

5-2010

# IT Knowledge and Skills Required in Business – An Investigation of Different Business Professions

Jun He

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

Follow this and additional works at: <http://aisel.aisnet.org/mwais2010>

---

## Recommended Citation

He, Jun, "IT Knowledge and Skills Required in Business – An Investigation of Different Business Professions" (2010). *MWAIS 2010 Proceedings*. 6.

<http://aisel.aisnet.org/mwais2010/6>

This material is brought to you by the Midwest (MWAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in MWAIS 2010 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# IT Knowledge and Skills Required in Business – An Investigation of Different Business Professions

**Jun He**

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

## **ABSTRACT**

Developing a comprehensive understanding of IT-related knowledge and skill has great importance to the IS education and research community. This study attempts to enrich our understanding of the needed IT knowledge and skills with special interests in business professions other than IT. Semi-structured interviews were conducted with thirty-two recruiters from companies in the Midwest region. The findings indicate that IT knowledge and skills have been significantly considered during the recruiting process, even if the target position has no direct IT requirements. The implications of these findings for business education and career development are discussed.

## **Keywords**

IT knowledge and skills, IT education.

## **INTRODUCTION**

One objective of MIS education is to provide students with information technology (IT) knowledge and skills that will be needed for the success in their future careers. As IT increasingly saturates our daily life, understanding IT knowledge and skills has received increasing attention among IS researchers. Research in the domain 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 relevance of having IT knowledge and skills to cope with different business tasks. Through the development of IT behavioral theories and models, research in this line has established a strong linkage between one's IT-related knowledge and skills and the person's performance on certain tasks or in certain business environment. Another line of the research selects to study the makeup of IT knowledge and skills that are required in the business world. Comparatively, the second line of research lags behind the first line of research in developing a widely-accepted and empirically-validated theory for the makeup of IT knowledge and skills (Gregor 2006). The lack of comprehensive understanding of IT knowledge and skills, in turn, limit the first line of research from further advance beyond the area of using computers or computing applications.

This study attempts to advance our understanding of IT knowledge and skills. Unlike previous research that focuses on the knowledge requirements within IT workforce, the current study investigates IT knowledge and skills required by other business professions. Such an investigation will enrich our understanding of IT knowledge and skills beyond the boundaries of IT, and will provide important guidance to the development of IT curriculum especially for non-IT-major students.

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 structured interview as the main research strategy is developed. The results of the interview are summarized. The paper ends with a discussion of the implications from the results.

## **LITERATURE REVIEW**

There are two lines of research in the study of IT knowledge and skills. One line of the research attempts to assess one's ability of using information technologies to cope with certain tasks, the other line of research tries to portray the overall pattern of IT knowledge and skills being employed in business workforce. Both lines of research enhance our understanding of the relevance and the makeup of IT knowledge and skills, and provide important guidance to business education, training, and career development.

For assessing IT-related abilities, several measures have been proposed in the IS literature with much emphasis on the use of computers and/or computing applications. These measures include perceived ease of use of certain computing applications (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). The ability of using computers or computing applications is widely perceived as an important proxy of, if not equivalent to, the ability of utilizing IT to cope with business problems.

The concept of computer self-efficacy (CSE) may serve as an example to illustrate the extent to which the research of IT-related abilities has been narrowed to the use of computers or computing applications. CSE is a special application of the more general construct of self-efficacy, which is a key element of social cognitive theory developed in the field of learning and individual behavior (Bandura, 1977). CSE is commonly defined as one's judgment of his/her capability to use a computer (Compeau and Higgins, 1995). CSE exists at both the general computing behavior level and the specific computer task or application level (Marakas et al., 1998). General CSE refers to an individual's judgment of his or her ability to perform across multiple computer application domains; specific CSEs refer to an individual's perception of efficacy in performing specific computer-related tasks within the domain of general computing. CSE at the general computing level is deemed an appropriate construct for understanding people's reactions to IT or IT-based applications (Marakas et al., 2007). Indeed, a key factor in the influential technology acceptance model, perceived ease of use, has its theoretical roots in the concept of CSE (Davis et al., 1989; Venkatesh and Davis, 1996). Potential users may be reluctant to use a computing application if they believe the technology "is too hard to use and that the performance benefits of usage are outweighed by the effort of using the application" (Davis et al. 1989, p. 320).

On another research line, researchers try to depict the overall pattern of IT knowledge and skills that are needed in the business world. The research tradition may trace back to 1972 when Ashenhurst (1972) gave important recommendations to the development of IT curriculum. The increasing proliferation of IT in workforce has generated great interests in studying the pattern of IT knowledge and skills especially in recent years. For example, Bassellier and Benbasat (2004) investigated the competence of IT professionals regarding their interactions with other business areas; Cash et al. (2004) assessed the role of IT professionals in the advance of E-Commerce; Gallivan et al. (2004) studied key skills employed in IT workforce; and Litecky et al. (2004) examined the most needed skills in IT recruiting. These studies are summarized in Table 1.

