The measures asked respondents to assess how important they considered different aspects of a job such as autonomy or supervision as well as features of a firm such as Equal Employment Opportunity (EEO) policy or image. Items were measured using a five point scale where 1 = not very important and 5 = very important.

Job Search Behavior

Students' job search behavior was measured using Blau's [1994] preparatory and active job search behavior scales. To measure Internet use as a job search tool, we added 1 item to each scale. To the preparatory search scale, we added an item that asked job seekers how frequently they used the Internet to look for potential job leads. To the active search scale, we added an item that asked job seekers how frequently they posted their resumes on a web site. Items used a five point scale that ranged from 1 = 0 times to 5 = at least 10 times.

Size Preferences

Students were asked to report the number of employees of an ideal employer. Student responses were coded into nominal groups. In prior HRM research, studies have used diverse coding schemes to operationalize firm size; we integrated similar schemes to arrive at our coding format: small (1 to 99), small to medium (100 to 499), medium (500 to 999), and large (1000+) [Barber et al., 1999; Heneman & Berkley, 1999].

Self Esteem.

Research suggests that self-esteem influences job search behavior. We used Rosenberg's [1965] 10-item self-esteem measure to collect data on students' self-esteem. Items were measured using a five-point scale where 1 = strongly disagree and 5 = strongly agree.

Gender and GPA

Respondents self-reported gender and grade point average (a proxy for achievement orientation) because these measures have been tied to different IT worker perceptions in prior research [Ballou and Huguenard, 2008; Smits et al., 1993]. We relied on self-reports for these measures due to restrictions placed on access to data by our Institutional Review Board.

Analytic Techniques

Analysis was conducted in the following manner: first, we used factor analysis to assess the dimensionality of actors' preferences and behavior. Then, we used multivariate analysis of covariance to test the hypotheses. By using MANCOVA, we were able to test for group level differences between our proposed IT labor market segments and use more focused analysis (e.g., ANCOVA and tests of mean differences) to examine the relative influence of group membership on different dependent variables.

Hypothesis 1 Analysis and Results

Factor Analysis

We used exploratory factor analyses (EFAs) to confirm the dimensions of job and firm characteristics identified by our informants. Initial EFA results suggested that several items did not explain a significant amount of variance in the factors. Items with factor loadings lower than .30 explain less than 10 percent of the variance in a factor [Harman, 1967]. Also, Hair's rule suggests that items may not provide accurate measures of a factor when they cross-load at greater than .40 on a different factor. As a result, six items with factor loadings less than .30 or cross loadings greater than .40 were dropped from the analysis [Harman, 1967]. A second factor analysis yielded item loadings and cross-loadings that met commonly used guidelines for EFA. Our analysis identified seven factors in the data (see Table 4), which provide a parsimonious means to describe individual preferences.

To evaluate the strength of our EFA results, we used LISREL 8.8 to estimate confirmatory factor analyses (CFAs). The first CFA estimated a one-factor solution. CFA results suggested a one-factor solution was a poor fit with the data (NFI = 0.73, CFI = 0.71, AGFI = 0.81, RMSEA = 0.10). The second CFA estimated a seven-factor solution, which yielded evidence of a strong fit of the seven-dimension solution to the data (NFI = 0.90, CFI = 0.94, AGFI = 0.91, RMSEA 0.05). Given the EFA and CFA results, we mapped these seven factors to concepts identified as germane to understanding job seekers in the HRM and IS recruitment literature [Barber, 1998; Goles, 2001]: (1) nature of work, (2) prestige, (3) training, (4) location, (5) HRM policies, (6) company culture, and (7) security.

Table 4: Job Seekers' Preferences - Exploratory Factor Analysis Results								
Factor	Characteristic	Factor Loadings						
		1	2	3	4	5	6	7
Factor 1—Nature of Work	Autonomy/Responsibility/Challenge of Jobs	**0.75**	-0.04	0.14	0.12	0.09	0.13	-0.02
	Involvement in Decision Making	**0.64**	0.26	0.18	-0.12	0.19	-0.13	0.01
	Personal Growth	**0.62**	0.29	0.12	-0.01	-0.01	0.18	0.22
	Meaningfulness of Work	**0.61**	0.22	0.25	0.1	-0.12	0.24	-0.02
Factor 2—Prestige	Company Image	0.05	**0.88**	0.05	-0.02	0.07	0.11	0.06
	Industry/Product Image	0.15	**0.82**	0.14	0.03	0.03	0.13	-0.08
	Prestige	0.31	**0.59**	0.04	0.06	0.19	-0.08	0.08
Factor 3—Training and Development	Opportunities to Develop New Technology	0.13	0.15	**0.76**	-0.05	-0.01	0.00	-0.08
	Supervision	0.25	0.07	**0.69**	-0.17	0.07	-0.21	0.02
	Training Opportunities	-0.03	0.02	**0.64**	0.21	0.09	0.22	0.01
	Mentor Program	0.28	0.01	**0.64**	-0.05	0.01	0.21	0.05
Factor 4—Location	Frequency of Relocation	0.15	-0.03	-0.1	**0.81**	0.04	-0.12	-0.08
	Location	-0.06	0.07	0.05	**0.8**	0.11	0.07	0.06
Factor 5—Compensation and Promotion	Starting Salary	-0.11	0.12	-0.04	0.11	**0.66**	0.08	0.17
	Benefits and Perquisites	0.11	0.16	0.16	0.16	**0.64**	0.10	0.16
	Opportunity for Promotion	0.2	-0.05	0.02	-0.09	**0.68**	-0.01	-0.35
Factor 6—Culture	Opportunity to Make Friends at Work	0.01	0.04	0.13	-0.06	0.12	**0.77**	0.04
	Company Culture	0.3	0.13	0.01	0.03	0.03	**0.7**	-0.09
Factor 7—Job Security	Job security	0.1	0.02	-0.02	-0.03	0.10	-0.04	**0.88**
Eigenvalue		4.04	1.73	1.46	1.24	1.18	1.1	0.99
% of Variance		21.25	9.11	7.66	6.52	6.23	5.77	5.22

MANCOVA

Next, we used MANCOVA to test whether the seven factors differed across groups defined by IT orientation. Because group sizes differed, we used Levene's Test of the Equality of Error Variances to test the assumption that the variances of each dependent variable are equal across groups. Non-significant Levene's test suggested that the homogeneity of variances assumption is met [Tabachnick and Fidell, 1996]. As a result, we proceeded with multivariate and univariate analysis of the data.

MANCOVA results indicated that job seekers' preferences vary with their preferences for potential employers' IT orientation. We used Wilks' Lamba (λ) and Eta-Squared (η^2) to determine whether mean differences existed across groups of IT job seekers. The Wilks' λ is the ratio of the determinant of the error cross-products matrix to the determinant of the sum of the error and effect cross-product matrices. It is an estimate of the likelihood of the data occurring under the assumption of equal population means across groups against the likelihood that sample means are identical across groups [Tabachnick and Fidell, 1996]. Our Wilks' λ was significant (.91; F-test = 2.33, hypothesis df = 14, error df = 704 p = 0.00), suggesting that IT orientation significantly related to job seekers' preference for organization and job characteristics. Also, the Eta-squared (η^2 =.07) suggests that IT orientation explained a modest amount of the variance in job seeker preferences. Before examining each dependent variable separately, we examined the power of the multivariate tests. When power is high, a test is more likely to find a significant relationship where one genuinely exists [Baroudi and Orlikowski, 1989]. Power estimates for IT orientation (β = .98) suggest that Wilks' λ accurately detected that differences exist across groups. Taken together, the Wilks' λ and η^2 provide evidence that different groups of job seekers have different preferences for job and firm characteristics.

ANCOVA and Mean Differences

To better examine differences across IT labor market segments, we use/employ ANCOVA and associated mean differences. ANCOVA results suggest that job seekers' preferences for firm and job characteristics vary in conjunction with their preferences for firm IT orientation. Specifically, our analysis suggests that preferences for IT orientation resulted in significant differences concerning preferences for the Nature of Work (F= 11.33, p < .00, η^2 = .05, α = .99), Prestige (F= 9.74, p < .00, η^2 = .04 α = .98), and Job Security (F= 8.74, p < .00, η^2 = .05 α = .97). To gain a deeper understanding of how job seekers' preferences for firm IT orientation relate to their preferences for firm and job characteristics, we examined the means estimates associated with group membership. In doing so, we used the Bonferroni adjustment for multiple means with a .05 level of significance. Table 5 presents estimates of mean differences.

