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Jun He

University of Michigan - Dearborn, junhe@umd.umich.edu

Yi Maggie Guo

University of Michigan at Dearborn, magyiguo@umd.umich.edu

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SHOULD I TAKE MISXXX? IMPLICATIONS FROM INTERVIEWS WITH BUSINESS RECRUITERS

Jun He

University of Michigan - Dearborn
junhe@umd.umich.edu

Yi Maggie Guo

University of Michigan - Dearborn
magyiguo@umd.umich.edu

ABSTRACT

It is important for MIS educators to have a good understanding of what IT knowledge and skill are required in business. In this study, a total of 103 semi-structured interviews were conducted with hiring companies in the Midwest region. The interviews with key business recruiters suggest that IT knowledge and skills are significantly considered during the recruiting process, even if the target position is not IT-related. The most sought-after skills are summarized. Implications for MIS education are discussed.

Keywords

IT knowledge and skills, IT education

INTRODUCTION

“Should I take MISXXX?” Non-MIS business majors often ask the question before deciding the curriculum. As information technology (IT) increasingly saturates our daily life, few people doubt the importance of IT knowledge and skills to one’s future career success. However, many students are daunted from taking MIS courses by the misperception that IT could be hard and boring (Beyer, 2008; Karsten and Schmidt, 2008; He and Freeman, 2010); others puzzle over the proper IT coverage in the curriculum.

IT knowledge and skills set the cognitive foundation upon which one can employ IT tools to solve business problems (Compeau and Higgins, 1995). Empirical studies provide strong evidence that IT-related abilities largely shape one’s job performance. The make-up of IT knowledge and skills, however, remains unclear in the literature (Gregor, 2006). The vague understanding of IT knowledge and skills leads to the symbolic use of computers or computing applications as a proxy for assessing one’s ability of utilizing IT in the broad way. This will inevitably restrict our research of IT influence in workplace from further advance.

This study attempts to advance our understanding of what IT knowledge and skill are required in business. Unlike previous research that focuses on the special knowledge requirements of IT workforce, the current study pays much attention to other business professions. Such an investigation will enrich our understanding of IT knowledge and skills beyond the boundary of IT profession, provide important guidance to the development of IT curriculum for all business majors, and alleviate the often “significant disconnect between the realms of business and education” (LaFrance 2010; p. 25).

The paper proceeds as follows. First, previous efforts of studying IT knowledge and skills are reviewed, and a gap in our understanding of IT knowledge and skills required by other business professions is highlighted. Then, a research strategy is developed by using case research with semi-structured interviews. Results of the interviews are summarized. The paper ends with a discussion of the implications from the results.

LITERATURE REVIEW

One objective of MIS education is to provide students, both MIS majors and non-MIS majors, with IT knowledge and skills that will be needed for the success in their future careers (He and Freeman, 2010). Recently, understanding the makeup of IT knowledge and skills has received increasing attention among IS researchers. Research in the area provides important guidance to education, training, and career development.

There are two lines of research on IT knowledge and skills. One line of the research studies the effects of IT-related abilities on job/task performance. Exemplary measures include perceived ease of use (Davis et al., 1989; Venkatesh, 2000; Venkatesh et al., 2003), computer self-efficacy (Compeau and Higgins, 1995), general and specific computer self-efficacy (Marakus et al., 1998, 2007), computer anxiety (Harrison and Rainer, 1992; Compeau et al., 1999), and personal innovativeness in IT

(Thatcher and Perrewe, 2002). Through the development of IT behavioral theories and models, research in this line has established a strong linkage between one's IT-related abilities and his/her performance on job or on particular tasks.

Another line of the research studies the makeup of IT knowledge and skills that are required in the business world. The research can find its trace back to the seminal work of Ashenhurst (1972), in which important recommendations were given to IT curriculum development. Since then, numerous attempts have been conducted to depict an overall pattern of IT knowledge and skills. Table 1 summarizes the recent works in this area.