Paper	Research Subject	Key Dimensions or Categories
Nelson 1991	IS and business professionals	<ul style="list-style-type: none"> <li>• Organizational knowledge (knowledge of the organizational goals and objectives, key functions, and environmental factors)</li> <li>• Organizational skills (interpersonal, group, and project skills)</li> <li>• Organizational unit (knowledge of work unit objectives, problems, and links to others)</li> <li>• General IS knowledge (IS policies, main IS applications, privacy policies etc)</li> <li>• Technical skills (programming, database, etc)</li> <li>• IS product knowledge (specific applications being used)</li> </ul>
Leitheiser 1992	IS managers	<ul style="list-style-type: none"> <li>• Developer (interpersonal, analysis and design, programming, business, environment, programming language, specific application)</li> <li>• Specialist (database and data communication, software, hardware, advanced applications)</li> </ul>
Lee et al 1995	IS managers, business managers, and IS consultants	<ul style="list-style-type: none"> <li>• Technical specialties knowledge</li> <li>• Knowledge of technology management</li> <li>• Business functional knowledge</li> <li>• Interpersonal and management skills</li> </ul>
Todd et al 1995	Content of advertisements for IS professionals	<ul style="list-style-type: none"> <li>• Technical skills (relating to hardware and software competence)</li> <li>• Business skills (industry and organizational knowledge, interpersonal, and communication skills)</li> <li>• System skills (analytical, modeling, and problem-solving skills).</li> </ul>
Lee et al 2002	IS professionals	<ul style="list-style-type: none"> <li>• IS core knowledge</li> <li>• Organizational and society knowledge (specific functional areas, specific organizations, specific industries, and general environment)</li> <li>• Interpersonal (interpersonal behavior, interpersonal communication, international communication ability, teaching and training skills)</li> <li>• Personal traits (Personal motivation and ability to work independently, creative thinking, critical thinking)</li> </ul>
Bassellier and Benbasat 2004	IT professionals	<ul style="list-style-type: none"> <li>• Business competence <ul style="list-style-type: none"> <li>○ Organization-specific (organizational overview, organizational units, organizational responsibility, IT-business integration)</li> <li>○ Interpersonal and management (interpersonal communication, leadership, knowledge networking).</li> </ul> </li> </ul>
Cash et al 2004	IS professionals	<ul style="list-style-type: none"> <li>• Technical (hardware, system, application, and software knowledge)</li> <li>• Business (Organizational, business, and management-related competencies)</li> <li>• Relationship (interpersonal skills)</li> <li>• Conceptual (the ability of taking unrelated information and organize it in an ordered manner)</li> </ul>
Gallivan et al 2004	Classified job advertising for IT	<ul style="list-style-type: none"> <li>• Operating system skills</li> </ul>

	professionals	<ul style="list-style-type: none"> <li>• Programming language skills</li> <li>• Networks/communications skills</li> <li>• Software development tools</li> <li>• Non-technical skills (communication, interpersonal, leadership, organization, self-motivation, and creativity)</li> </ul>
Litechy et al 2004	IS hiring	<ul style="list-style-type: none"> <li>• Technical skills (skills acquired through training and education or learned on the job and are specific to each work setting)</li> <li>• Soft skills (the cluster of personality traits, social graces, language skills, friendliness, and optimism that mark each one of us to varying degrees)</li> </ul>

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

As demonstrated in Table 1, one distinct implication from the previous research is that hand-on technical skills (e.g., skills of using hardware, software, programming, and operating systems) are only a subset of the overall IT knowledge and skills. The ability of using computers to deal with other business activities (e.g., communication, interpersonal relationship, management, and leadership) has been viewed as an important dimension.

Another implication is that there is no commonly-agreed theory and taxonomy for the makeup of IT knowledge and skills (Lee et al., 2002), partially because the frequent changes in the technological environment that requires a constant adjustment for the relevance of key dimensions of IT knowledge and skills (Lee et al., 1995; Todd et al., 1995). 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).”

In addition, the study of the makeup of IT knowledge and skills has been limited to the special workforce of IT. The investigation of IT knowledge requirements of other business professions is rare. Given the fast pace of IT proliferation, we need to develop a better understanding of IT-related knowledge and skills that are required in the broad business world beyond the boundaries of IT professions.

The current study attempts to enrich our understanding of IT knowledge and skills with special interest in the requirements of other business professions.