Table 5: IT Orientation and Mean Differences Across Groups[a]							
Dependent Variable	Organizational Preference	Mean	Std. Err.	Dependent Variable	Organizational Preference	Mean	Std. Err.
Nature of Work	Vendor	4.21	0.05	Compensation and Promotion	Vendor	4.14	0.08
	Consultant	4.21	0.04		Consultant	4.14	0.06
	In House	**4.01[b]**	0.09		In House	4.08	0.14
Prestige	Vendor	3.82	0.07	Culture	Vendor	3.86	0.07
	Consultant	3.84	0.05		Consultant	3.75	0.05
	In House	**3.41[b]**	0.12		In House	3.70	0.11
Training and Development	Vendor	3.59	.07	Job Security	Vendor	4.55	0.05
	Consultant	3.70	.09		Consultant	4.31	0.09
	In House	3.57	.06		In House	**4.70[b]**	0.04
Location	Vendor	3.66	0.05				
	Consultant	3.77	0.04				
	In House	3.68	0.09				
[a.] Calculated using the Bonferonni technique							
[b.] Significantly Different from Vendor							
[c.] Significantly Different from Consultant							

Results

We found support for four of eight hypotheses regarding IT orientation and preferred firm and job characteristics. Specifically, we found support for the following hypotheses:

H1. Entry-level IT job seekers are segmented into groups defined by preferred employer IT orientation.

H1a. Entry-level IT job seekers of the in-house market segment valued the nature of the work less than members of IT-oriented market segments.

H1b. Entry-level IT job seekers of the in-house market segment valued prestige less than members of the IT-oriented market segments.

H1g. Entry-level IT job seekers of the in-house market segment value job security more than members of the IT consulting segment.

Collectively, we believe these results provide initial evidence that the entry-level IT workforce may be segmented into groups based on their preferences for IT orientation.

Hypothesis 2 Job Seekers and Job Search Behavior

Factor Analysis

Our EFA suggested that a two-factor solution presented a reasonable explanation for variance in the data (see Table 6). Also, the two-factor solution (NFI = 0.92, CFI = 0.93, AGFI = 0.96, RMSEA = 0.09) slightly outperformed the one-factor solution (NFI = 0.91, CFI = 0.93, AGFI = 0.86, RMSEA = 0.12). Given that the two-factor solution is consistent with prior research (Blau, 1994), we used preparatory and active job search in our MANCOVA to examine hypothesis 2.

Multivariate Analysis of Covariance

To determine whether the data met MANCOVA assumptions, we examined Levene's Test of the Equality of Error Variances. The data did not violate MANCOVA assumptions. Next, we tested whether mean differences in preparatory and active job search behavior existed across groups of IT job seekers [Tabachnick and Fidell, 1996]. Gender, GPA, self-esteem, and preferences for firm size were used as covariates. IT orientation's Wilks' λ is significant (.97; F-test = 3.00, hypothesis df = 4, error df = 716, p = 0.00, η^2 = .03, α = .80). Results suggest that job search behavior varies with job seekers' preferences for potential employers' IT orientation.

Univariate Tests

ANCOVA results suggest that preferences for IT orientation are linked to job seekers' preparatory (F = 5.02, p = .01, η^2 = .03, α = .76) and not active (F = 3.39, p = .15, η^2 = .00, α = .39) job search behavior. To extend understanding of IT orientation's relationship to preparatory job search behavior, we examined mean differences associated with group membership and the covariates (see Table 7).

Table 6: Job Search Behavior Factor Analysis			
Factor	Activity	Factor Loading	
Active Job Search Behavior	Sent out resumes to potential employers	0.88	0.22
	Had a job interview with a prospective employer	0.80	0.12
	Filled out a job application	0.80	0.14
	Posted your resume on an Internet site	0.73	0.37
	Telephone a prospective employer	0.66	0.39
	Contacted an employment agency, state employment service,	0.60	0.36
Preparatory Job Search Behavior	Used faculty (school) contacts to generate potential job leads	0.17	0.76
	Spoke with previous employers or business acquaintances	0.16	0.72
	Talked with friends or relatives about possible job leads	0.29	0.71
	Prepared/revised your resume	0.33	0.70
	Read a book or article about getting a job or changing jobs	0.17	0.62
	Used the Internet to look for potential job leads	0.22	0.60
Total Variance Explained		44.17	10.18
Eigenvalue		5.30	1.22

Table 7: Job Search Behavior and Mean Differences			
Search Behavior	Organizational Preference	Mean	Std. Error
Active Job Search	Vendor	2.66	0.09
	Consultant	2.47	0.06
	In-House	2.46	0.10
Preparatory Job Search	Vendor	2.48	0.07
	Consultant	2.46	0.05
	In-House	2.16[bc]	0.08
[a.] Calculated using the Bonferonni technique			
[b.] Significantly Different from Vendor			
[c.] Significantly Different from Consultant			

Results

In the extensive search phase, we found that entry-level IT job seekers in different IT market segments report different levels of job search activity (H2). Specifically, we found that job seekers of the in-house market segment conduct less preparatory job search activity than members of the IT-oriented market segments (H2a).

We summarize results for Study 1 in Table 8.

Table 8: Study 1 Hypotheses	
H1.	Entry-level IT job seekers are segmented into groups defined by preferred employer IT orientation.
H1a.	Entry-level IT job seekers in the in-house market segment value the nature of the work less than members of IT-oriented market segments.
H1b.	Entry-level IT job seekers of the in-house market segment valued prestige less than members of the IT-oriented market segments.
H1c.	Not supported.
H1d.	Not supported.
H1e.	Not supported.
H1f.	Not supported.
H1g.	Entry-level IT job seekers of the in-house market segment value job security more than members of the IT consulting segment.
H2.	Entry-level IT job seekers in different IT market segments report different levels of job search activity.
H2a.	Entry-level IT job seekers of the in-house market segment conduct less preparatory job search activity than members of the IT-oriented market segments.
H2b.	Not supported.

IV. STUDY 2—ORGANIZATIONS AND IT RECRUITMENT

Given the evidence of segments of IT entry-level job seekers, we extend prior work by examining whether IT orientation, as conceptualized by IT job seekers, relates to firm preferences for applicant characteristics and recruitment activities. This is important for two reasons. Practically, it provides an opportunity to evaluate whether entry-level IT job seekers' beliefs about IT orientation correspond to firm preferences for applicants. Theoretically,

signaling theory suggests when market segments exist, employers should "adjust" recruitment activities to target groups of job seekers in order to increase the number of applicants. Although theoretically important, scant research has tested whether organizations' recruitment practices vary across market segments within specific industries [Barber, 1998]. Instead, HRM and IS recruitment research has focused on developing profiles of what qualities firms desire in job seekers [Lee and Choong Kwon, 2006; Todd, McKeen, and Gallupe, 1995; Zwieg et al., 2006].

In the extensive search phase, signaling theory suggests that effective recruitment activities focus on attracting applicants from specific segments that possess desirable characteristics and who are willing to accept employment with a firm [Rynes and Barber, 1990; Spence, 1974]. From the job seeker's point of view, IT orientation influences the skills or personalities firms consider desirable in IT job seekers. Consistent with the job seeker's view, Niederman and Trower [1993] argue that IT orientation influences how firms seek "personnel with different attributes, (as well as) train and socialize personnel" (p. 226). Consistent with our interviewees' comments, Niederman and Trower argued that non-IT oriented firms will prioritize 'soft' skills, in terms of an emphasis on customer service and business skills. Alternatively, they suggest that IT-oriented firms will emphasize 'hard' skills in order to facilitate software development and problem solving. Due to the perceived differences between firm types suggested by our interviewees and related academic research, we hypothesize that IT and non-IT oriented organizations will desire IT job seekers that possess different skills or characteristics. Hence,

H3. Organizations of different IT orientations prioritize recruit characteristics differently.