Paper	Research Subject	Key Dimensions or Categories
Nelson 1991	IS and business professionals	<ul style="list-style-type: none"> Organizational knowledge (knowledge of the organizational goals and objectives, key functions, and environmental factors) Organizational skills (interpersonal, group, and project skills) Organizational unit (knowledge of work unit objectives, problems, and links to others) General IS knowledge (IS policies, main IS applications, privacy policies etc) Technical skills (programming, database, etc) IS product knowledge (specific applications being used)
Leitheiser 1992	IS managers	<ul style="list-style-type: none"> Developer (interpersonal, analysis and design, programming, business, environment, programming language, specific application) Specialist (database and data communication, software, hardware, advanced applications)
Lee et al 1995	IS managers, business managers, and IS consultants	<ul style="list-style-type: none"> Technical specialties knowledge Knowledge of technology management Business functional knowledge Interpersonal and management skills
Todd et al., 1995	Content of advertisements for IS professionals	<ul style="list-style-type: none"> Technical skills (relating to hardware and software competence) Business skills (industry and organizational knowledge, interpersonal, and communication skills) System skills (analytical, modeling, and problem-solving skills).
Lee et al., 2002	IS professionals	<ul style="list-style-type: none"> IS core knowledge Organizational and society knowledge (specific functional areas, specific organizations, specific industries, and general environment) Interpersonal (interpersonal behavior, interpersonal communication, international communication ability, teaching and training skills) Personal traits (Personal motivation and ability to work independently, creative thinking, critical thinking)
Bassellier et al., 2001 and 2003	Business managers	<p>IT competence components:</p> <ul style="list-style-type: none"> Explicit knowledge: technology, applications, system development, management of IT, access to IT knowledge

		<ul style="list-style-type: none"> • Tacit knowledge: experience and cognition
Bassellier and Benbasat, 2004	IT professionals	Business competence <ul style="list-style-type: none"> • Organization-specific (organizational overview, organizational units, organizational responsibility, IT-business integration) • Interpersonal and management (interpersonal communication, leadership, knowledge networking).
Cash et al., 2004	IS professionals	<ul style="list-style-type: none"> • Technical (hardware, system, application, and software knowledge) • Business (Organizational, business, and management-related competencies) • Relationship (interpersonal skills) • Conceptual (the ability of taking unrelated information and organize it in an ordered manner)
Gallivan et al., 2004	Classified job advertising for IT professionals	<ul style="list-style-type: none"> • Operating system skills • Programming language skills • Networks/communications skills • Software development tools • Non-technical skills (communication, interpersonal, leadership, organization, self-motivation, and creativity)
Litechy et al., 2004	IS hiring	<ul style="list-style-type: none"> • Technical skills (skills acquired through training and education or learned on the job and are specific to each work setting) • Soft skills (the cluster of personality traits, social graces, language skills, friendliness, and optimism that mark each one of us to varying degrees)
Simon et al., 2007	IT executives	<ul style="list-style-type: none"> • Technical • Project management • Business domain • Source • IT administration
Smith, 2008	Chief audit executives	Three categories of IT knowledge that are relevant for internal auditors <ul style="list-style-type: none"> • Basic IT knowledge needed by all professional auditors, focusing on computing concepts • Special knowledge needed by auditor supervisors for managing auditing process • Technical knowledge for IT audit specialists.
Lee and Mirchandani, 2010	IT managers	Dynamics of the importance of 17 sets of IT skills

