AN EMPIRICAL INVESTIGATION ON THE REQUIRED ICT COMPETENCY READINESS TOWARDS THE DIGITAL ECONOMY IN THAILAND

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ABSTRACT. This research addresses on the Thailand ICT readiness towards the Digital Economy which ICT HR competency will be a key factor to drive the country achieve the goal. The in-depth interview with the experts in the 5 areas, such as academic, ICT service/industry, business, government and foreign investment sectors, specifies the required competencies which consist of not only knowledge and skills but also attitudes which are the important part. From the study, the ICT competencies in the proposed ICT HR Competency Development Model are required by the 5 key sectors while the specific ICT competencies which are important to each sector are also explored. The results of this research will help prepare ICT workforce to drive Thailand to be ready for the Knowledge-based Economy.

Keywords: ICT competency, digital economy, knowledge-based economy, knowledge-based service economy

INTRODUCTION

At the 13th ASEAN Summit on 20 November 2007, the ASEAN countries aimed to increase the region's connectivity and competitiveness, strengthening on human resource cooperation, particularly on regional standardization of ICT human capital competencies to increase knowledgeable and versatile workforce in efforts to build an inclusive knowledge-based ASEAN Community in 2015 (ASEAN, 2007).

Kefela (Kefela, 2010) noted that most ASEAN leaders and governments have embraced visions of developing a knowledge-based economy and a knowledge society as a way to achieve parity with western nations. These also include the countries like Malaysia, Singapore, Philippines and Thailand.

Particularly Thailand, in November 2014, t**he government announced the five themes** of the program which are hard infrastructure, soft infrastructure, service infrastructure, promotion and innovation, and society and knowledge **to make the country a "digital economy.** The government expected that the digital economy would strengthen the country and drive it forward in the region (Nation, 2014). This also corresponds to the Thailand ICT2020 Policy Framework aiming to lead Thailand towards a knowledge-based economy and society by using ICT as a driving force to create knowledge, creativity and innovation in goods and services. The important aim of the strategy is to allow Thailand to have sufficient high-quality manpow-

er that is capable of developing and using ICT efficiently in order to be prepared for national development in the era of the service economy and creative economy (ICT2020, 2011).

As noted, the ICT human resource development to build workforce with the right competencies to be capable enough to develop and use ICT efficiently will be a key success factor to bring the nations in the region including Thailand towards the Knowledge-based Economy.

In this research, the objectives of the study are the followings:

- To identify which ICT competencies are required to drive the country towards the Knowledge-based Economy.
- To identify which the specific ICT competencies are important to each sector.

THEORETICAL BACKGROUND

Defining Knowledge Based Economy/Knowledge Economy/Service Economy/Knowledge Based Service Economy/Digital Economy

The term Knowledge Based Economy (KBE) was first coined by OECD and defined as "economies which are directly based on the production, distribution and use of knowledge and information" (OECD, 1996). Choudaha (Choudaha, 2008) used the terms such as knowledge economy, service economy, new economy, and knowledge-based service economy interchangeably. The term refers to the nature of economy that involves service interaction, complex problem-solving and technology or information based transactions. Turban (Turban et. al. 2005) defined "What is Digital Economy" is the information and entertainment products that are digitized including processes and services which are performed in this way as well. Other names of Digital Economy are Internet Economy, Knowledge-based Economy, Network Economy, Web-based Economy and New economy. Thus, this paper will refer the term Knowledge Based Economy to the terms "Service Economy", "Knowledge Based Service Economy" and "Digital Economy".

Defining Competency

A competency is the capability of applying or using knowledge, skills, abilities, behaviors, and personal characteristics to successfully perform critical work tasks, specific functions, or operate in a given role or position (Ennis 2008). The iceberg model for competencies (Spencer & Spencer, 1993) takes the help of an iceberg to explain the concept of competency. Similarly, a competency has some components which are visible like knowledge and skills but other behavioral components like attitude, traits, thinking styles, self-image, organizational fit etc are hidden or beneath the surface as shown in Figure 1.