To illuminate why firm preferences may differ, we draw on images of IT and non-IT oriented firms found in our interviews and in IS literature (see Ahuja et al., 2007; Lee, Trauth, and Farwell, 1995; Niederman and Trower, 1993; Snell, Snell-Siddle, and Whitehouse, 2002). Consistent with our interviewees' image of non-IT oriented firms, Niederman and Trower argue that non-IT oriented firms develop cultures characterized by an emphasis on customer service and business orientation. This emphasis on soft skills suggests that non-IT oriented firms place a greater emphasis on recruiting congenial employees with the social and communication skills necessary to communicate with non-IT personnel. A survey of firms finds that IT employers assigned more importance to soft skills for IT positions that are common in-house positions: user support and training [Snell et al., 2002]. We propose that non-IT oriented firms will value soft skills more than IT vendors. Hence,

H3a. Non-IT oriented firms exhibit greater preference for job seekers with soft skills than do IT vendors.

Our interviewees suggested that IT-oriented firms emphasize technical skills in their selection process more than non-IT oriented firms do. Niederman and Trower's work extends this notion to suggest that IT-oriented organizations will develop cultures that focus more on technical skills and problem solving. For IT vendor work, we argue that technical skills are necessary for creating novel information technologies, and so IT vendors will place greater emphasis on IT skills and creativity than do non-IT oriented firms. Similarly, we argue that IT consultants are expected, by their customers, to understand IT products, and to be creative in developing technical IT solutions. Together, these arguments suggest that IT oriented firms value hard skills to a greater extent than do non-IT oriented firms. A survey of firms suggests that IT recruiters value technical skills to a greater extent than they do soft skills in regards to development and design positions [Snell et al., 2002]. These images are consistent with the idea that IT-oriented firms are more interested in the technical expertise and know-how of IT job seekers than non-IT oriented firms. Hence,

H3b. IT-oriented firms exhibit greater preference for job seekers with hard skills than do non-IT oriented firms.

Finally, our interviews and literature review suggest that IT-focused organizations expect IT staff to weather the long hours and stress tied to activities such as systems development, travel, and debugging code. For example, Ahuja et al. [2007] argue that traveling IT workers experience high levels of stress, which drives burnout and eventually turnover. Similarly, IT development work is known to be stressful and may drive out software developers who do not fit the development environment [Chilton, Hardgrave, and Armstrong, 2005]. Results from our interviews suggest that IT oriented firms are perceived to have much more demanding work than in-house work in non-IT oriented firms. As a result, we suggest that IT-oriented firms will value applicants with higher work ethic because they are likely to remain committed to their job despite the changing technology and work environment [Elizur, 1996; Ivancevich, Albert Napier, and Wetherbe, 1985]. Hence,

H3c. IT-oriented firms exhibit greater preference for work ethic than do non-IT oriented firms.

Given our evidence that unique segments of entry-level IT job seekers engage in different levels of preparatory job search activities, we examine signaling theory's proposition that organizations will adjust IT recruitment practices to target specific segments [Spence, 1974]. Little research examines the specific recruitment practices IT organizations

used to attract IT job seekers. Practitioner literature mainly relies on anecdotal evidence to identify best recruitment practices [Ford, 2000]. Descriptive academic research has identified an array of activities organizations use to deliver messages to potential applicants [Agarwal and Ferratt, 1999], but does not provide insight into sources of variance in firms' recruitment techniques.

By examining overarching firm segments, such as those defined by IT orientation, we take a first step towards understanding why firms select certain IT recruitment activities over others. HRM research suggests that organizational characteristics like size or image influence the selection of recruitment activities [Deshpande and Golhar, 1994; Marsden, 1994]. Barber et al. [1999] found that large firms employed more formal recruitment practices (e.g., college recruiting centers and objective evaluation criteria) and used different standards of effectiveness (e.g., number of hires instead of time to turnover) than smaller competitors. In addition, research shows that organizations with positive public images may have less difficulty attracting new employees and consequently invest less effort attracting job applicants [Greening and Turban, 2000; Turban and Greening, 1997].

Signaling theory suggests that because job seekers are attracted to firms with different IT orientations, firms will adjust their recruitment activities to target the IT labor market segments that are most interested in working for firms in their market segment. Firms will do so because they are interested in employees that not only have the appropriate skill sets but that also desire to stay with the firm over time. By attracting job seekers interested in staying with the firm, IT managers can control recruitment costs [Taylor and Collins, 2000]. Hence,

H4. IT orientation influences IT recruitment practices.

Based on Niederman and Trower's [1993] conceptualization of IT orientation, we develop more focused hypotheses about why recruitment practices might vary across organizations. We argue that non-IT oriented firms will emphasize the firm's business orientation and the need for an IT service culture when recruiting IT employees. Accordingly, we argue that non-IT oriented firms will collect information about recruits through channels that enable the assessment of the recruits' "fit" with their particular service cultures. Because informal channels offer opportunities to collect difficult-to-observe information on applicants' soft social skills [Bowen, Ledford, and Nathan, 1991; Isaacs, 1998], we believe non-IT oriented firms will rely on them more often than IT-oriented firms. Hence,

H4a. Non-IT oriented firms use informal recruitment channels to a greater extent than do IT-oriented firms.

IT-oriented firms may place a greater emphasis on technical skills than do non-IT oriented firms. Niederman and Trower [1993] suggest that IT-oriented firms may emphasize the technical skills and problem-solving orientation of IT recruits. Technical skills can be assessed in an objective manner through degree programs, skills testing, and certifications [Randall and Zirkle, 2005; Ray and McCoy, 2000]. Formal recruitment channels, such as placement services, allow candidates to be sorted and prioritized based on such objective information. Since indicators of desired technical skills, like degrees and certifications, can be measured objectively, IT-oriented firms may make more use of formal employment services than do non-IT oriented firms. By leveraging formal recruitment services, IT-oriented firms would be able to more efficiently search through a wider range of job applicants in order to select those who exhibit desired technical skills and aptitudes. In contrast, formal recruitment services may not offer non-IT oriented firms the chance to efficiently filter recruits based on soft skills. Therefore,

H4b. IT-oriented firms use formal recruitment services to a greater extent than do non-IT oriented firms.

We argue that IT-oriented firms experience higher levels of turnover among IT workers than do non-IT oriented firms. Research on turnover among IT consultants finds that the arduous work demands and difficult travel schedule cause work exhaustion and, further, turnover intention [Ahuja et al., 2007]. Similarly, the demanding work environment of software developers may create strain [Chilton et al., 2005] and drive turnover within IT vendors. Therefore, IT-oriented firms may more actively leverage college recruitment to continually replenish their workforce. Such college recruitment would consist of recruitment channels like participation in job fairs and internship programs. These recruitment programs would allow firms to directly interact with job seekers, and to provide a realistic perspective on the demands of work in IT-oriented firms. Thus, college recruitment programs may provide IT-oriented firms with a greater number of applicants, and with applicants who have realistic impressions of their intensive work demands.

H4c. IT-oriented firms use college recruitment to a greater extent than do non-IT oriented firms.

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Table 9: Study 2 Hypotheses	
H3.	Organizations of different IT orientations prioritize recruit characteristics differently.
H3a.	Non-IT oriented firms exhibit greater preference for job seekers with soft skills than do IT vendors.
H3b.	IT-oriented firms exhibit greater preference for job seekers with hard skills than do non-IT oriented firms.
H3c.	IT-oriented firms exhibit greater preference for work ethic than do non-IT oriented firms.
H4.	IT orientation influences IT recruitment practices.
H4a.	Non-IT oriented firms use informal recruitment channels to a greater extent than do IT-oriented firms.
H4b.	IT-oriented firms use formal recruitment services to a greater extent than do non-IT oriented firms.
H4c.	IT-oriented firms use college recruitment to a greater extent than do non-IT oriented firms.

Study 2 Method

We completed two waves of data collection from organizations that recruit recent college graduates for information technology jobs. In order to ensure external validity, we survey firms that recruit on any college campus, not just the college campuses specified in Study 1. In 2002, we secured a mailing list from a national recruiting organization and contacted its 1661 members who represented 1309 organizations. Respondents were offered the opportunity to complete paper-based surveys or internet-based surveys on their preferences and recruitment activities. From this survey, we received 209 usable responses (12.5 percent). In 2009, we employed a survey research firm to collect additional data on IT recruitment practices. The survey was sent to representatives of 600 firms who indicated they were involved in IT recruitment. From this survey, we received 203 (33.8 percent) usable responses. Table 1 provides firm characteristics.

Measures

Firm level measures are presented in Appendix B.