Table 1. Literature Review of Key Dimensions of IT Knowledge and Skills

As demonstrated in Table 1, researchers have developed various IT-skill taxonomies, and there is no commonly-agreed IT theory to explain the makeup of IT knowledge and skills (Lee et al., 2002; Gregor, 2006). Two reasons may explain the phenomenon. First, the frequent changes in the technological environment require a constant adjustment for the relevance of key dimensions of IT knowledge and skills (Lee et al., 1995; Todd et al., 1995), making it “an impossible task” to produce a valid list of concrete computing skills (He and Freeman, 2010). Taking the recent ascension of E-Commerce as an example, “the implementation of e-commerce in an organisation has introduced three main business changes: changes in business

expectations, in business perceptions, and in business compliance. These three changes ... have driven changes in the competency requirements of IS professionals (Cash et al., 2004; p. 62).” Secondly, IT is a diverse field of a variety of domains, each of which has its own set of core knowledge. Coupled with the fast pace of technology development, it is hard to have a taxonomy that is both general enough to cover all the advancements and parsimonious reasonably for a meaningful interpretation.

In addition, prior research on IT knowledge and skills has emphasized much on the special knowledge requirements of IT workforce. Little attention has been paid to the basic IT skills that are essential for other business professions (the work of Smith (2008) is a rare exception). Given the fast pace of IT proliferation in today’s organizations, we need to develop a better understanding of IT-related knowledge and skills that are required in the broad business world beyond the boundary of IT profession. For this purpose, we conduct the current research.

RESEARCH METHODS

The research intends to identify a general pattern of expected IT knowledge and skills in the job market under the assumption that business recruiters require certain IT qualifications for successful job candidates. To serve the end, we employed a qualitative research strategy with semi-structured interviews. Business recruiters that were able to make hiring decisions were sampled, semi-structured interviews were conducted with questions designed to explore the implicit IT requirements while allowing the emergence of new questions in order to fully understand a phenomenon that is complex, dynamic, and practical in nature.

Research Participants

Many private and public organizations located in the Midwest region with potential hiring in near future were contacted for participating in the study. These organizations all had internship or other collaboration programs with the researchers’ university so that the chance of participation in the study was very high. Each opening position was treated as one case for the study of required IT knowledge of skills in business. Background information of the sampled organizations was collected during interviews with key recruiters. In total, eighty-six organizations participated in the study. Profiles of the participated organizations are reported in Table 2 for company size and Table 3 for industry distribution.

Company Size	Counts	Total
Small	8	86
Medium	14	
Large	58	
Not Reported	6	

Table 2. Company Sizes

Our sample is dominated with large companies (about 67%), followed by medium-sized companies (about 16%) and small companies (9%). Six organizations did not release the information of their business scale. Thus, results from the interviews should be read with caution that the investigated positions are skewed toward the hiring of large organizations.

Industry	Counts	Total
Auto Industry	25	86
Manufacturing other than Auto	16	
Finance and Banking	5	
Marketing and Business Consulting	3	
Retailing and Distribution	7	
Telecommunication and IT	7	
Healthcare	6	
Energy and Environment	6	
Education and Publication	3	
Non-Profit Organizations	4	
Military	2	

Government	2	
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Table 3. Industry Distributions

As demonstrated in Table 3, 41 out of 86 (or 47%) participated organizations were in auto and other manufacturing areas; the rest evenly distributed over 10 other industries. Such a pattern is consistent with the manufacturing-oriented economy of the “rust belt”. Thus, job openings from these organizations, if not representing a national pattern, provide important insights of the Midwest job market.

Data Collection and Analysis

Interview teams composed with MBA students (with an average work experience of six years) conducted interviews with key recruiters of the participated organizations. All interviewers had been trained on how to conduct semi-structured interviews before leaving for the assignment. Following questions had been prepared for the interviews:

1. Please describe the position that you are planning to recruit, including the job description, the management level, and some primary tasks.
2. Please describe the qualifications (education background and professional experiences) that you expect for a successful job candidate.
3. Please describe the IT knowledge and skills that are expected for the position, and rank them in terms of importance.

