Strategies For Information Systems Candidates And Job Seekers In The Twenty-First Century Workplace

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ABSTRACT

Information system is a dynamic changing area since information technology changes rapidly. The technology advances trigger the challenge of how information and information technology can be used for strategic and competitive purpose (Waston et al., 1988). These developments demand that IS professionals be equipped with technology and management skills. These changes impact the job seeking process for IS graduates. Recently, the process of job search has attracted empirical scrutiny. This article is intent to analyze a variety of job search strategies' effect on employment outcome specialized in information system field. We will examine a variety of strategies and their correlation with employers' recruiting decisions. We intent to identify what kind of strategy will increase the possibility for the IT job seekers to be hired. Moreover, this article tries to identify the factors that contribute to the gap between the employed and the unemployed. The difference between this research and prior is that it uses qualitative method rather than a quantitative approach.

INFORMATION SYSTEM SKILLS AND REQUIREMENT

The association for information systems specifies the following area as IS research and teaching specification: Administration, accounting information systems, AI/expert systems, business applications, data management, decision support systems, electronic commerce, executive information systems, global information technology, group support systems, human factors, information security, IS strategy, information systems, knowledge management, management of IS, microcomputers/end-user computing, modeling and simulation, operating systems, organizational impacts, programming languages, software engineering, system analysis and design, technology and innovation, and telecommunications.

Lee, Trauth and Farwell (1995) pointed out the critical skills and knowledge requirements of IS professionals in their joint academic and industry investigation. They identified four broad categories of critical IS knowledge/skills:

- *Technical specialties knowledge/ skills.* The measure for IS technical knowledge included 18 items covering a range of IS technical specialties (e.g., operating systems, programming languages, database management systems, networks, telecommunication, etc.).
- *Technology management knowledge/ skills.* Technology management knowledge/skills are concerned with where and how to deploy information technologies effectively and profitably for meeting strategic business objectives. The measurements include: ability to learn new technologies; abilities to focus on technology as a means, not an end; ability to understand technological trends.
- *Business functional knowledge/ skills.* It emphasizes on applying information technologies to serve business goals and the need to reengineer business processes require IS professionals to possess in-depth business functional knowledge and skills. The requirements are: ability to learn about business functions; ability to interpret business problems and develop appropriate technical solutions; the ability to understand the business environment; and the knowledge of business function.

- *Interpersonal and management knowledge/ skills.* The measurements for the interpersonal skills are: ability to work cooperatively in a one-to-one and project team environment; ability to work closely with customers and maintain productive user or client relationship; ability to develop and deliver effective, informative, and persuasive presentations; ability to be sensitive to organizational culture/ policies and other measurements.

Todd, McKeen and Gallupe (1995) conducted similar research. They examined the degree to which the perception of changing knowledge and skill requirements are matched in job advertisements for programmers, systems analysts, and IS managers--over a 20-year period from 1970 to 1990. Table 1 presents their classification regarding changing knowledge and perceptions.

Table 1: Changing Knowledge and Perceptions

Class	Category	Description	ACM categories
Technical Knowledge	Hardware	Mainframe, mini, and personal computers. Other devices such as storage devices, controllers, printers, and other peripherals, plus networks.	Computers
	Software	Application systems, operating systems, packaged products, networking software and languages	
Business knowledge	Business	Functional expertise (such as finance, marketing) and industry expertise (such as retailing, mining)	Organization
	Management	General management skills including leadership, project management, planning, controlling, training and organization	
	Social	Interpersonal skills, communication skills, personal motivation and ability to work independently.	People, Society
System knowledge	Problem solving	Creative solutions, quantitative skills, analytical modeling, logical capabilities, deductive/inductive reasoning, innovation	Models
	Development methodology	Knowledge of systems development methodologies, systems approach, implementation issues, general development phases, documentation, and analysis/ design tools/techniques.	Systems
Source: Todd, Peter; McKeen, James; and Gallupe, R. Brent, The evolution of IS job skills: A content analysis of IS job advertisements from 1970 to 1990.			

More specifically, Hugh J. Watson pointed out the different priority technical skills set for a variety of IS professionals – programmers, system analyst and end-user report. For programmers, MIS professional perceived knowledge of applications programming language is the most essential skills for entry level programmers. Secondary requisite skills are systems analysis and design, problem solving, and related technical skills. As for systems analysts, systems analysis skills are regarded as most important skills requirement. Following systems analysis are business communication and interpersonal skills. While in terms of end-user support, business communication and interpersonal skills are viewed as top requisite skills. Knowledge of spreadsheets, graphics, word processing, and other PC package is also considered important for end-user support personnel.