IT Orientation

Respondents were coded into one of three categories – IT consultant, IT vendor, and in-house IT. Coding was based on responses to three questions. First, respondents indicated their firm's industry classification. Second, respondents indicated their business unit. Finally, respondents indicated whether they were answering questions based on their recruitment of entry-level IT job seekers for their entire company or for their business unit. 118 firms reported they were involved in creating new information technologies and were coded as IT vendors. 58 firms reported their primary emphasis was IT consulting and were coded as IT consultants. 236 firms reported they were involved in industries that emphasized using IT to enable production or the transfer of information and were coded in-house.

Job Seeker Characteristics

Job seeker characteristics were measured using a 21-item scale (NACE, 2000). This scale was modified to add five generic IT skills: (1) programming skills, (2) database development, (3) systems analysis and design, (4) network administration, and (5) overall computer literacy. Items were anchored by 1 = not important, 3 = average importance, and 5 = extremely important.

Recruitment Channels

Recruitment channels were measured using 12 items. Items directed attention to the recruitment channels used by firms, such as campus recruiting or employment services. Items were coded 1 = not used at all, 3 = used on an occasional basis, 5 = used for almost every position we fill. These items were aggregated from diverse sources in HRM and IS literature [Agarwal and Ferratt, 1999; Barber et al., 1999; Breaugh, 1992; Breaugh and Starke, 2000].

Firm Size

Respondents were asked to indicate how large the firm was in terms of total employees, as firm size is a known covariate of recruitment activities [Barber et al., 1999].

Hypothesis 3 Firms and Preferences for Job Seeker Characteristics

Factor Analysis

We used an EFA with a varimax rotation to assess the dimensionality of preferences for job seeker characteristics. Based on the factor loadings and cross-loadings, several items were dropped from the analysis. A second factor

analysis yielded item loadings sufficient for moving forward with the analysis (see Table 10). To determine the number of factors, we assessed dimensionality of the data using the Kaiser Rule and examined the percentage of variance explained by each factor. Seven factors accounted for 67 percent of the total variance in the data.

To evaluate the strength of our EFA results, we used LISREL 8.8 to estimate CFAs. The first CFA estimated a one-factor solution. CFA results suggested a one-factor solution was a poor fit with the data (NFI = 0.84, CFI = 0.86, AGFI = 0.74, RMSEA = 0.21. The second CFA estimated a seven-factor solution, and provided evidence of a strong fit to the data (NFI = 0.94, CFI = 0.96, AGFI = 0.82, RMSEA 0.11). Given the EFA and CFA results, we carefully inspected the literature [Agarwal and Ferratt, 1999, 2001; Barber, 1998; Barber et al., 1999; Zwieg et al., 2006] and assigned the dimensions the following labels: (1) teamwork skills, (2) IT skills, (3) interpersonal skills, (4) work ethic, (5) creativity and achievement, (6) degree and (7) leadership skills.

Table 10: Firm Preferences for Job Seeker Characteristics								
Factor	Activity	Factor Loading						
		1	2	3	4	5	6	7
1. Teamwork Skills	Teamwork Skills	**0.84**	-0.08	-0.22	-0.17	-0.11	-0.04	-0.20
	Motivation/Initiative	**0.82**	-0.03	-0.23	-0.44	-0.24	0.18	-0.37
	Communication Skills	**0.70**	0.05	-0.26	-0.34	-0.25	0.13	-0.15
	Flexibility/Adaptability	**0.66**	-0.20	-0.14	-0.49	-0.24	0.43	-0.33
2. IT Skills	Database Development	-0.02	**0.87**	0.05	-0.13	-0.10	0.03	-0.15
	Systems Analysis and Design	-0.01	**0.78**	-0.07	0.00	-0.12	0.19	-0.01
	Programming Skills	-0.09	**0.71**	0.22	-0.19	-0.04	0.31	-0.14
	Network Administration	0.09	**0.50**	-0.29	-0.22	-0.27	-0.19	0.27
3. Interpersonal Sills	Tactfulness	0.35	-0.04	**-0.83**	-0.33	-0.28	0.01	-0.26
	Friendly/Outgoing Personality	0.26	0.00	**-0.81**	-0.26	-0.39	-0.02	-0.33
	Well Mannered/Polite	0.40	0.01	**-0.81**	-0.47	-0.30	0.01	-0.17
4. Work Ethic	Detail Oriented	0.24	0.16	-0.18	**-0.88**	-0.18	0.12	-0.03
	Organized	0.31	0.06	-0.33	**-0.85**	-0.21	0.01	-0.28
	Strong Work Ethic	0.48	0.08	-0.34	**-0.67**	-0.18	0.01	-0.21
	Analytical Skills	0.55	-0.01	-0.03	**-0.55**	-0.28	0.47	-0.39
5. Creativity and Achievement	Entrepreneurial Skills/Risk Taker	0.34	0.17	-0.11	-0.25	**-0.84**	-0.05	-0.20
	Need for Advancement	0.00	0.07	-0.44	-0.04	**-0.76**	0.15	-0.34
	Sense of Humor	0.17	0.04	-0.61	-0.14	**-0.76**	0.11	-0.02
	Creative	0.28	0.08	-0.29	-0.39	**-0.65**	-0.36	-0.28
6. Degree	Academic Major	0.09	0.27	-0.03	-0.09	-0.02	**0.78**	-0.03
7. Leadership Skills	Leadership Skills	0.39	0.14	-0.32	-0.23	-0.24	-0.07	**-0.77**
	Defined Career Goals	0.20	0.23	-0.30	-0.26	-0.42	0.13	**-0.70**
	Self-Confidence	0.56	-0.23	-0.35	-0.45	-0.32	0.13	**-0.58**
Eigenvalues		6.54	2.32	1.91	1.46	1.20	1.08	1.04
% of Variance		28.4	10.1	8.31	6.36	5.24	4.70	4.51

MANCOVA

To determine whether job seekers' typology of IT orientation were reflected in firms' preferences, we used MANCOVA to probe whether the seven dimensions identified in the EFA related to firms' IT orientation. We controlled for firm size by using it as a covariate. Because group sizes were not equal, we used Levene's Test of the Equality of Error Variances. For each dependent variable, the F-statistic suggested a "fail to reject" decision, suggesting that MANCOVA's assumptions were met.

MANCOVA was used to examine whether differences in preferences for job seeker characteristics vary across groups of firms. MANCOVA results suggest that different types of firms share preferences for job seekers' characteristics. Analysis suggests that IT orientation does not influence firms' preferences for job seekers' characteristics (λ = .817 F-test = 1.517, hypothesis df = 14, error df = 384, p = n.s., η^2 = .10, α = .70). Because the multivariate test does not suggest significant differences across groups of firms, we did not proceed with univariate tests or pairwise comparisons across groups.

Hypothesis 4 Firms and Recruitment Activities

Factor Analysis

We used an EFA with a varimax rotation to assess the dimensionality of recruitment activities [Harman, 1967]. Based on the item loadings and cross loadings, two items were dropped from the analysis. Inspection of the eigenvalues for the second analysis suggests that the items load on two distinct dimensions that accounted for 64.9

percent of the total variance in the data. The dimensions are comprised of formal channels, such as campus recruiting and employment services, and informal channels, such as walk-ins or personal networks. However, the percentage of variance explained suggests that a three-factor solution might provide a reasonable explanation for variance in the data. Although the eigenvalue is less than 1, the third factor explains 7 percent of the variance in the data. Table 7 presents EFA results. To confirm the EFA results, we estimated three CFAs—a one-factor, two-factor, and three-factor solution. The one-factor solution was a poor fit with the data (NFI = 0.86, CFI = 0.88, AGFI = 0.74, RMSEA = 0.20). The three-factor solution (NFI = 0.95, CFI = 0.97, AGFI = 0.84, RMSEA 0.09) provided evidence of a stronger fit to the data than the two-factor solution (NFI = 0.86, CFI = 0.88, AGFI = 0.73, RMSEA 0.20). Because the three-factor solution offered a richer description of recruitment activities and yielded a stronger fit to the data, we labeled the dimensions informal recruitment, college recruitment, and employment sources.

