Study an ICT Professional in Computer Network Competency Factors from Undergraduate Studies in Thailand

Arrom Eampraserth
Sripatum University
61 Phaholyothin Road Jatujak, Bangkok 10900, Thailand.
Arrom.ea@gmail.com

Kittima Mekhabanchakij
Sripatum University
61 Phaholyothin Road Jatujak, Bangkok 10900, Thailand.
kittima.me@gmail.com

Abstract - Computer Network is a very significant field of study for professional work in ICT industry (Crnkovic, 2003). A study of Kirida, et. al. (2008) has revealed that there was a problem in ICT profession in Computer Network, caused by the labor shortage in ICT, which has afflicted the economy progress. The finding also extended that the total skill deficiency in Thailand had risen up highly to 30% and 38% in 2004 and 2007 respectively. It was also noted that labor shortage in Thai industrial sector was more severe than many other countries. One of the main problems in Computer Network education is “hard to understand” learning materials and lack of proper learning tools.

To overcome these problems, it is important to find out what factors determine the competency of Computer Network professionals. This should help improving quality of the graduates suitable to the industry needs. This paper has defined a Competence Deficiency matrix of ICT focusing on Computer Network; based on National Quality Standard (NQS) and Thailand Quality Framework (TQF) of ICT study as defined by the Office of the Higher Education Commission (OHEC); as well 3 rounds of nationwide survey research of Computer Network academia.

The Competence Deficiency matrix of ICT will be useful for ICT academia in improving quality of graduates accordingly.

Keywords - Competence Deficiency matrix of ICT, Computer Network Competency Factors, Computer Network Competency Model, ICT Professional

I. INTRODUCTION

Computer network instruction in Thailand’s universities, these days, plays an important role in industrial and trade sectors, government organizations, research, education, medicine, communication network system, entertainment business and et cetera. Design-aided profession, development, analysis, qualification defining, result warranty, maintenance and appraisal of results that are greatly different with the use of ICT in terms of the study of the standard curriculum of Association for Computing Machinery (ACM, 2005) [1] to be widely accepted focusing on competence and knowledge base in profession and study of computer network is very important and crucial for ICT profession (Crnkovic, 2003). Computer network is one of the subjects contained in several of computer science, computer engineering, information technology, and business computer curricula since it is crucial part of ICT system.

The problem of Computer Network instruction is difficulty for learners to understand. Chung’s research found that contents about theory and technique were...
largely focused and there were lacks of equipment, so it was not interesting to study (Chung, 2007) [3]. Colin and et al. (Colin, 2009) [4] found that learners of this subject could not practice as taught or did not have sufficient time and did not have activities that related to instruction medium. In addition, David (2003) discovered that one of the problem was learners did not have prerequisite knowledge background necessary for the instruction.

The objective to develop computer network competency model is to indicate competency of computer network profession of universities in Thailand. Normally, the main objectives of universities are to develop learners to possess knowledge in this filed, so the universities have provided standard instruction. The majority of them uses ACM 2005 Standard. The university graduates should be able to conduct their profession efficiently.

II. MOTIVATION FOR THE STUDY

Requirement of computer network profession is reflected in Kirida et al.’s work (2008) that lack of skilled labor was a major obstacle to economic development. Thailand ranked the second in lack of labor counting for 38% in 2007 and 30% in 2004 next to Brazil. This can be seen that Thailand took longer period to recruit labor for production process at the rate of 5.2% compared with Korea’s which was 3.4% and Indonesia’s which was 1.6%. The reason why it took such a long period is because applicants did not possess qualifications required by employers such as lack of English literacy at the rate of 90%, lack of information technology and ICT skill at 82%, calculation skill at 60%, creativity at 45% and leadership at 43%.

III. STANDARDIZED BASED FOR THE STUDY - COMPUTER NETWORK PROFESSION

A. European Standards

The computer network competency for persons who work in this field is defined by EUCIP to consider knowledge and ICT competency of system administrators. It was found that graduates in this field who will work in this position must possess necessary knowledge and competency as follows:

- Network Fundamentals
- Installing software
- Installation and Configuration
- Manage users and groups accounts
- Create and manage shared resources and account permissions
- Manage Network Printers
- Security and protection
- Utilities
- Sharing Internet Services
- Internet connections
- Configuration and Upgrading
- Diagnosing and Troubleshooting

B. United States Standards

One of the well-known organizations of ICT standards in the United States is Computing Technology Industry Association (TIA) which sets up knowledge base and competency for ICT and computer network professions including relevant jobs. The competency is considered from competency and techniques necessary for the profession such as knowledge basis and management ability to maintain the network to be secure and stable. Moreover, the knowledge covers technology of network and data communication and media for communication and connections for network such as tools, management, and equipment. Also, it helps support experience or skill augmentation for people in this profession.

C. Research in China

The research conducted by Liyang et al. (Liyang, 2010) [15] found that computer network profession was indispensable for industrial sector which, in developing countries, required 600,000 - 1,000,000 positions.

D. Research in Thailand

The research by Utakrit (Utakrit, 1999) [20] found that computer network instruction in high vocational level in Thailand was to prepare learners to develop knowledge and skills for work and study in higher level including short courses. This is in accordance with the study by Kirida et al. (2008), which stated that lack of skilled labor was a major obstacle to economic development. Thailand ranked the second in lack of labor counting for 38% in 2007 and
30% in 2004 next to Brazil. This can be seen that Thailand took longer period to recruit labor for production process at the rate of 5.2% compared with Korea’s which was 3.4% and Indonesia’s which was 1.6%. The reason why it took such a long period is because applicants did not possess qualifications required by employers such as lack of English literacy at the rate of 90%, lack of information technology and ICT skill at 82%, calculation skill at 60%, creativity at 45% and leadership at 43%.

Standard of instruction in high education level for Computer Network field by the Office of the Higher Education Commission (Thai Qualifications Framework - TQF) has defined framework for high educational institutions to develop or review curricula, instruction arrangement and educational management quality development to produce qualified graduates for degree certification and profession in computer network field.

IV. RESEARCH QUESTION
What are factors that set computer network competency from undergraduate curricula according to professional standard?
What is and what should computer network competency of current students be? What are differences between them?

V. RESEARCH MODEL

VI. CONCLUSION
Overcome after Focus Group of computer specialists and educational technology. There are 70 surveys on computer network instruction in undergraduate level of 3 universities group totally 70 institutions. The survey result is divided into following factors:
1) Curriculum has factors of Credit – Hours, Credit Lab - Hours and TQF.
2) Support Tools has factors of No. PC: Student, No. Computer Room/ Lab and No. Students: Faculty.
3) Faculty has factors of Experience, Bachelor Degree, Bachelor Degree and PhD. Degree.

The Computer Network Competency in the future should be learning by doing to attract learners and make them understand and enjoy the subject rather than purely giving lecture. Instruction of this field should employ technique and tools to help learners see how the equipment works. This is found to receive more attention from learners. Practice in this subject is also important. It was found that instruction focusing on practice and self exercise could encourage the learners to jointly do activities and become more motivated. Computer Network instruction in high vocational level in Thailand prepares the learners to develop their knowledge base and skills for work and continued study.

REFERENCES
[16] Minnesota State Colleges and Universities. 2010. —IT Sector Competency ModelINDUSTRY-DRIVEN COMPETENCY MODEL FRAMEWORK.”