The current trend for MIS hiring is that MIS positions are demanding business knowledge, communication, and interpersonal skills. The demand is now shifting toward hiring employees with the ability to communicate as well as to perform technical tasks. Technical skills alone are insufficient, as information plays an increasingly important role in business today (Waston et al., 1988)

Based on the above literature, Table 2 is developed to describe the information systems positions and related skills requirements:

Table 2: IS Skills and Positions

Skills Categories		Positions	Candidate must possess the knowledge of following
Technology	Programmer	Computer operator; Programmer; Help desk specialist; Software engineer; Hardware engineer	Application programming language; C++/Unix; Java/J2EE; Operating systems
	Database	Data mining specialist; Database administrator; Database designer; Data-warehouse designer	SQL; DBA; OLAP; Oracle; VB/VB.NET; ASP.NET; AJAX; XML; JavaScript; HTML, ASP and Front page; SAP
	Enterprise Architecture	ERP; E-commerce	SAP; Oracle.....
	Telecommunications	Network administrator; Network architect; Network engineer; Network installer; Telecomm Specialist	Installation of network; SDLC; PBX; Web server connection; Cisco; CNE; LAN/WAN; RF; TCP/IP; ISDN; Frame Relay; ADSL; VOIP; Hubs.....
	Web	Web developer; Webmaster	Java; CGI; CSS; HTML; PERL; SQL; E-commerce; ASP.Net; VB.Net
	Others	Technical recruiter; Technical recruiter consultant; Technical writer; Tester	TSO; PeopleSoft HRIS/HRMS 8.x; Computer repair; Documentation; C++; Java; JavaScript;
Business		Business Analyst; Business-to-Business marketer; Project manager; Quality assurance specialist; etc	Business process mapping; Gap process; Project management; Supply chain management; SQL: .NET framework including ASP.NET, VB.NET, C#.NET and Visual Studio; HTML; XML: XSLT; IIS and UML design; PowerBuilder, Informix 4GL, Informix DBMS: Business communications
System		Legacy system operator; Legacy system programmer; System administrator; System engineer; etc	System support and documentation; DBA; Linux and Unix; Infrastructure

Source: <http://activewin.4jobs.com/>.

JOB SEARCH METHODS AND ITS OUTCOMES

Facing the various employers' requirements, how can job candidates fully prepare themselves and challenge them? US department of labor provides the following methods for job searches:

- *Personal contacts:* Friends, family, neighbors, acquaintances, teachers, and former coworkers—are some of the most effective resources for job search. To develop new contacts, join student, community, or professional organizations.
- *School career planning and placement office:* Career services usually provide career counseling and job search advice such as resume writing, effective interviewing, and sponsor job fairs.
- *Employers:* Through library and Internet research, we can develop a list of potential employers in desired career field. Web sites and business directories can provide information on how to apply for a position or whom to contact. Directly contacting employers is one of the most successful means of job hunting.
- *Classified ads:* The "Help Wanted" ads in newspapers list numerous jobs. We should realize, however, that the classified ads sometimes do not give all of the important information.
- *Internet networks and resources:* The different types of sites that may be useful include general career advice sites, job search sites, company web sites, trade and professional association web sites, and forums.
- *Professional associations:* Many professions have associations that offer employment information.
- *Employment service:* Government, state employment service, labor union, career consultant and agencies (public and private) also provide valuable employment information.

In terms of their effectiveness, Lars Osberg's (1993) research indicated that the probability of an individual getting a job in a given period is a function of the effort used by the individual in all the search methods used. The conditions on these variables are (1) demographic and family characteristics, (2) education, (3) local labor market characteristics, (4) industry, (5) occupation of prior employment, and (6) employment history. His finding is that the application to employers and use of public employment agencies are the two most commonly methods and associated with a higher probability of job finding success. Others like personal contacts, placing ads, using union, or private employment agencies have had mixed success.

For college graduates, Mau, Wei-Cheng and Kopischke, Amie (2001) conducted a survey among them. They found that the students' common job search methods are: (1) sent out resume; (2) went to campus job replacement office; (3) looked through want ads; (4) asked friends/ family members/professors; (5) attended recruiting fairs; (6) did volunteer work in field; (7) looked at job boards in unemployment office; (8) contacted "head hunters," employment agency, professional recruiter; (9) placed own want ads, and (10) subscribed to trade journals. The result indicated that the use of resume is a primary job search method, and networking, want ads, job replacement offices are the secondary methods for job search. The research also shed light on the correlation between the number of job search methods used and the number of interviews, which encourage students to use a variety of job search methods rather than rely on a single method.

Holzer's (1988) analysis pointed out some other issues relevant to job search methods and outcomes. In Holzer's job search model, the choice of job search methods are related to their costs and expected productivities, as well as nonwage income. Search intensity has a positive and statistically significant effect on the probability of receiving an offer.

