

Is the Korean IT Manager Different?[†]

- A Comparison of Skill Requirements for IT Managers in the US and South Korea -

Choong Kwon Lee*, Han Reichgelt**, Sangjin Yoo*

요약 정보기술관리자는 기술과 비즈니스를 연결하는 교량으로서 매우 중요한 역할을 수행하기 때문에, 이들의 직무에 있어서 어떤 스킬이 요구되는지를 이해하는 것은 매우 중요하다. 기존의 많은 연구들이 정보기술관리자에게 필요한 스킬에 관해서 조사했을 지라도, 대부분의 연구들은 미국 내의 기업들로부터 얻어진 데이터를 기반으로 결과가 도출되었다. 그러나, IT 산업의 인력이동이 심해짐에 따라 다른 나라에서도 미국에서와 같은 스킬들이 요구되는지를 알아보는 것은 중요한 연구과제이다. 이에 본 연구는 IT관리자들의 직무수행에 요구되는 스킬에 있어서 한국과 미국 사이에 어떤 차이가 있는지를 알아보려고 한다.

핵심주제어 : 스킬, 정보기술관리자, 구인광고, 내용분석

Abstract Information Technology (IT) managers play an important role as a bridge between technology and business, and it is therefore important to determine what skills are required for this position. Although many previous studies have investigated the skills necessary for IT managers to perform their roles, most of these studies are based on the data collected from companies in the US. However, given the increased labor mobility in the IT industry, it is important to determine whether IT manager positions elsewhere require the same skills as the positions in the US. This study is a first step in this direction and attempts to determine whether there are any differences in skill requirements between Korean IT managers and American IT managers, and, if so, what they are.

Key Words : Skill, IT Manager, Job Ad, Content Analysis

1. Introduction

Organizations continue to rely heavily on IT as a tool for achieving their corporate objectives, and often rely on IT to give them a competitive advantage. In order to achieve this, it is crucial that the IT function is aligned with the other business functions in an organization, and the task of ensuring the alignment of IT resources and other business processes often

falls on the shoulders of the IT manager. Given the importance of the IT manager for the success of an organization, it becomes essential that the skills necessary for successful IT support are identified. This knowledge is potentially relevant not only to lower level IT professionals who are interested in moving to the upper level managerial positions, but also for educational institutions that want to design programs to prepare individuals for such positions.

Many previous studies have investigated the skills necessary for IT managers to perform their roles, and they have studied the IT manager from different angles, including functional responsibilities [1973], motivation [3],

[†] The present research has been conducted by the Bisa Research Grant of Keimyung University in 2007

* Department of Management Information Systems Keimyung University

** School of Computer & Software Engineering Southern Polytechnic State University

and training and development [1985]. Ives and Olson [7] examined the nature of the IT manager's job through the observation of six IT managers, and concluded that the IT manager was more of a manager than a technician and spends most of his/her time in contact with technical specialists rather than IT users. Stokes [13] reported that IT managers considered managerial skills critical to career success. A survey administered to over 200 large organizations in Australia and New Zealand also reported that IT managers were short of business and management skills [1]. Many other studies have revealed that behavioral skills such as leadership and communication [2, 8, 11] were more critical than technical ones for IT managers.

An alternative method that has been employed widely to investigate the skills necessary for a variety of IT positions has been the inspection of job advertisements. A number of researchers (e. g., [5, 9, 15]) have used job ads to identify the skill requirements and trends of IT professionals. For example, Todd and his colleagues [14] reported that the average number of skills mentioned in a newspaper job ad for an IT manager's position had increased from five in 1970 to seven in 1990. As the Internet job boards have emerged as the main medium for job applicants to find new employers, researchers (e. g., [5, 9]) have turned to online job ads to determine the skills requirement for IT professionals.

One of the limitations of the previous work is that it has, by and large, been limited to the organizations in the U.S with an exception of the study that collected and analyzed job ads looking for Korean IT managers [10]. Apart from an inherent interest in determining to what extent US organizational practices are followed in other countries, the increasing globalization of the market for IT employers also makes it

important to look at practices in other countries. US firms are increasingly forced to look abroad for IT employers. Moreover, it is not unlikely that at least some of the students currently enrolled in US universities, or IT professionals currently employed by US firms, may, at some stage, find employment with firms abroad. This paper as an extensive study using job ad data from a previous research [10] is a step towards answering the question whether there are noticeable differences in job requirements for IT managers in South Korea and the US, and, if so, what these differences are.