Table 11: Firm Recruitment Activities Factor Analysis				
Factor	Activity	Factor Loading		
		1	2	3
1. Informal Channels	Employee Referrals	**0.88**	0.09	-0.02
	Personal Contacts and Networking	**0.81**	0.10	0.00
	Walk-ins/Unsolicited Applications	**0.78**	0.08	-0.11
	Internet	**0.70**	-0.08	0.30
2. College Recruitment	Campus Visits	-0.07	**0.96**	-0.04
	Job fairs/Career Days	0.05	**0.88**	0.04
	Interns/Co-ops/Part-time Employment	0.22	**0.67**	0.10
3. Employment Services	Private Employment Services	-0.05	0.04	**0.85**
	State Employment Services	-0.09	0.14	**0.83**
	Temporary Agencies	0.28	-0.08	**0.66**
Eigenvalue		6.10	1.57	0.93
% Variance Explained		50.85	13.11	7.23

MANCOVA

Having assessed the dimensionality of recruitment activities, we used MANCOVA to test Hypothesis 4. First, we used Levene's Test of the Equality of Error Variances and determined that MANCOVA assumptions were met (e.g., F-statistics resulted in a "fail to reject" decision for each dependent variable). Next, we ran a MANCOVA using IT orientation as an independent variable and firm size as a covariate. We examined the Wilks' λs to determine whether differences exist across groups of IT job seekers. IT orientation's Wilks' λ is not significant (.94; F-test = 1.11, hypothesis df = 6, error df = 391, p = n.s., η^2 = .03, α = .43). Results suggest that a firm's IT orientation does not influence its IT recruitment practices. Because the multivariate test does not indicate that significant differences exist, we did not conduct univariate tests or examine parameter estimates across groups of firms.

The analyses conducted in study 2 failed to identify significant differences in firm preferences or recruitment activities when segmented based on IT orientation. However, the results do provide evidence of the applicant characteristics that firms in our sample seek, as well as the primary channels through which firms conduct recruitment activities. Results suggest that firms in all three segments place the highest emphasis on interpersonal skills, followed by work ethic and IT skills. Results also show that firms conduct primarily college recruitment activities, followed by informal hiring practices, and they place relatively little emphasis on employment services.

V. FULL STUDY RESULTS

We conducted two related studies on the IT job market. First, we looked at entry-level IT job seekers. These entry-level job seekers were college seniors who were in the process of searching for IT work. Results from this study suggest that there are distinct segments of the entry-level IT labor market. These segments are distinct in a couple of ways. First, we found that IT job seekers in different segments favored different work and firm characteristics. This finding suggests that the IT personnel in the entry-level market can be recruited more effectively by *sending appropriate signals*. Second, we found that IT job seekers in different segments engaged in different job search activities. This finding suggests that firms can reach these IT recruits more effectively by *selecting appropriate channels*.

The second study addressed the personnel preferences and recruitment activities of firms in the IT labor market. We studied whether the organizational side of the IT labor market could be meaningfully segmented based on IT job seeker perceptions. Our findings suggest that firms in the IT labor market do not vary their preferences for IT recruit characteristics based on their IT orientation. Thus, IT recruits searching for work should highlight the same set of skills regardless of their desire for firm IT orientation. Also, our findings suggest that firms in different market segments do not engage in distinct recruitment activities. In spite of distinct search activities by IT recruits in the

labor market, firms do not capitalize on this distinction by varying their recruiting accordingly. Taken together, these studies provide a perspective on both sides of the IT labor market.

VI. DISCUSSION

Rooted in image theory and signaling theory, our findings offer insights into the manner in which IT job seekers perceive different types of IT organizations. Drawing on image theory, Study 1 furthers our understanding of how entry-level IT job seeker images of firms segments them into groups and ties these groups to their job search behavior. Our findings suggest that IT job seekers possess distinct images of the attributes of different IT firms. Moreover, consistent with signaling theory, our analysis indicates that IT job seekers identify with three distinct market segments defined by preferences for perceived firm IT orientation. We found that each segment of IT job seekers has different preferences for job and firm characteristics. Further, job seekers in different segments report significantly different levels of preparatory job search behavior. Study 2 examines whether IT orientation can also be used to segment firms into groups with preferences for applicant characteristics and recruitment activities. Contrary to IT job seekers' images, our analysis suggests that firms prioritize IT applicants according to a common standard and use similar activities to attract entry-level IT job applicants. Importantly, our findings suggest that firms' difficulty recruiting entry level IT workers may result from a lack of understanding of the preferences and search behaviors of segments or groups of IT job seekers. Consequently, signaling theory suggests that if firms more effectively target specific segments of the entry-level IT workforce, that they may tap into pools of applicants who want to work for them and may realize a stronger employee-employer fit over time. In the following paragraphs, we provide a more detailed discussion of our results and their implications.

Study 1 Results: IT Job Seekers

Our findings illuminate key drivers of entry-level IT job seekers' attraction to firms. While Study 1 underscores the notion that entry-level IT job seekers share basic concerns about benefits, organizational culture, location and training [Goles, 2001; Hunsinger and Smith, 2008; McLean, Smits, and Tanner, 1996], it also provides evidence that groups of job seekers value job security, prestige, and the nature of work at different levels. Our findings suggest that IT job seekers view a trade-off between the relatively monotonous, unglamorous nature of in-house IT work and the relatively high level of job security and stability it provides. Job seekers who prefer in-house IT work express significantly less emphasis on the nature of the work and prestige than those who prefer the IT-oriented segments. However, this in-house segment valued job security significantly more than their counterparts in the IT consulting segment. This finding suggests that in-house IT job seekers may be willing to "trade" varied or prestigious work for a job that offers stability and security. Particularly in an uncertain economic climate such as when we collected data (2001-2002 and 2008-2009), non-IT-oriented firms may be able to leverage the in-house workforce segment's attraction to job security as a means to generate deeper pools of top IT recruits.

Consistent with image theory, our findings confirm that firm image and reputation influence IT job seekers' attraction different types of firms. We found that perceptions of the nature of work differed between job seekers in IT-oriented and non-IT oriented market segments. Respondents in the IT consulting segment reported significantly higher preferences for prestige and the nature of the work than members of the in-house segment. Our interviews suggested that entry-level IT job seekers perceive work in an IT consulting firm as consisting of many unique situations and opportunities for problem solving. However, this 'prestigious', 'varied' work comes at a price, as entry-level IT interviewees viewed IT consulting as offering less job security. Consistent with this view, members of the IT consulting market segment placed significantly less emphasis on job security than the in-house segment. Also, although respondents in the IT consulting segment were less concerned with job security than other groups, they still reported relatively high interest in secure jobs. Therefore, our findings suggest that recruiters with IT consulting firms may attract more applicants by emphasizing the 'prestigious' and varied work engaged in by their employees and to emphasize firm policies or history that project the image of job security in recruitment materials. Our research illustrates how image theory can be employed to understand entry level IT job seekers views of firms. Given that this lens has not been employed to examine the broad IT workforce, future research is necessary to understand how experienced IT workers form, and apply images, of prospective employers when searching for jobs.

Also, as suggested by signaling theory, our findings suggest that IT job seekers in different market segments manifest unique sets of job search behavior. Findings also suggest that IT job seekers in the IT consulting segment are the most aggressive job seekers, implying that firms in the IT consulting segment may need to engage in less active recruitment processes in order to garner job applicants. IT consulting firms may be able to put less effort into college recruitment and take advantage of the fact that entry-level IT job seekers seem to aggressively pursue IT consulting work. IT job seekers in the IT vendor segment significantly differ from those in the in-house segment in the level at which they value the nature of the work and prestige. Our data indicates that the IT vendor market segment values prestige and the nature of the work more than the in-house IT segment. However, unlike the IT consulting segment, the IT vendor segment does not value job security to a significantly lesser extent than the in-

house IT segment. This finding suggests that job seekers perceive IT vendor work as offering the opportunity to be creative and autonomous in developing important projects; but they are not willing to accept more risk and less job security in exchange for the prestige.

Our investigation of entry-level IT job seeker segments suggests that IT job seekers primarily distinguish between IT-oriented and non-IT oriented firms. The IT consulting and IT vendor job seeker segments did not report significantly different preferences regarding firm attributes or job characteristics. Therefore, although we examined a more nuanced view of IT orientation, our results suggest that IT job seekers primarily perceive differences in employers in terms of the intensity with which they develop and implement IT, not necessarily whether they focus on developing new products or aid in the implementation of products.