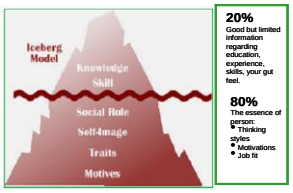

Figure 1. Competency Ice Berg Model (Spencer and Spencer, 1993)

Defining ICT Competency Model for Knowledge-based Service Economy

In this research, the U.S. Department of Labor (DoL) IT Competency Model (US DoL, 2014) in Figure 2 (left) which includes three layers of soft skills and workplace ready competencies: Personal Effectiveness (Layer 1), Academic (Layer 2) and Workplace (Layer 3) which have been generally validated by DoL work across other industries. In layer 4, the model rep-

resent the knowledge in ICT in 8 areas while layer 5, layer 6 and layer 7 represent industry technical, occupation specific requirements and management competencies accordingly.

As per the competencies proposed by Choudaha (Choudaha, 2008), with knowledge set in vertical part and skills and attitudes set in horizontal part, the Competency model for a service scientist/T-shaped professional in Figure 2 (right) should well correspond to the demands on competencies of knowledge-based service sector.

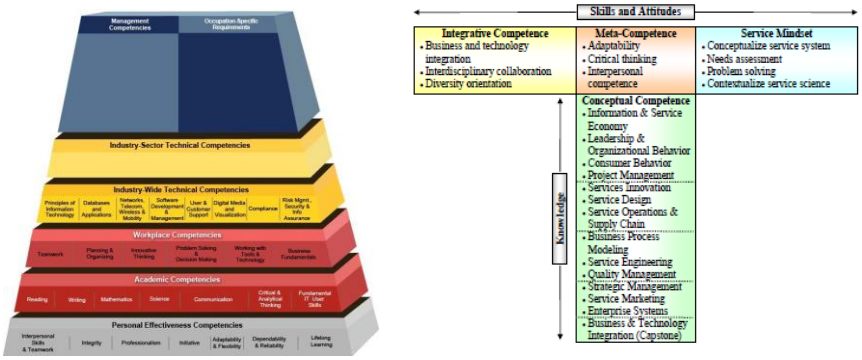

Figure 2. ICT Competency Model of U.S. Department of Labor (left) (US DoL, 2014) and Service Scientist Competency Model (right) (Choudaha, 2008)

In 2011, the Ministry of Education announced the Thailand Quality Framework (TQF) Computer standard as a foundation of education system in the country which covered in 5 majors including 1. Computer Science, 2. Computer Engineering, 3. Software Engineering, 4. IT (or ICT) and 5. Business Computing focusing in the areas of organization and ICT systems, technology for applications, technology and software process, ICT Infrastructure and Hardware and Computer Architect. The TQF Standard also defines competencies in 5 areas including Morals and Ethics, Knowledge, Cognitive Skills, Interpersonal Skills and Responsibilities and Numerical Analysis, Communications and Information Technology Skills which also aligned well with the competencies in each layer of the U.S. Department of Labor (DoL) IT Competency Model. The TQF standard also complies with the Association for Computing Machinery (ACM) and the Association for information Systems (AIS) and the Institute of Electrical and Electronics Engineer Computer Society (IEEE-CS) (TQF Computer, 2007). In this research, the US DoL IT Competency Model will be used as a foundation ICT Competency Model while the TQF Competency Model which is the core ICT knowledge along with ICT competency for Knowledge-based Service Economy and the Service Scientist Competency Model will be incorporated to construct the ICT HR Competency Development Model for Thailand towards Knowledge-based Service Economy as shown below in Figure 3.

RESEARCH METHODOLOGY

With the ICT HR Competency Development Model above, this research was conducted by using an In-depth Interview survey with the 10 key subject matter experts/leaders in the academic, ICT services, industry and business, government and foreign investment sectors which then the required ICT competencies will be specified as these ICT competencies could help improve their organizations on the operation efficiency, time and cost reduction and customer satisfaction. The key subject matter experts who were interviewed in this research are the professors of ICT faculties from well-known universities, president and executive directors from ICT industry associations, executives from business companies, officials from Ministry of ICT and managers from foreign business associations. The knowledge on the required competen-

cies of ICT HR in Thailand will also help the policy maker and stakeholders be able to design strategy to drive the country towards the Knowledge-based Economy successfully.