Based on the progress of an interview, additional questions were raised. They might include the influence of the current economic crisis on the hiring, the demand and the supply of qualified candidates, and the expectations for business education. Each interview lasted about twenty to thirty minutes. All interviews were noted and the transcripts were returned to interviewees for checking before analysis. Researchers jointly coded the interview transcripts for IT knowledge and Skills that were required or expected by these business recruiters.

Findings

103 cases of position opening were collected via interviews with recruiters. The interviews have generated rich data about IT knowledge and skills required by different business professions. The breakdown of job categories is reported in Table 4. As the data shows, our sample covers a broad range of business professions. The comparatively high numbers of job openings in manufacturing, operation, and supply chain management reflect the regional economic structure of Midwest.

Job Category	Counts	Total
Accounting	6	103
Finance	7	
Marketing	17	
Human Resources	5	
Operation and Supply Chain Management	19	
Manufacturing	27	
IT	15	
Office Administration	7	

Table 4. Job Categories

Table 5 reports the management levels of these positions. About 60% of the investigated positions were at entry level, the rest were at the middle management level. Our sample does not include any senior level positions. Probably due to the sensitivity of senior-level positions to an organization’s operation status and business strategy, the participated organizations were reluctant to release information about any senior-level position opening.

Position Levels	Counts	Total
Entry Level	62	103
Middle Management Level	41	

Table 5. Position Levels

We coded IT knowledge and skills into ten categories. *General Computing* includes basic knowledge of computers, basic knowledge of Microsoft Office Suite, and using operating systems, such as Windows. *Database* covers all database-related issues, including database development and management. It also includes using particular database software other than ERP and SAP. *Project Management* covers the skills of project management, time management, and multi-task management. *Communication via IT* includes the use of emails, PowerPoints, and electronic devices (e.g., mobile devices and teleconferencing) for oral and written communications. *Internet Knowledge* covers the knowledge of web surfing and search, website development and maintenance, and social media. *Networking* involves the use of network devices and software, such as FTP. Excel and Word were singled out because most recruiters viewed them as stand-alone skills. Other categories are self explanatory.

Table 6 reports the frequency of each IT skill being mentioned by the sampled business recruiters. Of the ten IT-skill categories, more than half of the recruiters had expressed expectations for database, general computing, Excel, and communication via IT, suggesting that questions of the four IT skills would very likely be asked in a job interview. In contrast, 15% and 13% of the sampled recruiters had mentioned programming and networking skills respectively; the chance of having questions of the two IT skills would be low in a general job interview.

Skills	Frequencies	Possibility of Being Asked	Rank
Database	71	69%	1
General Computing	69	67%	2
Excel	57	55%	3
Communication via IT	57	55%	4
Project Management	43	42%	5
Word	36	35%	6
ERP/SAP	25	24%	7
Internet	23	22%	8
Programming	15	15%	9
Networking	13	13%	10

Table 6. Frequency Ranking of IT Skills

It may not be enough to know the possibility of an IT skill being asked in job interviews; candidates will be eager to learn the extent to which recruiters count the IT skill for judging one’s job qualification. A balanced analysis of the relevance of an IT skill should take into account both the possibility of being asked and the perceived importance from recruiters. Such analysis is presented in Table 7, in which we calculate the product of frequency and perceived importance as the weighted relevance for each IT skill. For an easy interpretation, the results are standardized by assigning the level of 100 to the most heavily weighted IT skill.

Skills	Weights	Rank
General Computing	100	1
Excel	89	2
Database	85	3
Communication via IT	84	4
Project Management	57	5
Word	54	6
ERP/SAP	34	7
Internet	25	8
Networking	18	9
Programming	18	10

Table 7. Weighted Ranking of IT Skills

The pattern of Table 7 is similar to that of Table 6, with an exception that the rank of database skill drops from the first in frequency counts to the third in weights. This change suggests that the sampled recruiters were looking for working knowledge rather than mastery of database from job candidates.