Collectively, these results are consistent with our understanding of image theory and signaling theory. First, concerning image theory, we find that respondents did maintain different preferences and engaged in different job search behavior based on their preferred type of employer. Results suggest that IT job seekers who desire different goals, in terms of IT employer type, engage in different sets of behaviors in order to achieve that desired goal. This outcome is consistent with basic concepts of image theory.

While our study affirms basic insights of image theory, our findings do not speak to how college students' views of different types of firms change over the course of their academic and professional careers [Smits et al., 1993]. For example, we suspect that college students' images of IT jobs and employing organizations may evolve over the course of their training programs. An entering student may have very different views of the complexities of IT work, the requirements of IT jobs, and the advancement potential of IT careers than a more advanced student. Their views of IT jobs might evolve as they acquire experience through vicarious experience gleaned from coursework or applied experience gained from intern programs. In future research, it would be interesting for researchers to conduct mixed-methods research that probes sources of changes in entry-level IT job seekers' images of potential jobs and employers.

It is important to note that our findings deviate from signaling theory in one important regard—there is a mismatch between how IT job seekers and IT employers share information. Signaling theory suggests that job seekers and employers that use the same channels to share information will find an optimal match in terms of person-job and person-employer fit. In order to do so, signaling theory suggests that job seekers and employers within distinct market segments will use different communication channels. Our research finds support for this suggestion among job seekers. On the job seeker side, we find that IT recruits are varying their job search efforts based on the type of job they hope to find. In terms of signaling theory, these IT job seekers select a message channel based on the type of employer they seek. On the organizational side, though, we did not find support for recruiting firms using different channels to share information with recruits. Specifically, we found that firms used the same tools to attract applicants, regardless of their IT orientation. This suggests that there is significant room for improved efficiencies in IT labor markets, in terms of how information is exchanged between firms and job seekers. Firms recruiting IT personnel may develop more effective recruiting practices if they tailor their recruitment activities to the channels used by the corresponding group of job seekers based on their IT orientation. We explore specific, practical implications of this observation in the next section.

Study 2 Results: Recruiting Organization

Study 2 findings suggest that segmenting firms based on IT job seekers' images of IT orientation does not provide insight into differences in firm preferences for applicant characteristics or recruitment activities. Although analysis does not indicate that differences exist at the firm level, findings yield valuable insight for IT job seekers and IT educators about how firms view job seekers. Consistent with recent IT recruitment research, each segment valued interpersonal soft skills, such as teamwork and communication, as well as technical skills [Goles, Hawk, and Kaiser, 2008; Turner, Lowry, and Fisher, 2005]. This finding may indicate that individuals' communication skills and personalities are considered important in the context of project-oriented IT work [Gorla and Lam, 2004]. To ensure the success of project teams, firms emphasize recruiting IT workers who can effectively communicate with peers as well as successfully engage in technical work [Pendharkar and Rodger, 2009]. For IT educators, this suggests that curriculum recommendations, such as those forwarded by the Association for Information systems (see Topi et al., 2008), that focus on developing balanced skill sets for Information Systems focused majors, within and outside of business schools are particularly important to consider when updating degree programs.

It is interesting to note that firms distinguish between teamwork skills and manners when identifying important applicant characteristics. This finding suggests that recruiters recognize that being well-mannered and being a good team player are different propositions. Well-mannered IT employees may improve the IT function's relationship with end users and consequently increase the likelihood of acceptance in the workplace of new technologies. Beyond being well-socialized, recruiters recognize that participating in and managing IT projects requires more specific

teamwork skills than simply interacting with end-users. For IT educators, this finding implies that we need to direct our attention to developing projects or extracurricular activities that improve the social skills of our students. For example, through sponsoring student groups such as the AIS student chapter movement or competitions such as Microsoft's Imagine Cup, faculty may offer students opportunities to acquire the social intelligence necessary to navigate the social dynamics within and outside of the IT function in organizations. In addition, it suggests that IT educators could be well-served to engage with industry and develop activities such as speaker series or intern/coop programs that provide students with insight into the social and teamwork skills necessary to succeed in practice.

We find that firms value IT recruits' work ethic. Completing IS projects on time is of major concern to practitioners and managers [Moore and Burke, 2004]. The emphasis on work ethic suggests that managers may be screening applicants based on perceptions of their attention to detail, organization, effort, and willingness to take accountability [Keil, Smith, Pawlowski, and Leigh, 2004]. Although HR and IT staffing strategies are sometimes disconnected [Schwarzkopf et al., 2004], this finding suggests recruiters are aware of the importance of carefully selecting IT employees who are predisposed to make careful decisions and invest time in completing projects. Through careful selection of IT personnel, managers may seek to mitigate risks associated with costly IT investments. Because IS has historically been a field with weak professional norms [Thatcher and Stepina, 2001], it suggests a need for educators and professional organizations to foster norms for IT professionals behavior that are readily communicated.

Despite finding that firms' recruitment practices due not vary with IT orientation, Study 2 furthers our understanding of activities used to attract entry-level IT job seekers (see Table 12).

Table 12: Firm Recruitment Activities			
Factor	Activity	Mean	Std. Dev.
1. Informal Channels	Employee Referrals	3.03	1.54
	Personal Contacts and Networking	3.30	1.72
	Walk-ins/Unsolicited Applications	1.82	1.25
	Internet	2.86	1.63
2. College Recruitment	Campus Visits	2.64	1.72
	Job fairs/Career Days	2.94	1.64
	Interns/Co-ops/Part-time Employment	2.74	1.58
3. Employment Services	Private Employment Services	1.44	1.04
	State Employment Services	1.48	1.14
	Temporary Agencies	1.37	0.96

First, firms report substantially higher use of recruitment channels, like campus visits and job fairs, as compared to public or private employment services. Firms report the highest use of college recruitment channels, such as campus visits, job fairs, and internships, for recruiting entry-level IT workers. This finding suggests that entry-level IT job seekers should leverage these recruitment channels while they are available. While this is an may seem like an obvious implication for job seekers, it is important that IT educators communicate this finding to their students. Practitioner reports suggest that many job seekers fail to take advantage of opportunities afforded by campus placement centers and may take six months or more to secure employment after graduation [NACE, 2011; Petrecca, 2010]. Moreover, it also suggests that firms who pro-actively use their time on campus to visit classes, develop relationships with student organizations, and other ways to differentiate their recruitment activities from their competitors may have the potential to generate deeper pools of applicants for IT jobs.

Second, firms report the second-highest mean value for using informal channels such as employee referrals or networking as a means to attract college students, suggesting that entry-level IT job seekers who do not have access to college recruitment channels should search via these informal channels. For IT job seekers, this suggests it is important to take advantage of social networking opportunities external to their institution. For example, IT job seekers can develop social contracts through participation in local professional chapters of the American Information Technology Professionals (AITP), Project Management Institute (PMI), or the Association for Computing Machinery (ACM). Alternatively, through aggressively pursuing internships and part-time job opportunities while still in school, students may make contacts in firms that demonstrate their preferred IT orientation. For IT educators, this underscores the importance of encouraging our students to engage with the world external to campus as a means to develop contacts that can lead to full-time employment after graduation.

Finally, findings support the notion that college recruitment and the use of employment services are distinctly different IT recruitment activities. Although employment services and college recruitment are formal mechanisms for attracting job seekers, findings suggest that firms place greater emphasis on college recruitment as a channel to

signal potential IT employees. These findings suggest that college recruitment is an important tool firms use to attract entry-level IT job seekers. Entry-level IT job seekers should take full advantage of these recruitment channels while they are available. Also, entry-level IT job seekers who do not have access to these channels may need to invest more effort to find jobs through informal channels or placement services, as these recruitment channels may be utilized less by IT employers.

VII. LIMITATIONS

It is important to acknowledge limitations of the study. The primary limitation is the sampling techniques. In terms of job seekers, data were collected from graduating college seniors within the United States. These students were enrolled at institutions who primarily teach students softer skills necessary to work in IT services positions (e.g., systems analysts, project managers etc.). As a result, it is not surprising that our population of subjects was most interested in working consulting firms. Also, this study examined only entry-level IT job seekers in the first stage of the job search processes. In order to gain a more complete understanding of IT labor markets, this study's findings should be replicated across countries, IT-related academic disciplines, universities, and among more experienced IT job seekers. Moreover, they should be extended to examine whether students actually find jobs in firms that reflect their preferred IT orientation and if they find a good "fit" with their employing organizations. Hence, while we collected data across time and universities, we believe it is important for future research to further probe the boundary conditions of our findings' applicability.