In the survey, the questions were asked to interviewees and the answers were used to analyze on what ICT competencies will be required for the ICT HR development policy from interviewee's point of view in the sectors they belong to by having them assign the five-points Likert scale in the box they see that it should reflect on the recommended ICT competencies ranging from Extremely Important (5), Very Important (4), Important (3), Somewhat Important (2) and Not Important At All (1).

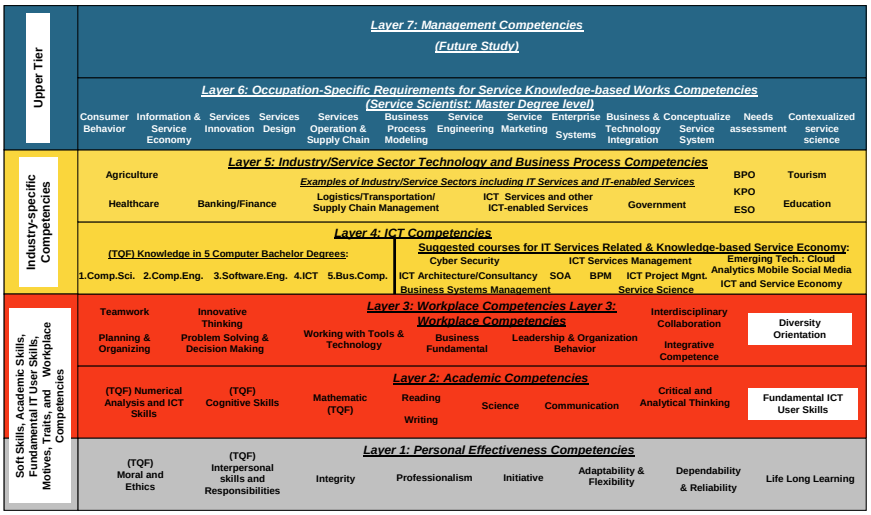

Figure 3. ICT HR Competency Development Model for Thailand Towards Knowledge-based Service Economy

AS noted, the illustrations are displayed in graphs of the required competencies by using the equations (1) below.

$$\text{Required.Competencies}_{\text{Layer j}} = \left\{ \sum_{j=1}^{m} \frac{\sum_{i=1}^{n} \frac{x_{ij}}{n}}{m} : 3 \leq Y \leq 5 \right\} \quad (3)$$

Where : $\text{Required.Competencies}_{\text{layer j}}$ = Set of Average Likert Scale Scores Y from Average Score x from experts on each competency in each layer

Y = Average Likert Scale Score Y where $3 \leq Y \leq 5$

x = Average Score x from experts of each competency of each layer

n = number of experts.

m = number of competencies in layer j

SURVEY RESULTS AND ANALYSIS

From the graphs in Figure 4, one could see that all competencies in Layer 1 – 6 receive the Likert Scale score more than 3, hence all the competencies from the proposed ICT HR Competency Development Model for Thailand towards Knowledge-based Service Economy are seen as the required competencies by the stakeholders in each sector. Particularly in Layer 1 which contains the soft skills including abilities/attitude competencies, Layer 4 which contains the core ICT academic knowledge from the National TQF program including the ICT knowledge and Layer 5 which contains industry and business technology and business process competencies outstandingly received high score between 4 – 5 in all sectors (Academic, ICT, Industry & Business, Government and Foreign Investor) which means that the soft skills such as Integrity, TQF Morals and Ethics, TQF Interpersonal Skills and Responsibilities, Dependability and Reliability, key core ICT knowledge and technology and business process in related industry and business sectors are considered as the important part of ICT Competencies to help push forward the Knowledge-based Service Economy for Thailand.