2. Data and Analysis

In order to answer the question about what differences, if any, there were in the skill requirements for IT managers in Korea and the U.S., we collected a total of 1163 relevant online job advertisements. We included job ads that contained the title "IT manager," "IT director," or "IT supervisor", but we excluded job ads with job titles such as "IT project manager" and "IT development manager". The primary reason is that jobs with the first set of titles are more likely to be permanent and not contract based, than those in the second group. As Table 1 shows, four commercial job websites in South Korea were visited to collect job ads for IT managers. The same data set of 421 ads [10] were also used for this study. More than 85 percent of the ads collected were for jobs from the capital city, Seoul. We collected US job ads from Fortune 500 corporate websites. A total of 742 job ads were collected from 233 different companies. Table 2 shows the number of ads for each state in the US. A total of 44 states and D.C. were included in the data set.

<Table 1> Korean Ads by Website

Website	Number of Ads	Percentage of Ads
incruit.co.kr	112	26.6 %
scout.co.kr	106	25.2 %
jobkorea.co.kr	105	24.9 %
recruit.co.kr	98	23.3 %
Total	421	100.0 %

<Table 2> US Job Ads by State

State	Number of Ads	Percentage of Ads
California	103	13.9%
Texas	47	6.3%
Virginia	42	5.7%
Ohio	41	5.5%
Illinois	39	5.3%
New Jersey	33	4.4%
Georgia	32	4.3%
New York	32	4.3%
Connecticut	30	4.0%
Minnesota	30	4.0%
Other 34 States and D.C.	313	42.2%
Total	742	100.0%

<Table 3> Classifications of IT Skills

Classification 1	Classification 2 [12]	Classification 3 [14]	Classification 4 [9]
Technical Skills	Computers	Technical	Arch/Network Hardware Software
	Models	Systems	Problem Solving
	Systems		Development
	Organization	Business	Business Management
Behavioral Skills	People, Society		Social

In order to analyze the ads, it was necessary to classify the skills mentioned in each ad. In previous work, many authors (e. g., [12, 14, 9]) developed classification schemes. In our analysis, we used the classification developed

by Lee [9] as it was refinement of the earlier classification schemes of Nunamaker et al. [12] and Todd et al. [14] by reflecting the increasing importance of the Internet. Table 3 juxtaposes the various classification schemes:

In the analysis of the job ads we collected, we first classified each skill mentioned according to the classification scheme in Lee [9] and then counted, for each category the number of adverts that mentioned a skill that category.

3. Results

The first thing that struck us when we inspected the various job ads was the discrepancy in the number of skills mentioned in US versus Korean jobs ads. While Korean ads mentioned on average 6.1 skill requirements, the US ads mentioned on average 19.8 skill requirements. This compares to an average of seven skills requirements listed for IT managers in newspaper ads in the US in the 1980s [14]. There has been some speculation that the dramatic increase of the average number of skills in an ad is due to the fact that the Internet allows employers to use an unlimited space for each ad while the offline newspapers charge advertising fees depending on the number of words in the ad (e. g., [5]). However, while this explanation may hold for US job ads, it certainly does not hold for Korean job ads. We return to this point in the next section.

A second observation is that there are noticeable differences in the skills that are most frequently mentioned in US and Korean ads. Table 4 gives a detailed analysis of the number of US and Korean ads that mention a specific skill, while Table 5 summarizes this data for skill categories. Neither a Wilcoxon matched-pair signed-ranks test on the

rank-ordered results in Table 4 or in Table 5 showed a statistically significant difference

