Internet based job competency development system for small IT business

Eunsoon Cho
Department of Education
Mokwon University, Daejon, South Korea

ABTRACT

This paper designed and developed internet based competency developing system for small IT (Information & Technology) companies. The purpose of this system was to provide career development opportunities to small IT business workers for their longstanding employment and self-improvement job skills. This study analyzed job competencies based on job descriptions from two IT companies. The survey was conducted to analyze employees' self-assessed current job competency level and effective ways of improving their current level of competencies. From the results of survey, most of subjects indicated their job competencies were in between mid-level to low level, and they required the need of training programs to improve their job knowledge and experience. Based on the interview from field experts about job competency development, this study designed and developed the internet based competency development system to provide effective and efficient way of improving job competencies and needed training programs for small IT business employees.

Key words: competency development system, competency based training program

1. INTRODUCTION

The research about job competencies in terms of performance improvement has been ongoing interests both in academic areas and business workplaces [1]-[4]. Researchers usually define competency as personal capabilities containing fundamental knowledge, ability, and expertise in a specific subject area or skill set [5]-[7]. Competency is sometimes used as an interchangeable term as capabilities, however at the particular setting such as in business and industry. Core competencies are more likely to use in producing technologies and/or improving performance skills [4],[8]. Most of business environments emphasize on employees' core competencies in their jobs, and are willing to provide training opportunities to improve their work performances because workforce environment always demands more changes toward efficiency, productivity, profitability, and competitiveness [8],[9]. The more individual competency connects to competitive power of organization, the better effective and efficient prescription should be provided to workplace employees to set up future action plans in work environment. However, business organization does not consider personal differences in competency developing phase and skills, therefore each employee should accept organizational forced competencies on their position no matter how they are confident on developing required knowledge and skills.

Most of big corporations have their own customized competency development system which individual employee can easily monitor themselves and manage their past, current, and future competency improving phases and training action plans [10]. However, small companies are having difficulties in developing their own competency system due to system developing time and budget limits. This results that HR(Human Resources) planning stays in low level of work performance and skills [11]. Especially most of IT companies in Korea are relatively in small size having between 30 to 80 workers. They are also suffering from providing training opportunities to employees and guiding career plans due to high turnover rate and rapidly changing business environment. This phenomenon also results in underdeveloped job competiveness in small IT business industry. From the research about Korean small IT business case analysis of job competency, employees in small size IT business showed low confident in their job competencies and needs of improving their job expertise [12]. When considering highly developed internet culture and educational passion in Korea, providing career development opportunities and its subsequent training programs to small size IT employees can cultivate competent IT experts for a long term base.

The purpose of this study was first to analyze what were the major job categories and their required competencies in small IT business, and next to design and develop the internet based competency development system to guide employees optimum career path to improve their work performance. Employees can get promotion with support of this system and receive training opportunities through internet. This study limits the design and development of internet based

---

* *Corresponding author. E-mail : echos@mokwon.ac.kr*

competency development system only for small size IT workplaces.

2. COMPETENCY ANALYSES

To examine employees' current job competency level and desirable career path, two IT companies were selected based on organizational structure such as administration, technology, and marketing. Both business duration and number of all employees in each work division were also considered to gather enough information that was required in this research. Below is the repurposed competency analyses results from the initial study presented by Cho [12]. Overall this study developed and elaborated the details of competency analyses and core concepts of system design and development based on the research by Cho.

The questionnaire was distributed to 75 employees in two IT companies between 2008 and 2009. After three times of distributing questionnaire, 55 subjects were finally collected. Collecting more samples was difficult in two companies because most of workers often worked away from the offices for marketing their products. Some of the subjects quitted their job during collecting questionnaire.

The subjects were asked what career paths they should go through to be an executive in three major job categories such as administration, technology, and marketing. The subjects were also asked about self-assessed current job competency level. The other questions were the required time to get promotion as an executive, competency development ways such as training and development, and job positioning and incentives. They were also asked self-drawing desirable career development paths for their future work.