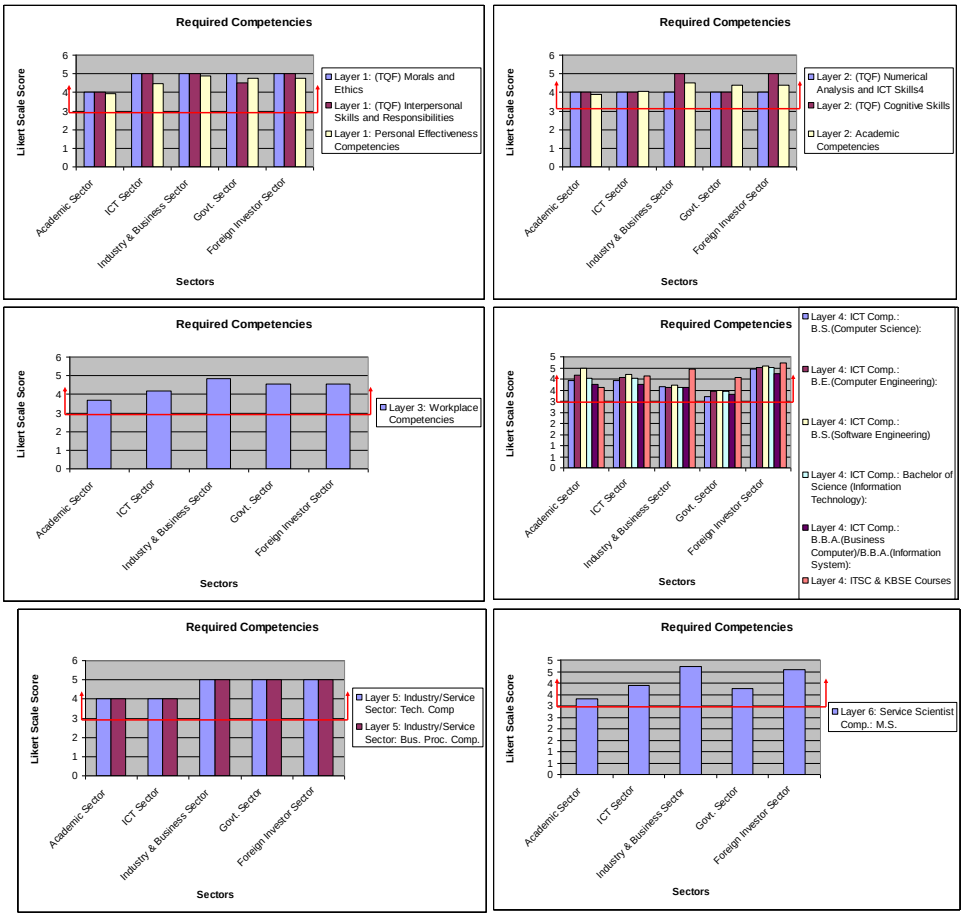

Figure 4. Graphs on Required Competencies for Each Sector

For each specific sector, the competencies which are important to each layer also are studied. From the graph in Fig. 4, the competencies which receive Likert score more than 4 – 5 are considered highly important to each layer. The Soft Skills competencies (Layer 1) are considered highly important to all sectors while the Academic competencies (Layer 2) are particularly highly important on Cognitive Skills and Academic Competencies for the Industry & Business and Foreign Investor sectors. The Workplace competencies (Layer 3) are particularly

high important for Industry & Business, Government, Foreign Investor accordingly) while ICT competencies from TQF program and the ICT for Knowledge-based Economy (Layer 4) are considered important to all sectors with particularly highly important to Foreign Investor, ICT and Academic sectors accordingly. Technology and Business Process competencies (Layer 5) are particularly considered highly important to Industry & Business, Government and Foreign Investor sectors whiles the Service Science competencies in Layer 6 are particularly considered highly important to Industry & Business, Foreign Investor and ICT industry accordingly.

CONCLUSION

From the study, the competencies listed in the ICT HR Competencies Development Model from Layer 1 – 6 are well accepted by the experts in the sectors with the suggest to the policy maker that each specific layer which receives score between 4 – 5 should be well considered as very important for the involved parties to see on how these specific ICT competencies should be improved. Particularly the requirements of ICT Competencies in each specific sector should also be considered highly important since these will help answer the needs of the sectors to use these ICT Competencies to better their operation efficiency, cost and time reduction and customer services satisfaction to their organizations. Future studies could be further studies on how to improve ICT competencies of ICT workforce and human resource required by specific key sectors in order to suit the requirements of each sector.

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