DISCUSSION

The importance of IT knowledge and skills to one's career success is widely accepted (He and Freeman, 2010). The study provides further evidence that one may not be able to start a career without knowing IT. For the 103 opening positions investigated in the study, all recruiters agreed that IT knowledge and skills should be significantly considered during the hiring process. One recruiter observed that "90% of what our engineers do is on computer." Another recruiter pointed out that "people with advanced technical skills seem to excel at the job." In a rare case, one recruiter admitted ignorance on the issue: "It's interesting how important these skills are to our work but honestly I've never thought about it before ... I just assume that most people have IT skills and if they don't I assume they can be taught pretty easily."

Findings of the study suggest that questions of database, general computing, Excel, and communication via IT are likely to be asked in job interviews. Often it is the answer of an IT-skill question that sets a job candidate apart from the large pool of applicants. One recruiter noted that most applicants had prepared well for common questions such as personal weakness and strength, but failed on Excel questions. She further commented that "a person who really knows Excel stands out of the crowd." Further data analysis is planned to investigate about the depth of knowledge in these skills sought by businesses. We believe this insight will prove to be very helpful.

The importance of having database skills and project management skills needs further attention. The requirement of database skills reflects a reality in which business operations have been largely digitalized. For example, for a marketing position, a recruiter described the primary tasks as dealing with "the input of customer orders, distribution of supplies, payment and collection dates, and databases housing their ... data sheets." It is common in the workplace, remarked by another recruiter, that "managers are constantly training themselves on ... the company's proprietary applications and databases." In many cases, familiarity with Microsoft Access had been mentioned as a proxy for one's knowledge of database. In a small company, the recruiter admitted that "knowledge in Access is crucial because this is the main database for established customer information here."

Having project management skills was required by 42% of the sampled recruiters for successful job candidates. Unlike the way we define project management in academic research, business recruiters interpret the term with broad meaning that covers the ability to schedule product deliveries, manage business processes, work under pressure, cope with multiple tasks, facilitate teamwork, motivate colleagues and keep good relationship with different management levels. This reflects that many companies have adopted project-based team structures in workplace. Such a broad and practical set of skills can hardly be assessed during a brief interview. However, most recruiters mentioned that experience with MS Project or similar project management software could be used as the indicator.

Less than 30% of the sampled recruiters had mentioned ERP/SAP, Internet, programming, and networking skills in their expectation for successful candidates. This finding is contradictory to our original expectations. With many of the sampled companies being in the manufacturing sector, we predicted that specialist technical skills (Leitheiser 1992) such as ERP and networking would be required especially for operation-related positions. An in-depth analysis of the interview transcripts suggests that the result should be taken with caution. We found that most recruiters would not ask questions of ERP/SAP when interviewing job candidates unless some integrated enterprise systems had been implemented in their organizations. For organizations where ERP/SAP had been in workplace, recruiters admitted that showing adequate knowledge of ERP/SAP would no doubt give a job candidate the edge; however, many of the recruiters also stated that training for the special integrated enterprise systems would be provided in work, therefore the knowledge of ERP/SAP would not be a determining factor for them to make hiring decisions. Similar phenomena exist for the programming and networking knowledge. As for Internet skills, we found that the special set of IT skills was almost exclusively asked for marketing positions. One recruiter remarked that "beyond that (of classical marketing knowledge) we need someone who understands websites, social networking sites, online marketing, etc." Thus, we conclude that in general the technical knowledge and skills of ERP/SAP, Internet, programming, and networking are more of a differentiator rather than a requirement in a recruiting process.

This study attempts to depict the overall IT requirements raised from the business world. The findings provide strong implications for MIS education. First, we should assure that our curriculum has a broad coverage of IT knowledge and skills that are highly expected by companies. Secondly, we need to understand the different requirements on IT skills from business. Broad knowledge of IT including general computing and communication via IT will help a student enter the competitive job market; mastery of particular applications such as Excel, MS project, ERP/SAP may help the student stand

out from the crowd. The two aspects should be treated with elegant balance in our curriculum. Without a good understanding of the basic IT, students will not be able to pass the bar to get into the ring at all.