Table 1 shows the results of time required to be an executive officer in IT companies. 52.7% of employees answered 5 to 10 years and 34. 5% responded that it would take more than 10 years to be an executive. The subjects who did not answer on this questions were assumed that there would be unexpected factors such as secretly nomination by owner and/or recruiting by scout.

Table 1. Time needed to be an executive

years	number	%
Less than 5 years	1	1.8%
5 to 10 years	29	52.7%
More than 10 years	19	34.5%
No answer	6	10.9%
total	55	99.9%

Table 2 shows major job duties and positions to be an executive officer in each job category. The duties in administration department are finance, accounting, and personnel affairs. The important positions are chief, assistant manager, manager, assistant director, director, and executive. Technology division has mostly technology R & D duties in their job. Job duties in marketing department are more oriented in marketing and sales of their technologies and products. Positions employees should

go through, are about the same as in administration department. There was a suggestion that job rotation could be recommended to understand more and better overall work duties before an executive.

Table 2.. Major job duties and positions

Department	Duties and positions
Administration	• duties: finance, accounting, personnel • positions: chief, assistant manager, manager, assistant director, director, executive
Technology	• duties: technology planning, R&D, technology management, • positions: team member, team leader, assistant director, director, executive
Marketing	• duties: business planning, marketing & Sales, business administration • Positions: assistant manager, manager, assistant director, director, executive, CEO
others	• Need to rotate in each job department before being an executive

From the analysis of self-assessed current job competency level, table 3 indicates that only 9.1% of employees show high confident on their current job performance, and 20% of employees in low level. 67.3% of workers thought that their competencies were in intermediate level.

Table 3. Self-assessed job competencies

level	number	%
low	11	20.0
mid	37	67.3
high	5	9.1
n/a	2	3.6
total	55	100

Table 4 shows the results of question on what kind of solutions are effective to improve IT workers' insufficient job competencies. The table shows that 30.9% of subjects suggests that training is the most effective way to improve their current job competency, and next job positioning, incentives, and promotions consecutively. Subjects marked on multiple items in rank order.

Table 4. Effective solution to improve competency (in rank order with multiple responses)

solution	Rank 1	%	Rank 2	%	Rank3	%
T&D	23	30.9	13	23.6	6	12.7
Job positioning	17	18.2	13	23.6	9	16.4
Incentive /promotion	10	41.8	9	16.4	6	10.9
other	3	5.5%	0	0.0	0	0.0
n/a	2	3.6	20	36.4	33	60.0
total	55	100	55	100	55	100

3.   JOB HIERARCHY ANALYSES

To analyze job competency hierarchy based on job description, first this study thoroughly examined previously conducted job description analyses in two companies with their special permission. Two companies had analyzed job descriptions in three major job divisions for their own purpose. This study also interviewed SM E(Subject Matter Expert)s in three divisions to draw the departmental competency hierarchy in terms of time needed, required knowledge, and skills to get promoted. SMEs also suggested optimum career paths for each department based on their own work knowledge and experiences.