<Table 4> Number of ads mentioning specific skills requirements

	Skill requirement	USA		Korea	
		# of Ads	% of Ads	# of Ads	% of Ads
Management	General Management	676	91.1%	68	16.2%
	Organisation	533	71.8%	38	9.0%
	Project Management	498	67.1%	120	28.5%
	Leadership	497	67.0%	68	16.2%
	Planning	489	65.9%	87	20.7%
	Monitor & Control	451	60.8%	11	2.6%
	Training	207	27.9%	1	0.2%
Development	General Knowledge of Development	541	72.9%	50	11.9%
	Implementation	507	68.3%	151	35.9%
	Operations/Maintenance	503	67.8%	50	11.9%
	Analysis	435	58.6%	65	15.4%
	Knowledge of General Technology	391	52.7%	43	10.2%
	Design	305	41.1%	117	27.8%
	Quality Assurance	264	35.6%	6	1.4%
	Knowledge of Methodologies	221	29.8%	54	12.8%
	Integration	199	26.8%	24	5.7%
	Documentation	169	22.8%	17	4.0%
Programming	99	13.3%	94	22.3%	
Social	Interpersonal	622	83.8%	69	16.4%
	Communication	578	77.9%	100	23.8%
	Independent/Self-Motivated	153	20.6%	8	1.9%
	English	0	0.0%	114	27.1%
Problem solving	Customer Oriented	414	55.8%	20	4.8%
	Technical Expertise	363	48.9%	54	12.8%
	Adaptive/Flexible	359	48.4%	10	2.4%
	Quantitative	347	46.8%	0	0.0%
	General Problem Solving	245	33.0%	20	4.8%
	Analytical / Critical / Logical Thinking	220	29.6%	21	5.0%
	Creative/Innovative	94	12.7%	32	7.6%
	Modeling	82	11.1%	5	1.2%
Business	General Knowledge of Business	531	71.6%	99	23.5%
	Function Specific	435	58.6%	21	5.0%
	Enterprise-wide	327	44.1%	25	5.9%
	Industry Specific	187	25.2%	45	10.7%
	Electronic Business	51	6.9%	47	11.2%
Software	Packages	401	54.0%	89	21.1%
	General Knowledge of Software	318	42.9%	94	22.3%
	OS / Platforms	252	34.0%	62	14.7%
	Database	214	28.8%	74	17.6%
	Programming Language	129	17.4%	137	32.5%
	CASE	14	1.9%	8	1.9%
Architecture/ Network	General IS Architecture	245	33.0%	37	8.8%
	Networking & N/W Devices	186	25.1%	60	14.3%
	Internet	183	24.7%	53	12.6%
	Network Security	96	12.9%	25	5.9%
	Client/Server	83	11.2%	10	2.4%
	Mainframe	72	9.7%	3	0.7%
	LAN/WAN	52	7.0%	7	1.7%
Hardware	General Knowledge of Hardware	178	24.0%	82	19.5%
	Server	111	15.0%	39	9.3%
	Desktop/PC	92	12.4%	12	2.9%
	Devices/Printers/Storage	56	7.5%	4	1.0%

<Table 5> Number of ads that refer to each category at least once in the ad

Skill Category	USA (Total: 742)			Korea (Total 421)		
	Rank	# of Ads	Percentage.	Rank	# of Ads	Percentage
Management	1	733	98.8	3	226	53.7
Development	2	731	98.5	1	289	67.9
Social	3	691	93.1	4	195	46.3
Problem Solving	4	685	92.3	8	134	31.8
Business	5	663	89.4	6	164	39.0
Software	6	604	81.4	2	251	59.6
Architecture/Network	7	455	61.3	7	152	36.1
Hardware	8	218	37.9	5	183	43.5

<Table 6> Most frequently mentioned skill requirements

Rank	USA			Korea		
	Skill Requirement	Percentage	Category	Skill Requirement	Percentage	Category
1	General. Management	91.1	Management	Implementation	35.9	Development
2	Interpersonal	83.8	Social	Programming Languages	32.5	Software
3	Communication	77.9	Social	Project Management	28.5	Management
4	General Knowledge of Development	72.9	Development	Design	27.8	Development
5	Organization	71.8	Management	English	27.1	Social
6	General Knowledge of Business	71.6	Business	Communication	23.8	Social
7	Implementation	68.3	Development	General Knowledge of Business	23.5	Business
8	Operations and Maintenance	67.8	Development	General Knowledge of Software	22.3	Software
9	Project Management	67.1	Management	Programming	22.3	Development
10	Leadership	67.0	Management	Packages	21.1	Software

between the patterns of skill requirements in US and Korean job ads. Nevertheless, it is instructive to list the top 10 list of detailed skill requirements for each country. Table 6 reports this data.