A potential criticism of this research is that we did not include in our analysis job seekers' core self-evaluations of IT skill. One could argue that job seekers interested in non-IT oriented firms segment preferred this group of firms because they were less technically apt. To address this concern, we ran a MANCOVA that included an interaction term for GPA and preferred IT orientation. Given that our IT job seekers studied information systems, our logic was that GPA served as a useful surrogate for IT skill. Our additional analysis did not detect a significant interaction between preferences for IT orientation and GPA. Nonetheless, future research could investigate whether competence in specific IT skills relates to job seekers' preferences for types of IT employers.

An additional concern about our study could be that we investigated IT orientation and recruitment from the entry-level IT job seekers' point of view. To further evaluate our typology's validity, we asked respondents to our second survey on recruitment practices to assess the accuracy of our typology of IT job seekers' images of IT employers. 172 of 209 (82 percent) respondents indicated that IT job seekers viewed IT employers as falling into one of our basic three categories. If respondents disagreed, they were asked to indicate alternative categories. The majority of open responses related to either third-party service providers or specific in-house IT positions. Given this supplemental evidence that supports our typology of job seekers' images, we believe it would be useful for future research to further probe whether this typology is germane to understanding labor markets of experienced IT workers.

Finally, it is important to note that it job seekers and it employers surveyed in this study do not necessarily interact during the extensive search phase of the it recruitment process. Although some firms recruit from the student sample research sites, firms are from diverse regions. However, prior research suggests that firms' college recruitment practices are not significantly different across regions or college campuses in the united states (barber et al., 1999). Hence, although actors may not interact, prior research suggests that firms employ similar college recruitment practices across regions in the united states to attract job seekers.

Implications for Research

For IT recruitment research, this study highlights the importance of studying segments within IT labor markets. Prior IT research suggests that firm IT recruitment practices should emphasize incentives like salary or advancement opportunities (see, for example, Goles, 2001; Hunsinger and Smith, 2008; McLean et al., 1996). Our findings, however, provide initial evidence that job seeker preferences and behaviors vary with their preferences regarding employers' IT orientation. Although variance explained by IT orientation was relatively small, we found that different segments of the entry-level IT workforce emphasize different factors like prestige and the nature of work. By controlling for IT job seekers' preferences for IT orientation, our findings suggest that researchers may develop a more refined understanding of recruitment practices that attract deeper pools of applicants to IT employers or specific types of IT jobs. Because person-job and person-organization fit do not always covary, a potentially useful direction for future research could be to examine IT job seeker preferences for specific positions (e.g., systems analyst, programmer etc.) within segments of the IT workforce [Kristof-Brown, Zimmerman, and Johnson, 2005]. For example, one could examine whether a factor such as social rewards covaried with preferences for type of job within segments of entry-level IT job seekers. By doing so, IS researchers may investigate potential differences between characteristics IT job seekers associate with specific jobs while controlling for images associated with types of firms.

Although we provide evidence of segments within the entry-level IT labor market based on job seeker images of IT orientation, our findings suggest that we cannot meaningfully segment the IT employer market into corresponding segments. One implication of our findings is that entry-level job seekers may not understand the preferences or nature of IT employers. Despite their education, our findings suggest that IT job seekers possess a relatively unsophisticated view of potential employers. For research, this suggests that opportunities exist to identify interventions or programs that may foster more realistic perceptions of IT employers in the minds of job seekers. For example, because IT jobs require diverse skill sets, involve role conflict, and require lifelong learning, IT researchers may need to develop novel and innovative approaches to help students understand the nature of IT work. By establishing how to set realistic expectations for IT jobs, studies may inform IT job seekers of how to identify potential employers that better fit their preferences. This is important for employers and job seekers, because HRM research suggests that realistic job previews are an important source of long-term satisfaction with an employing organization [Hom et al., 2006].

Future research is necessary to examine sources of variance in preferences and how they change over time. For example, it would be useful to examine whether training in different IT-related academic disciplines influences job seeker preferences for preferred employer's IT orientation, firm and job characteristics, and job search behavior. For example, by examining whether differences exist in students' preferences among core disciplines such as computer science, computer engineering, information systems, and information science, scholars may inform IT recruiters understand of how to effectively convey information about their firms to job seekers. Also, longitudinal research should investigate how job seeker perceptions of firms change during the phases of the recruitment process. For example, prior research has found that recruiter behavior can influence job seeker attraction to firms in the early stages of their job search [Rynes and Miller, 1983]. It would be interesting to examine whether a consistent presence on a college campus can shape job seeker perceptions of the work offered by different types of firms. Studies examining such topics are important, because as IT educators faculty have a responsibility to not only provide student opportunities to acquire skills but also to prepare them for the job market. Moreover, such research speaks directly to the concerns of the practicing IT professional, who are important stakeholders for the IS research community.

Similarly, future research should consider the impact of internships on the preferences and search behaviors of entry-level IT workers. Students given access to internship opportunities may have more specific preferences or engage in different search behaviors as a result of these experiences. Also, these students may leverage professional connections and experiences from the internship when searching for work, or simply transition into full-time work at the same firm. In addition, future work should evaluate the impact of IT job seekers personal and professional social networks. Job seekers with extensive social networks may be more inclined to leverage these networks in pursuit of work. Furthermore, entry-level IT job seekers may be influenced by the experiences of other IT professionals in their social network. From such informal connections, new IT professionals may be oriented toward, or away from, certain types of work opportunities. For example, a graduating senior might hear about the interesting challenges faced by an IT consultant or the irritations of serving as in-house technical support. Research including internship experiences and social networks would deepen our understanding of the IT recruitment process.

Finally, we found that IT job seekers are primarily segmented based on perceptions of IT-oriented versus non-IT oriented firms. Although IT plays many different roles in organizations, this finding suggests that IT job seekers focus on high level images, as opposed to more nuanced images, of IT roles in firms as they begin their job searches. Because many employers seek applicants for a variety of IT jobs (e.g., help desk, systems analysts, etc.) that differ in their demands for IT knowledge and skills, our findings suggest a need for research that examines how to design recruitment materials and activities that encourage job seekers to distinguish between firm characteristics and IT job characteristics. By developing an understanding of how to design IT recruitment activities that send clear signals about the nature of a job, IT research may inform the development of more effective recruitment practices.

Implications for Practice

This study has three important implications for entry-level IT job seekers and their potential employers. First, although soft skills are important, entry-level IT job seekers should keep in mind that, in spite of the apparent trend towards soft skills, firms appear to still prioritize technical over interpersonal skills in hiring decisions. Firms consistently noted that they desire applicants with specific sets of technical skills (i.e., the ability to program, work with databases, and participate in systems analysis and design). This finding is consistent with recent IT recruitment research on job advertisements [Gallivan et al., 2004] and IT skills that found firms technical skills are at the forefront of many IT employers' requirements for new hires [Surakka, 2007]. For job seekers, then, it is important to cultivate a strong set of technical skills in order to earn interviews and the opportunity to demonstrate the interpersonal skills necessary for securing an IT job.

Second, our findings provide entry-level IT job seekers useful information on how to find a job. If seeking entry-level IT jobs, our findings suggest that job seekers would be well-served to leverage college recruitment centers and career fairs early in their job search. Firms reported college recruitment as the most preferred channel used to hire entry-level IT employees. If unable to secure pre-graduation employment, our findings direct IT job seekers' attention to developing social networks and making informal contact with employers through these social channels, rather than relying private or public employment services, to find a job. For IT educators, this finding suggests that they need to emphasize to their students the importance of starting to look for work well before graduation.

Finally, our findings provide recruiters important information on how entry-level IT job seekers view opportunities afforded by IT employers. At a broad level, qualitative and quantitative data suggests that IT job seekers view firms through the lens of their "IT intensity." When recruiters develop materials, such as job listings and brochures, our results suggest that recruiters would be well-served to include content on IT's role in their organization. By doing so, recruitment materials may offer concrete information about IT jobs such as the degree of creative or interesting work offered by an employer. Also, findings show that compensation, location, training, and culture may attract the interest of entry-level IT job seekers [Hunsinger and Smith, 2008]. If a firm wishes to recruit job seekers from specific market segments, our findings provide specific direction on how to tailor the content of signals regarding the nature of work, company prestige or job security. Further, firms should consider disseminating information on potential job opportunities to college seniors early in the academic year. Our analysis indicates that the majority of job seekers engage in preparatory job search behavior well before graduating from college. By sending signals earlier, firm IT recruitment activities are more likely to reach a larger portion of the IT labor market and consequently attract more IT job seekers.