After making draft of competency hierarchies, a couple of SMEs in each division were selected to review and revise them. Figure 1, 2, and 3 show bottom up flowchart of functionally required knowledge and skills in each job department that were highly recommneded to be the tops. They also show the optimum time be an expert in each division. In figure 1, newly recruited employees should practice network basics and programming for at least one to three years to move forward to next job competency. To be an expert in technology department, workers should practice and experience algorithm, structure, and network management for certain years in their workplace. Figure 2 shows the same logics to go up to the top manager from incoming employee. Figure 3 also indicates that what and how long employees should experience to be an executive in IT marketing division.
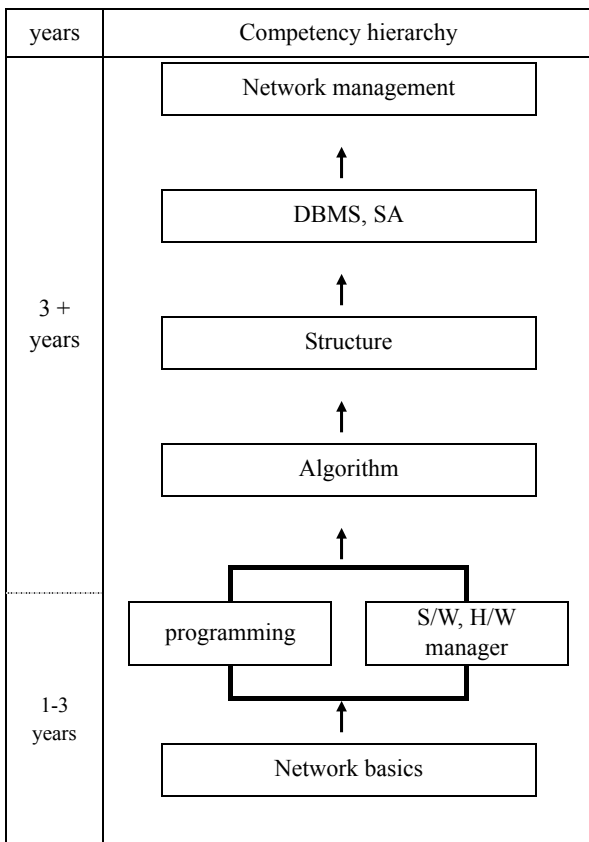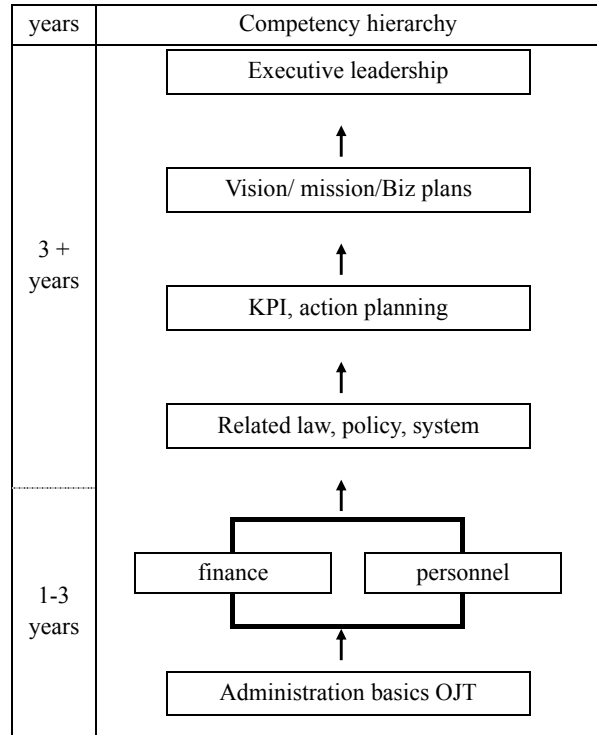

Fig 1. Competency hierarchy in technology

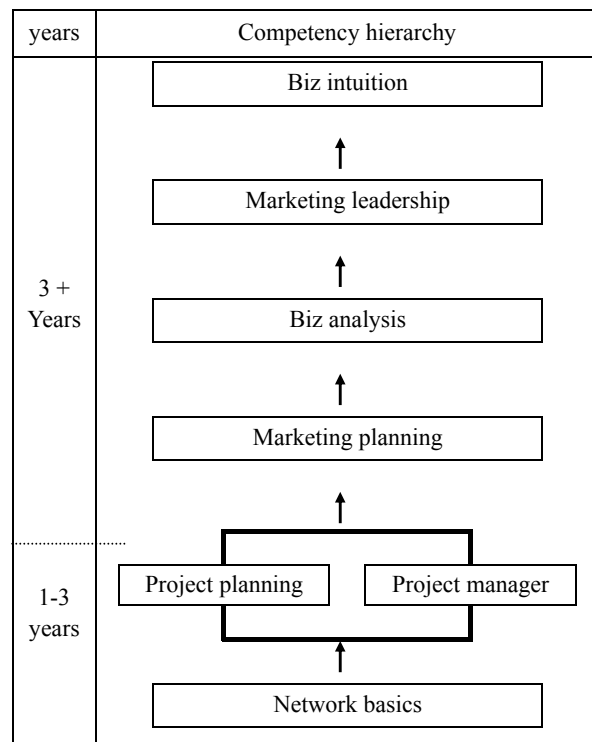Fig 2. Competency hierarchy in administration