An inspection of Table 6 indicates that the majority of the top 10 skill requirements in US job ads for IT Managers address business skills

(i. e. those in the broad categories of business, management, or social), while only 4 of the top 10 skill requirements in Korean job ads do so. On the other hand, while 3 of the top 10 skill requirements for Korean job ads can be classified as technical (i. e., those the broad category of software), none of the top 10 skill requirements in US job ads fall in this broader

category. Interestingly, none of the technical skill requirements for Korean IT managers concern hardware or networking.

4. Implications

The job ad data suggest a remarkable difference between US and Korean IT managers. While companies in both countries seem to value systems-related skills in their IT managers, specifically those related to the development, design and implementation of systems (broadly labeled "Development" in the classification scheme we adopted), US companies value business skills more highly than do Korean companies, who instead seem to require a deeper technical knowledge in their IT managers, especially in the area of software. The picture that emerges is of a US IT manager who is more involved in the planning of IT applications, with relatively high responsibility for the managerial side, whereas the Korean IT manager is more involved in overseeing technical aspects. In other words, compared to the US, the emphasis for the Korean IT manager is more on "IT", whereas the emphasis for the US IT manager is more on "manager".

However, there are a number of caveats that we would like to make. First, we have already remarked on the fact that US ads list a much greater number of skill requirements than Korean ads do. Thus, US ads mention on average almost 20 skill requirements, whereas Korean ads mention just above 6 skill requirements. While there is no doubt that the Internet has been a factor in the proliferation of skill requirements in US job ads, Korean ads have not followed suit and contain a small number of skill requirements that is remarkably similar to the number in US newspaper ads in

the late 1980s. The large number of skill requirements in US job ads is worrisome for our research as it may well be the case that the US job ads include both skills that companies deem absolutely necessary for IT management positions, as well as skills that they consider merely desired. The difference in the number of skill requirements between US and Korean job ads therefore requires an explanation.

One set of explanations for the difference in the number of skills mentioned in jobs ads from US and Korea may lie in the differences in recruitment practices between the two countries, and particularly in the role of job ads in the recruitment process. For example, it may be the case that employers in South Korea do not think of their job ads as gate keepers to preventing unqualified applicants from applying for jobs. The relatively small size of the country allows job seekers and employers to meet face-to-face at a relatively low cost. Another explanation may lie in the more legalistic nature of the US compared to South Korea. US Companies may simply include more skills in their job ads in order to protect themselves against possible litigation by rejected jobs applicants. The more skills are listed in a job ad, the greater the chances that a particular candidate will not have one of the skills mentioned and the easier it will be to justify a particular candidate's rejection because he or she does not meet the job requirements documented in the job ad. However, whatever the explanation is, the question remains whether the differences that we have found between the two countries are simply an artifact of the fact that US firms list both required and desired skills, whereas Korean firms list only the required.

In light of the question under consideration, namely do the online US job ads for IT

managers include many desirable, rather than required, skills, the most striking finding is that US companies, according to the analysis of newspaper ads conducted by Todd et al. [14] favored management skills as highly in 1990 as they did in the new millennium. In other words, it indicates that the relatively frequent mention of skills in the management skill category in US online job ads in the new millennium was not merely an artifact of the fact that the online medium allowed companies to include many more skills at little or no additional cost. We therefore believe that our conclusion that, compared to the US, the emphasis for the Korean IT manager is more on "IT", whereas the emphasis for the US IT manager is more on "manager" can be dismissed simply as being the result of the difference in the number of skill requirements listed in US and Korean job ads.