## RESEARCH METHODS

### Research Participants

This research employs semi-structured interviews to collect data from participant companies. Thirty-two HR recruiters participated in the study. They were selected from a variety of private and public companies in the Midwest United States. These companies have internship or other collaboration programs with the researcher’s university. Most participants hold leading positions (e.g., manager, director) in their human resources departments. They all plan to recruit for their organizations in the near future. Targeting positions are business professions at entry-level or middle-level in their organizations.

### Data Collection and Analysis

Semi-structured interviews were conducted with each participant. Questions prepared for each interview included, but were not limited to:

1. Please describe the position that you are planning to recruit, including the job description, the management level, and the primary task for the position.
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 required for the position, including both the technical skills (e.g., programming, database management skills) and non-technical skills (e.g., interpersonal skills, project management skills, and personalities).
4. Among the required IT knowledge and skills, what do you perceive as the most important for your organization? And what would set a candidate apart from the pool of applicants?

Based on the progress of an interview, additional questions were raised such as 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 thirty minutes. All the interviews were recorded, transcribed, returned to the participant for checking, and are now under examinations by the researcher.

### Findings

The interviews have generated rich data about IT knowledge and skills required by different business professions. The data are currently under careful examinations by the researcher. Initial scan of the data suggests that:

1. IT knowledge and skills are significantly considered during the hiring process, even if the target position is not IT-related.
2. Overall, recruiters have placed more emphasis on non-technical skills such as interpersonal skills and project management skills than that on concrete technical skills; however, proficiency of non-technical skills often require mastery of certain information technologies such as communication technologies and project management software.
3. The ability of working on a wide-range of jobs beyond the target position is highly appreciated by recruiters. Evidence of such ability is often demonstrated by working knowledge of related technologies or tools.

As for the detailed IT knowledge and skills that are required across different business professions, responses of the interviews suggested that:

- The required IT technical skills
  1. Proficiency with MS Office is the most frequently mentioned IT skills across different business professions. Advanced knowledge in Excel has been singled out as a key indicator of being able to perform data analysis in business. PowerPoint has also been mentioned as
  2. Database skills, including a basic understanding of database systems and the ability of data manipulation, are preferred for many positions such as business analysts, business assistants, and assistant project managers.
  3. Networking skills, especially website development skills, are preferred for some entry-level positions.
- The required non-technical skills
  1. Interpersonal skills, especially written and oral communication skills, are the most frequently mentioned skills for job candidates. Proficiency in these communication skills often requires the ability of using different communication technologies (e.g., teleconferencing).
  2. Project management skills are another frequently-mentioned set of skills during the interviews. Project management skills include the ability to cope with multiple tasks, work under pressure, and maintain good relationship with different management levels. For some middle-level positions, the recruiters have mentioned that knowing MS Project or similar project/timeline management software is required.
  3. Teamwork and collaboration skills are highly preferred in that project-based working environment has been adopted by many companies. Although it is difficult to demonstrate teamwork and collaboration skills during a job interview, being able to use networking technologies for group communication and task facilitation is considered a strong evidence for processing these abilities.

### CONCLUSION

Understanding the 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 business professions other than IT.

Semi-structured interviews were conducted with thirty-two recruiters from companies in the Midwest United States. Questions were centered on the required or preferred IT knowledge and skills for a target position. Responses indicate that IT knowledge and skills are significantly considered during the hiring process, even if the target position is not IT-related. Comparatively, recruiters are more interested in non-technical skills such as interpersonal skills and project management skills; however, proficiency in these skills often require mastery of certain information technologies such as communication technologies and project management software.

Today, proliferation of IT has imposed strong requirements of IT knowledge and skills across all business professions. Teaching non-IT majors to master IT knowledge and skills will help students gain edge in the competitive job market, and eventually achieve success in their future career. However, our IT curriculum is typically designed for IT-majored business students. As IS educators and researchers, it is our reasonability as well as our challenge to make adjustments in the IT curriculum to serve the career requirements of IT knowledge and skills from other business professions.

## REFERENCES

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. 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.
5. Compeau, D. R. and Higgins, C.A. (1995) Computer self-efficacy: Development of a measure and initial test, *MIS Quarterly*, 19, 2, 189-211.
6. 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.
7. Davis, F.D. (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology, *MIS Quarterly*, 13, 3, 318-340.
8. 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.
9. 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.
10. Gregor, S. (2006) The Nature of Theory in Information Systems, *MIS Quarterly*, 30, 3, 611-642.
11. 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.
12. 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.
13. 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.
14. Leitheiser, R.L. (1992) MIS skills for the 1990s: A survey of MIS managers' perceptions, *Journal of Management Information Systems*, 9, 1, 69-91.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. Todd, P.A., McKeen, J.D., and Galleupe, 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.

21. 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.
22. Venkatesh, V., and Davis, F.D. (1996) A model of the antecedents of perceived ease of use: Development and test, *Decision Sciences*, 27, 3, 451-481.
23. 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.