Researchers have pointed out some issues that can plague the effectiveness of a job search and sabotage it from the beginning; these can include:

- *Lack of investment* -- Job seekers are not willing to spend enough time and money on a professional resume, interview suit, and job search activities such as internet postings and recruiter contacts;
- *Poor Resume* -- A top-quality, professionally prepared resume is vital;
- *Lack of Organization* -- Job search is a project. It has objectives, stages, process, and strategy. Planning, keeping track of resume submissions, and making contacts – all this falls under job search planning. Very few job seekers go into their job searches with any kind of plan;
- *Poor Interviewing Skills* -- Most job seekers don't realize the importance of preparing well on the telephone;
- *Lack of Follow Up* -- The top technique a job seeker can do to influence the interviewer is to send a thank you note. About 99% of all job seekers don't do it. Statistics show that the 1% who do, enjoy an inordinate amount of success in being called for subsequent interviews.

RESEARCH MODEL: GAPS IN THE LITERATURE

Some studies point out the requirements for IS new hires. Some other researches shed light on the commonly efficient job search methods in job seeking process. However, there is very little attention to tutor college graduates to seek jobs specifically in Information systems fields. As information technology and the organizational needs bring out a variety of challenges to IS professionals, how can the IS graduates fully prepared to successfully meet the challenges? The objective of researchers should be to investigate the changing skills and the knowledge requirements of the IS graduates and to prepare them academically and practically. The research questions can include:

- What are the common skills set required for the IS hires?
- What are the efficient job search methods for the IS graduates?
- What are the reasons of failing to get the job?

Figure 1: Moderators of Getting a Job

We hypothesize that the probability of individual getting a job in a given period is influenced by the factors of individual information systems education and job search methods. The moderators on these variables are: demographic characteristic, individual characteristic, industry, job market, and search intensity. The research model is presented in Figure 1.

METHODOLOGY

For this study and to glean the ideas of practitioners in the field, the authors developed a questionnaire consisting of two parts and conducted three interviews with three information system directors working in information system field at Salt Lake city, Seattle, and Fort Lauderdale. Questionnaire Part I lists sixteen job search strategies, the interviewee is asked to mark the extent to how strongly she feels about the importance of the strategies; ranking each element from 1 to 5, from not effective to extremely effective. The IS job search strategies are as follows based on the research model:

- Obtain IT knowledge education and experience, such as attending technology certification school, achieving technology degree;
- Choose appropriate working location;
- Write resume;
- Prepare for interview;
- Networking: contact friends, family, professors;
- Attend career fair;
- Utilize Internet resources;
- Work on Internship;
- Apply for positions in the newspapers and trade magazines;
- Plan time ahead before graduation;
- Acquire knowledge of job market;
- Directly contact employers;
- Develop interpersonal and Communication skills;

- Follow up and follow through;
- Increase search intensity and search efforts.

Part II consists of the open-ended questions:

- What are your job duties?
- What kind of skills set you think is required for information system field?
- What elements or issues will you consider if it is upon you to select job candidates?
- How is the worker's performance comparing to the impression that he/she gave in the interview?
- What issues will make you reject to hire the candidates?
- For your friends who are successfully employed and unemployed, what issues contribute to the gap?
- Do you have any suggestions on how to develop IT job skills set? What do you think is very important?
- Any other recommendations you can offer to IT professionals?

DATA COLLECTION AND ANALYSIS

The interview results indicated that interviewees agreed that "obtain IT knowledge and experience," "prepare for interview," and "develop interpersonal and communication skills" are top priorities among all the strategies offered in the questionnaire. The second priority strategies are "utilize internet resource," "work on internship," "plan time before graduation," "acquire knowledge of job market," and "increase search intensity." The other strategies are ranked less important but are still very effective.

Question 1: Job Duties?

The interviewees are from different information system fields in different location in United State. They handle varieties of job duties in different fields. For example: develop and test software, provide tier-2 production support; design web based codes on software using ASP.NET, XML, HTML, Java script; or database design and query.

Question 2: What Skills Set Is Required For IT Jobs?

The interviewees answered that it depends on the types of IT jobs and working environment. Having a related degree will help. Generally speaking, the following skills are important: technical skills, learning skills, analytical skills, interpersonal skills, prioritizing skills, multi-tasking skills, management and planning skills.

Question 3: What Issues Do You Put Into Consideration When You Evaluate The Candidates?

- *Skills*: technical skills, logical and analytical skills, learning skills.
- *Responsibility*: if he/she will be responsible for the positions, willing to make effort to finish the assignment before deadline.
- *Confidence*: If the job candidates have sufficient knowledge about the questions, he/she will not only answer yes or no, he/she will keep probing and carry on the conversation on deeper or different aspects. During the conversation, the interviewer will be able to get into the person and develop interpersonal understanding.
- *Creativity*: When encountering the problems, instead of asking "boss, what could I do now," a creative worker will be able to provide the solution and see through the potential problems. He/she will be able to say "this action may cause problems"; "I have an alternative for it"; "do you think this will be a better solution," and so on.
- *Personality*: The ability to work in a team environment is important. Other elements can include how does he/she perform in difficult situation; or, is s/he detail-oriented, a self-starter, a hard worker, and a person with integrity?
- *Potential*: The candidate's willingness to learn and ability to grow.