Another potential shortcoming of our study is that, in our analysis of our job ads, we only looked at the skills that were explicitly listed. However, it may well be due that companies exclude those skills in their job ads that they expect everybody in the applicant pool to have. Thus, US companies do not list command of the English language as one of the skill requirements for IT managers, whereas Korean firms do. The obvious explanation for this is that US firms can reasonably expect their jobs applicants to be fluent in English whereas Korean firms cannot. In a similar vein, it may well be the case that Korean firms do not consider it necessary to list business related skills in their job ads for IT managers, simply because they expect applicants for such positions to have these skills. Similarly, US firms may not find it necessary to give prominence to technical skills in their job ads for IT managers as they believe all applicants for such positions have the required technical

skills.

While we can probably reject the second set of explanations at least as far as Korean firms are concerned because there seems to be no discernible reason for Korean firms to believe that all applicants for IT manager positions should have business skills, there is at least the possibility that US firms expect their applicants for IT manager positions to have the required technical skills. For example, US firms may specify that applicants for IT manager position must have a certain number of years of experience in positions that demand high level of technical skills or that they have a specific formal degree, such as a undergraduate university degree in Computer Science. This clearly leads to a further question that we intend to pursue in future research: Are there significant differences between US and Korean job ads for IT manager positions as far as degree requirements or expected prior job experiences are concerned? If so, what are they?

A final caveat concerns the differences between the US and Korean firms whose job ads we included in our study. Recall that we collected the Korean data from four commercial job ad sites, whereas we collected the US data from the web sites of Fortune 500 companies. In general, the US jobs ads therefore come from larger firms, whereas the Korean ads come from a variety of firms. Intuitively, it also seems reasonable to expect that there are differences in the job requirements for IT managers between large and small companies. For example, it is not unreasonable to expect an IT manager at a small company to be less exclusively focused on management. Smaller firms simply cannot afford to hire a specialist, technical or otherwise, for each specific component in their IT applications, and it is for example not unlikely that a network

administrator in a small firm will also have direct responsibility for the design and implementation of network security procedures and policies. Since larger firms can afford to employ more people, they are more likely to be able to hire more specialized IT professionals, including a more specialized IT manager. In other words, the IT manager in a small firm is more likely to be a generalist IT professional, rather than a specialized IT manager, and will therefore have to possess both technical and managerial skills. Again, this leads to a set of further questions that we hope to address in subsequent research, namely are there differences in the skill requirements for IT managers between small and large IT firms, and are these differences, assuming they exist, similar for US and Korean firms, or are there noticeable differences between IT managers in Korea and the US, independent of the size of the company that they work for?

5. Conclusions

The results reported in this paper suggest that there are significant differences between Korean and US firms when it comes to their IT managers. In brief, Korean firms emphasize the importance of IT skills for IT manager position, while US firms put a greater emphasis on business and management skills. However, there are a number of caveats that we need to place on our findings. First, US firms mentioned a considerably higher number of skills in their ads for IT manager positions, which may have meant that they included both required and desirable skills in their ads, thus providing a less clear focus than the Korean ads. Second, it is possible that US and Korean firms made different assumptions about the skills that they could expect applicants for IT

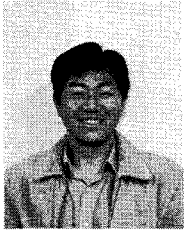
manager position to possess. Third, the US firms in our sample were all large firms, whereas the Korean sample contained a mix of large, and small and medium sized companies, and there is the possibility that our findings were skewed by this. We intend to conduct research in the future to address each of these issues.

The differences that we observed between the skill requirements for IT managers between Korean and US firms, assuming of course that our further studies confirm our results, have great potential implications for both educational institutions and individual firms. As globalization takes a stronger foothold, it is likely that students trained in one country will find employment in another or that companies in different countries will establish closer working relationships, especially with firms in strong fast growing economies, such as South Korea's. Clearly, educational institutions that wish to prepare their graduates for the international job market benefit from a better knowledge of the skill expectations that companies in different countries have for particular positions, and firms engaging in business negotiations aimed at establishing long term relationships benefit from a better understanding of the backgrounds, skills and knowledge of their potential business partners. The current study provides some initial insights in the likely skill differences between IT managers in Korea and IT managers in the US.

References

- [1] Broadbent, M., Lloyd, P., Hansell, A., and Dampney, C. N. G. (1992). Roles, responsibilities and requirements for managing information systems in the 1990s. *International Journal of Information Management*, 12(1), pp.21-38.