VIII. CONCLUSION

This study was motivated by a desire to achieve a deeper understanding of effective IT recruitment practices. Framed by signaling theory and image theory, our study found that job seekers in different IT job market segments have distinct preferences for firm and job characteristics as well as engage in different levels of job search activities. While we hypothesized that firms of different IT orientations would value and search for recruits differently, we did not find evidence to support our hypotheses. These findings suggest that while there are distinct segments of IT workers who value and search for IT jobs in different ways, firms of all IT orientations value the same types of workers and use similar tools to attract new IT recruits. To realize a competitive advantage in IT recruiting, firms should consider customizing their recruitment materials to the preferences of groups of job seekers who prefer their type of firms as well as employ recruitment channels most frequently used by potential recruits. By taking into account our findings, firms and IT job seekers may become better equipped to effectively manage the IT recruitment process.

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Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the article on the Web, can gain direct access to these linked references. Readers are warned, however, that:
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APPENDIX A: JOB SEEKER MEASURES

IT Orientation

Please rank your preferences for type of potential employers. (1 = first choice, 2 = second choice, 3 = third choice; Use each ranking only once.)

____ IT Vendors focus on creating new information technologies (like Adobe, Microsoft or Sun).
____ IT Consultants focus on helping other companies install and use information technologies (like Accenture).
____ In-house IT groups focus on the application of IT to enable other business processes within the same organization, such as production or delivery (like the IT department of a bank or manufacturing firm).

Do you perceive there to be other types of IT firms? If so, please use this space to describe the other types. Also, please tell us how you would rank all types of firms (including any that you describe here).

Job Search Activities (Blau, 1994)

How frequently have you engaged in each of the following activities during the last six months? *For each of these items, please circle the appropriate number, using the following scale:*
1 = *Never (0 times)*
2 = *Rarely (1 or 2 times)*
3 = *Occasionally (3 to 5 times)*
4 = *Frequently (6 to 9 times)*
5 = *Very frequently (at least 10 times)*

Table A–1: Job Search Activities		
Items	Mean	Std. Dev.
Contacted an employment agency, state employment, or campus placement service	1.88	1.02
Filled out a job application	2.52	1.32
Had a job interview with a prospective employer	2.13	1.19
Listed yourself as a job applicant in a newspaper, journal, or professional association publication[a]	1.47	0.86
Prepared/Revised your resume	3.13	1.49
Read a book or article about getting a job or changing jobs	2.18	1.07
Read the help wanted/classified ads in newspaper, journal, or professional association publication.	2.45	1.28
Sent out resumes to potential employers	2.90	1.44
Spoke with previous employers or business acquaintances about their knowledge of potential job leads.	2.33	1.13
Talked with friends or relatives about possible job leads	3.42	1.17
Telephoned a prospective employer	1.91	1.06
Used faculty (school) contacts to generate potential job leads	2.03	1.14
Used the Internet to look for potential job leads	3.36	1.35
[a] Dropped from analysis due to low loadings or high cross-loadings.		

Firm and Job Characteristics [Barber et al., 1999; Goles, 2001]

This set of questions deals with features of organizations that you prioritize when considering a job. For these questions, please circle the appropriate number, using the following scale:

1 =   not very important   3 =   somewhat important   5 =   extremely important

Table A–2: Firm and Job Characteristics		
Items	Mean	Std. Dev.
Autonomy/Responsibility/Challenge of Job	4.01	0.73
Benefits and perquisites	4.22	0.73
Close-knit work groups[a]	3.39	0.93
Company culture	3.89	0.86
Company image	3.83	0.90
Company size/age[a]	3.27	0.94
EEO/Diversity of employees[a]	2.88	1.19
Employment security	4.43	0.74
Frequency of relocation	3.67	1.11
Industry/Product image	3.78	0.86
Involvement in decision making	3.92	0.77
Location	3.87	1.00
Meaningfulness of work	4.30	0.79
Mentor program	3.35	1.02
Opportunities to develop new technology	3.51	1.04
Opportunities to work with technology[a]	3.86	1.02
Opportunity for promotion	4.68	2.36
Opportunity to make friends at work	3.71	0.97
Personal growth	4.44	0.69
Prestige in company	3.80	0.90
Profit sharing[a]	3.53	0.89
Qualified coworkers[a]	4.09	0.75
Starting salary	3.80	0.85
Supervision	3.25	0.92
Training opportunities	4.21	0.82
[a] Dropped from analysis due to low loadings or high cross-loadings.		

Self Esteem (Rosenberg, 1965)

Please indicate how strongly you agree or disagree with the statements below using the following scale:

1 = Strongly Disagree   2 = Somewhat Disagree   3 = Somewhat Agree   4 =Strongly Agree

Table A–3: Self Esteem		
Items	Mean	Std. Dev.
I feel that I am a person of worth, at least on an equal plane with others.	2.86	1.79
I feel that I have a number of good qualities.	2.47	1.23
All in all, I am inclined to feel that I am a failure.[a]	3.49	0.77
I am able to do things as well as most other people.	2.77	1.45
I feel I do not have much to be proud of.[a]	3.62	0.87
I take a positive attitude toward myself.	2.43	1.12
On the whole, I am satisfied with myself.	2.45	1.07
I wish I could have more respect for myself.[a]	3.22	1.05
I certainly feel useless at times.[a]	2.74	1.36
At times I think I am no good at all.[a]	3.44	0.98
[a] Reverse coded item.		

APPENDIX B: FIRM SURVEY ITEMS

Recruit Characteristics [NACE, 2000]

When recruiting for recent college graduates, what are important characteristics of potential information technology employees? *For each of the following items, please circle the appropriate number, using the following scale:* 1 = Not Important   3 = Average Importance   5 = Extremely Important

Table B–1: Recruit Characteristics		
Items	Mean	Std. Dev.
Academic major	3.71	0.97
Analytical skills[a]	3.36	0.69
Communication skills	4.43	0.67
Creative	3.54	0.77
Database development	3.57	0.91
Defined career goals	3.24	0.83
Detail oriented	4.12	0.76
Entrepreneurial skills/risk taker	3.17	0.98
Extracurricular activities[a]	2.71	0.92
Flexibility/adaptability	4.39	0.76
Friendly/outgoing personality	3.59	0.85
Integrity[a]	3.72	0.52
Leadership skills	3.71	0.81
Motivation/initiative	4.55	0.63
Need for advancement	2.97	0.83
Network administration	3.50	1.10
Organized	4.04	0.77
Overall computer literacy[a]	3.55	0.64
Programming skills	3.89	0.96
Self-confidence	4.01	0.81
Sense of humor	2.97	1.00
Strong work ethic	4.37	0.68
Systems analysis and design	3.74	0.91
Tactfulness	3.66	0.84
Teamwork skills	4.59	0.61
Well mannered/polite	3.69	0.80
[a] Dropped from analysis due to low factor loadings or high cross-loadings.		

Recruitment Activities

Recruitment activities were aggregated from several different sources in the HRM and MIS literature. We used the following stem and scale to collect the data.

To what extent are the following sources used to recruit recent college graduates for IT positions?

1 = Not used at all.   3 = Used on an occasional basis.   5 = Used for almost every position we fill.

Table B–2: Recruitment Activities		
Items	Mean	Std. Dev.
Advertising(newspapers, trade journals, etc.)[a]	2.12	1.44
Brochures and postings[a]	2.86	1.63
Campus visits	2.64	1.72
Employee referrals	3.03	1.54
Internet	3.30	1.72
Interns/co-ops/part-time employment	2.74	1.58
Job fairs/career days	2.94	1.64
Personal contacts and networking	2.80	1.47
Private employment services	1.44	1.04
State employment services	1.48	1.14
Temporary agencies	1.37	0.96
Walk-ins/unsolicited applications	1.82	1.25
[a] Dropped from analysis due to low factor loadings or high cross-loadings		

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