Fig 3. Competency hierarchy in IT marketing

4.   SYSTEM   DESIGN & DEVELOPMENT

From the results of the survey analyses, job description, and SME interview, this study designed and developed internet based competency development system for small IT business.

Figure 4 shows the framework of the system which contains flowchart type functions designed and developed in this study. The system starts from each employee's job experience and his/her training history. The system can also analyze employee's aptitude test result to diagnose his or her job interests and career path for the future. The aptitude test result can be brought from the system automatically if each employee takes the test on the system. If he or she already has taken in different place, the result can be inserted into the system.

After each employee selects his/her own job category to go through, he/she should be assessed current level of job competency to set up his/her future action plans. The system designed to provide diagnostic job competency test before the system guide career and performance development plan, and learning & training plan based on selected job category. Once the system has proper information about employee's aptitude test and job competency results, the system provides personal career development plan including departmental and divisional career goals to achieve in the future. This system is also able to revise employee's personal and departmental information changes in any time. Repositioning is a very important factor in this system to provide reset function to restart the system use for any purpose.
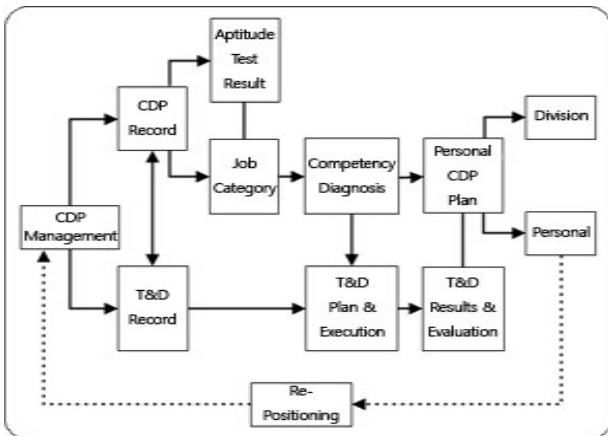

Fig 4. Framework of the system functions

Figure 5 shows the main screen of competency based career development and training support system developed in this study. Users can start from checking their aptitude management function and insert the result to total career management system to find out their desirable career road and recommended competency to improve and what kind of training program to receive.

Fig 5 Main screen of the system

Figure 6 shows how each employee can plan his/her career path based on work experiences and competencies that he or she has accumulated from current and past work experiences. As each employee inserts his/her proper information, the system will guide optimum action plans for the employee to follow. The system integrates individual career plans, past work experiences, and current level of competencies and training records. Later the system will show what the core competencies are to improve, and which training programs employee should take for their future job competency.

Fig 6. Individual career planning screen

Figure 7 is about the comprehensive career development management including work experiences, former positions, current job competencies & duties, and training records. This screen can be accessed by both division and each person, so it is convenient to monitor employee's training and work experiences when it is needed. The information on this screen is very crucial key indicators for each employee to get promoted and to change career path because the organization will review the information prior to making decision of one's positioning and incentives.

Fig 7. Comprehensive career management screen

Figure 8 shows employee's training records and performance development plans based on his/her career experiences. Each team or department can insert its private information on conducted project results and near future work plans for team members. Based on these information, the system shows how each team and/or department members can use training opportunities to improve job competency with consideration of time and budget. The system will guide appropriate e-learning

programs and/or other options to provide more chances to each team members. The system also connects with outer systems to provide more various e-learning programs to users.