- [2] Chen, H., Miller, R., Jiang, J., and Klein, G., (2005). Communication skills importance and proficiency: perception differences between IS staff and IS users. *International Journal of Information Management*, 25(3), pp.215-227.
- [3] Couger, J. D., Zawacki, R. A., and Oppermann, E. B. (1979). Motivation levels of MIS managers versus those of their employees. *MIS Quarterly*, 3(3), pp.47 - 56.
- [4] Delaney, C. (1985). The development of technical managers. *Journal of Information Systems Management*, 2(1), pp.73-76.
- [5] Gallivan, M. J., Truex, D.P., and Kvasny, L. (2004). Changing patterns in IT skill sets 1988-2003: a content analysis of classified advertising. *ACM SIGMIS Database*, 35(4), pp.64 - 87.
- [6] Gibson, C. F. (1973). Organizing and managing computer personnel: conceptual approaches for the MIS manager. In Proceedings of the 11th Annual Computer Personnel Research Conference, pp.19 - 45, ACM Publications, College Park, Maryland.
- [7] Ives, B. and Olson, M. H. (1981). Manager or technician? The nature of the information systems manager's Job. *MIS Quarterly*, 5(4), pp.405-406.
- [8] Lee, S. M. and Lee, C. K. (2006). IT Managers' Requisite Skills. *Communications of the ACM*, 49(4), pp.111-114.
- [9] Lee, C. K. (2005). Analysis of skill requirements for systems analysts in Fortune 500 organizations. *Journal of Computer Information Systems*, 45(4), pp.84-92.
- [10] Lee, C. K., Yoo, S. J., and Reichgelt, H. (2005). Skill Requirements for Information Technology Managers in South Korea. *Information Systems Review*, 7(2), pp.129-139.
- [11] Morris, M. G. and Bartczak, S. E. (2000). IT skills in the public sector: comparing the views of middle managers and their supervisors. In Proceedings of Americas Conference of Information Systems, pp.1963-1967, AMCIS Publications, Long Beach, California.
- [12] Nunamaker, J. F., Couger, J. D., and Davis, G. B. (1982). Information systems curriculum recommendations for the 80's: undergraduate and graduate Programs—A Report of the ACM curriculum committee on information systems. *Communications of the ACM*, 25(11), pp.781-805.
- [13] Stokes, S. L. (1991). The new IS manager for the 1990s. *Journal of Information Systems Management*, 8(1), pp.44-50.
- [14] 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), pp.1-24.
- [15] Willard, P. and Mychalyn, J. (1998). New information management work in a changing world: an Australian survey. *International Journal of Information Management*, 18(5), pp.315-327.



이 충 권 (Choong Kwon Lee)

- 계명대학교 경영정보학과를 졸업
- 미국 University of Nebraska-Lincoln에서 MIS전공으로 Ph.D 취득

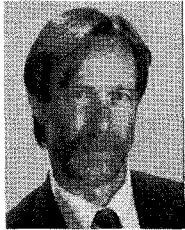
- 미국 Georgia Southern University에서 조교수로 근무
- 현재 계명대학교 경영정보학과에서 조교수로 재직
- 주요관심분야 : Job Skills for IT Professionals, IS/IT의 전략적 활용



유 상 진 (Sangjin Yoo)

- 서강대학교 물리학과와 경영학과를 졸업
- 미국 University of Nebraska-Lincoln에서 MIS전공으로 Ph.D 취득

- 미국 Bowling Green State University에서 조교수로 근무
- 현재 계명대학교 경영정보학과에서 조교수로 재직
- 주요관심분야 : IS/IT의 전략적 활용, 경영혁신, e-Business, 벤처창업과 성장전략 등



Han Reichgelt

- Bachelor's Degree from the University of Nijmegen in the Netherlands
- Ph. D in cognitive science from the University of Edinburgh in Scotland

- Dean of School of Computer and Software Engineering in Southern Polytechnic State University
- Chair of the ACM Special Interest Group on IT Education
- Research interests : IT and economic development, IT application delivery quality, and computing education.