Findings of the study will help MIS authors develop textbooks that meet with industry requirements. The introduction and exercise of certain applications, such as MS Access and MS Project, should be incorporated in the book. The mastery of these particular applications will be recognized by business recruiters as valid indicators for meeting certain requirements of qualification.

Although it is not our focus, the study provides implications for the research of IT influence in workplace. Current measures for one's IT-related abilities have focused largely on the use of computers and computing applications. Taking computer self-efficacy as an example, the concept is deemed an appropriate construct for understanding people's reactions to IT or IT-based applications (Marakas et al., 2007). Findings of the study suggest that a broader range of IT knowledge and skills are required in real business. Narrowing our attention on the use of computers may limit the research from further advance. This study provides guidelines for designing new measures of IT ability with dimensions that are relevant to current business reality.

CONCLUSION

Understanding IT-related knowledge and skill needs in different business occupations "is especially important for IS academics since it directly influences what we teach our students" (Cash et al 2004, p. 60). This study is another endeavor to enrich our understanding of IT knowledge and skills with special interests in the requirements of non-IT business professions.

Semi-structured interviews were conducted with 86 hiring companies in the Midwest United States. Questions were centered on the required or preferred IT knowledge and skills for a target position. Data from a total of 103 position openings were collected. Recruiters widely agreed that IT knowledge and skills should be significantly considered during the hiring process. 10 categories of IT skills were identified from the interviews. These IT skills are ranked in terms of frequency and perceived importance; their relevance to the current business reality is discussed.

Today, the proliferation of IT imposes strong requirements of IT knowledge and skills on business professionals across all occupations. Thus, we need to deliver IT knowledge and skills in an efficient and effective way to help our students gain an edge in the competitive job market, and eventually achieve success in their future career. However, our curriculum is typically designed for students majored in MIS; the special needs of non-MIS majors are not well addressed. As MIS educators, it is a challenge as well as our reasonability to make appropriate adjustments in the MIS curriculum. We should encourage our students to take MIS courses, deliver IT knowledge and skills that are relevant to real business, and prepare our students for the challenge of IT-enabled global economy.

We hope the study will help MIS educators to convince students of the importance of learning IT, and guide the selection of MIS courses regardless of their majors. Indeed, the necessity of increasing MIS education does not come from IS educators; rather, business recruiters are speaking out with their raised expectations of advanced IT skills for job candidates.

REFERENCE

1. Ashenhurst, R.R. (1972) Curriculum recommendations for graduate professional programs in information systems, *Communications of the ACM*, 15, 5, 363-398.
2. Bandura, A. (1977) Self-efficacy: Toward a unifying theory of behavioral change, *Psychological Review*, 84, 2, 191-215.
3. Bassellier, G. and Benbasat, I. (2004) Business competence of information technology professionals: Conceptual development and influence on IT-business partnerships, *MIS Quarterly*, 28, 4, 673-694.
4. Bassellier, G., Benbasat, I., and Reich, B. "The Influence of Business Managers' IT Competence on Championing IT", *Information Systems Research*, 14 (4), December 2003, pp. 317-336.
5. Bassellier, G., Reich, B., and Benbasat, I., "Information Technology Competence of Business Managers: A Definition and Research Model", *Journal of Management Information Systems*, 17 (4), Spring 2001, pp. 159-182.
6. Cash, E., Yoong, P., and Huff, S. (2004) The impact of e-commerce on the role of IS professionals, *The DATA BASE for Advances in Information Systems*, 35, 3, 50-63.
7. Compeau, D. R. and Higgins, C.A. (1995) Computer self-efficacy: Development of a measure and initial test, *MIS Quarterly*, 19, 2, 189-211.
8. Compeau, D.R., Higgins, C.A., and Huff, S. (1999) Social cognitive theory and individual reactions to computing technology: A longitudinal study, *MIS Quarterly*, 23, 2, 145-158.
9. Davis, F.D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13, 3, 318-340.
10. Davis, F.D., Bagozzi, R.P., and Warshwa, P.R. (1989) User acceptance of computer technology: A comparison of two theoretical models, *Management Science*, 35, 8, 982-1003.