Fig 8. Training and Development records and plans

5. CONCLUSION

The purpose of this study was to analyze job competencies in small IT business and to develop competency based career development system providing optimum guidance to IT employees for their career action plans, and training & development programs based on each employees work experiences and job competencies. This study designed recommended career paths from the analyses of survey and job descriptions in three major job categories from two IT companies. SME interview was also conducted to draw the best desirable career map to follow and to improve work performances and job competencies.

The results showed that most of employees were not confident on their current job competencies. They indicated that providing more opportunities for job training was the first solution to improve their current competency level. Job positioning was also important factor to level up their competencies. The career development system developed in this study is able to plan one's career and training based on employees' aptitude test result and work experiences. It can also guide the worker's future career plan based on his/her personal history on work and training. As the system starts from aptitude test result, it provides the optimum guidance to improve employees' job competencies and work performance and future career plans as well.

This study concludes that this system provides the practical tool to plan and improve small IT business workers' job competencies including desirable career path and training opportunities. The system can monitor and improve not only individual worker's competency, but also organizational competency. Therefore, IT companies are able to cultivate highly competitive employees to increase high level technology knowledge and field experience. Marketing and management competencies in IT business are also main competencies to assist core IT technology to lead to successful business. This system also support those functions in small IT business. Finally this study suggests that the modification of this system is needed to fit the system into individual company's unique organizational culture and competency when adopting the system. Also, there must be a system manager or counselor to guide employees how to utilize the system and continue to improve job competencies for their future career plans.

REFERENCES

[1] Mitchell, G.R. "The changing agenda for research management". *Research Technology Management* (Set/Oct), 1992, pp 13-26.

[2] Morone, J. *Winning in high tech markets*. Boston, MA: Harvard Business School Press. 1993.

[3] Walsh, S., Boylan, R., Paulson, A., & Morone, J. "Core capabilities and strategy: empirical evidence from the semiconductor silicon industry". *SMS Strategic Integration,* 1996, pp. 149-167.

[4] Walsh, S., & Linton, J. D. (). "The measurement of technical competencies". *The Journal of High technology management research.* Vol. 13, 2002, pp 63-86.

[5] McLagan, P. *Models for HRD practice*. Alexandria, VA: The American Society for Training and Development. 1989.

[6] Rothwell, W., Hohne, C., & King, S. *Human Performance improvement: building practitioner performance.* Oxford, UK: Elsevier Pub., 2007.

[7] Ulrich, D., Brockbank, W., Johnson, D., Sandholtz, K., & Younger, J. HR competencies: *Mastery at the intersection of people and business.* Alexandria, VA: Society for Human Resource Management. 2008

[8] Gandolfi, F. "The mean and lean firm: the latest in reductions in force". *Ivey Business Journal.* http://www.iveybusinessjournal.com/article.asp?intArticleID=803, 2009.

[9] Prahalad, C. K., & Hamel, G. *The core competence of the corporation*. Harvard Business Review, Vol. 3. 1990, pp 79-91.

[10] Pfeffer, J. *Competitive advantage through people: unleashing the power of the workforce*. Boston, MA: Harvard Business School Press. 1995.

[11] Jeon, Y., Byun, H., & Lee, J. (). "Development and application of program planning model for job competency-based performance improvement in organizations". *Korean Journal of Corporate Education.* Vol 8. No 2.. 2006, pp 79-100.

[12] Cho, E. "Development of a competency based e-learning system: case analysis of Korean IT business". *In the proceedings of IMSCI, 2009.*

Eunsoon Cho, Ph.D.
She received her doctoral degree from University of Connecticut in 1992. She worked for Aetna Group in U.S. from 1992-1993 and POSCO Research Institute as a senior researcher from 1994-1999. Currently, she is a professor at the department of education, Mokwon University in Deajon, South Korea. Her interests are in e-learning and HRD.