Question 4: Does The Candidates' Later Performance Match The Interview Impression?

Performance does not always match interviewee perception. However, generally speaking, the interviewer could have a pretty good judgment of the candidates if the interview is well designed. One can use these impressions to judge people and interpersonal skills. Furthermore, one can use performance in previous jobs and technical knowledge to judge technical level and potential.

Question 5: What Issues Will You Use To Reject To Hire The Candidates?

- Inadequate technical skills. Somehow it can be offset by trainings.
- Bad personalities such as over confidence, stereotyping, not being a team player.
- No passion for work, no goals.
- Integrity or creditability problem.
- When there are better candidate with better experience or better personality.

Question 6: For The Acquaintances Who Are Successfully Employed And Unemployed, What Do You Think Contribute To The Gap?

- Most importantly, those who are successfully employed have the desire to win (motivation), even though they might have applied for more than 50 jobs. They are usually prepared, both in technical knowledge and interview skills. And they usually have their goals clearly set. Luck is important in bad job market.
- Those who are not successfully employed are often not very aggressive in seeking jobs. Perhaps they have no skill focus area or they don't care much about building up work experience. Often, they just want to find a good job right away without taking a part-time or low-paid job. They don't spend time to learn new things and improve their technical skills. When they work, they lack dedication and responsibility. The attitude of "just waiting for paycheck" will make them fail in their job eventually.

Question 7: Any Suggestions To Develop IT Job Skills Set?

- Knowledge and experience are vital for a good job. It is necessary to get an IT degree, even though it might be expensive and time consuming.
- Practice in the industry. Classroom knowledge is definitely not enough. If no related working experience, look for gaining any related work opportunity...even consider taking a volunteer job.
- Keep learning new technologies, read more technologies books if not very familiar with the IT area you want to apply for.
- Be strong in certain areas while have general wide knowledge too. IT jobs have a lot of different areas. Narrow your focus down to a few IT areas that you will apply for. This way you can better prepare yourself.
- Networking is very important. Build up your reputation and references in work.
- Constantly pay attention to open positions in career site such as careerbuilder.com and websites for local newspapers. Try to apply for at least five jobs each week.
- Search interview questions and answers on line to prepare for technical and general questions.
- Prepare a professional resume and cover letter templates. Try to send resumes with cover letter every time when applying for a position.

CONCLUSION

This paper discussed the common skills set, knowledge and experience required for IS graduates and implication for IS curriculum. Ashenhurst grouped IS requisite knowledge into six categories: (1) People; (2) models; (3) Systems; (4) Computers; (5) Organizations; and (5) Society. Students are encouraged to fully grasp the broad view of IS in a variety of aspects. Accordingly, he gave detailed description of course group:

- Course group A: Analysis of organizational systems;
- Course group B: background for systems development such as operations analysis and modeling; Course group C: computer and information technology;
- Course group D: development of information systems such as system design.

Meanwhile, we recommended that students should focus on the specific technology area and keep learning it by reading extra technical books and journals, attending related industry internship, and obtaining technology certificates. Because IT has wide areas, narrow their focus down and being strong in some specific areas will help to get a job.

Not only the technical skills, but also the soft skills such as communication skills, interpersonal skills, ability being a team player, responsibility and creativity demonstrated by the candidates are vital to the hiring decision. Employers are looking for a good fit between technology and the organization. Other recommendations are as follows:

- *Start early before graduation:* actively attend internship and conferences when possible. Make a strategic project plan for job searching. Constantly keep track of online career websites and newspapers. Make great effort to use internet resource and apply online.
- Research the job market: be familiar with the current job market trend and the salary range. Review the companies' website, annual report and other sources of information.
- Be well prepared for the interview: invest in professional suits, resume, and cover letter. Search for possible interview questions and answers online. Be ready for the phone interview. Follow up and follow through.

In IS field, technical skills are critical for entry and medium level engineer. Candidates with inadequate technical skills will not be considered in most cases. Nowadays, interpersonal, business, and organization skills are regarded a necessity, especially at management levels. Characteristics such as no clear goal, no plan, and no passion are the job search killers. Failure to professionally market oneself in resume and interview will result in lost opportunities. Even when one gets a job, failure to demonstrate dedication and not keeping pace with new technology will eventually get one out of game. All professionals are encouraged to continuously reinvent themselves and learn everything needed to stay in the game.

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