11. Gallivan, M. J., Truex III, D. P., and Kvasny, L. (2004) Changing patterns in IT skill sets 1988–2003: A content analysis of classified advertising, *The DATA BASE for Advances in Information Systems*, 35, 3, 64–87.
12. Gregor, S. (2006) The nature of theory in information systems, *MIS Quarterly*, 30, 3, 611-642.
13. Harrison, A.W., and Rainer Jr., R.K. (1992) The influence of individual differences on skill in end-user computing, *Journal of Management Information Systems*, 9, 1, 93-111.
14. He, J., and Freeman, L. (2010) Understanding the formation of general computer self-efficacy, *Communications of the Association for Information Systems*, 26, 12, 225-244.
15. LaFrance, G. (2010) Bridging the IT skills gap through industry and academic collaboration, *Employment Relations Today*, 36, 25-30.
16. Lee, D.M.S., Trauth, E.M., and Farwell, D. (1995) Critical skills and knowledge requirements of IS professionals: A joint academic/industry investigation, *MIS Quarterly*, 19, 3, 313–340.
17. Lee, K., and Mirchandani, M. (2010) Dynamics of the importance of IS/IT skills, *The Journal of Computer Information Systems*, 50, 4, 67-78.
18. Lee, S., Koh, S., Yen, D., and Tang, H.-L. (2002) Perception gaps between IS academics and IS practitioners: An exploratory study, *Information & Management*, 40, 1, 51-61.
19. Leitheiser, R.L. (1992) MIS skills for the 1990s: A survey of MIS managers' perceptions, *Journal of Management Information Systems*, 9, 1, 69-91.
20. Litecky, C.R., Arnett, K.P., and Prabhakar, B. (2004) The paradox of soft skills versus technical skills in IS hiring, *Journal of Computer Information Systems*, 45, 1, 69-76.
21. Marakas, G.M., Johnson, R.D. and Clay, P.F. (2007) The evolving nature of the computer self-efficacy construct: An empirical investigation of measurement construction, validity, reliability and stability over time, *Journal of the Association for Information Systems*, 8, 1, 15-46.
22. Marakas, G.M., Yi, M.Y., and Johnson, R.D. (1998) The multilevel and multifaceted character of computer self-efficacy: Toward clarification of the construct and an integrative framework for research, *Information Systems Research*, 9, 2, 126-163.
23. Nelson, R.R. (1991) Educational needs as perceived by IS and end-user personnel: A survey of knowledge and skill requirements, *MIS Quarterly*, 15, 4, 502–525.
24. Simon, J.C., and Kaiser, K.M., Beath, C., Goles, T., and dGallagher, K. (2007) Information technology workforce skills: Does size matter? *Information Systems Management*, 24, 4, 345-359.
25. Thatcher, J.B., and Perrese, P.L. (2002) An Empirical Examination of Individual Traits as Antecedents to Computer Anxiety and Computer Self-Efficacy, *MIS Quarterly*, 26, 4, 381-396.
26. Todd, P.A., McKeen, J.D., and Gallupe, R.B. (1995) The Evolution of IS Job Skills: A Content Analysis of IS Job Advertisements from 1970 to 1990, *MIS Quarterly*, 19, 1, 1-27.
27. Venkatesh, V. (2000) Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model, *Information Systems Research*, 11, 4, 342-365.
28. Venkatesh, V., Morris, M.G., Davis, G.B., and Davis, F.D. (2003) User acceptance of information technology: Toward a unified view, *MIS Quarterly*, 27, 3, 425-478.