Conceptual Framework for the Development of a Professional Assessment System in Accordance with Professional Standards in the Business Computer Department

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Abstract: This research aims to synthesize the conceptual framework for the development of a professional assessment system in accordance with the professional standards in the Business Computer Department using cloud computing. This research and development on assessment systems has been conducted based on the specified professional standards. The synthesized conceptual framework comprises the system users' demands, theories and related literature. This framework was evaluated by ten business computer instructors, with more than 5 years' experience each, who are considered to be experts in this area. The result shows that the experts accepted this conceptual framework and agreed to use it in the assessment system.

Key words: Cloud computing, professional assessment.

1. Introduction

According to the ideology of vocational education and the vocational training management standards in B.E. 2561 (2018), the management of vocational education and training has to be in line with Thailand's National Education Development Plan and National Educational Plan, in order to produce and develop vocational manpower at operational, technical and technological levels. This will elevate vocational education to serve the demands of the labour market. By doing so, the personnel in this field will be knowledgeable with a combination of international theory and customary wisdom, and will then be able to work as operators or independent entrepreneurs [1].

The current competitive trade and fast-growing economy, including the participation of Thailand in the ASEAN Community since B.E. 2558 (2015), have influenced the development of vocational manpower's capability and quality. Graduates have to meet the educational and professional capability standards in their fields before entering the labour market. This mission has been assigned by the government to the Office of the Vocational Education Commission. The Ministry of Education identified the standards of vocational education for the levels of Vocational Certificate and High Vocational Certificate in B.E. 2559

(2016) [2], and the standards include regulations for desirable qualifications, and quality and standards in vocational education management. These regulations will be used to promote, supervise, inspect, evaluate and guarantee the quality of vocational education management. Then, the standards framework of each field will be conducted so that each school can create and develop the curriculum and course syllabus. Thus, curriculum management and its assessment will be based on these professional capability standards.

Graduates at the level of Vocational Certificate have to achieve the cumulative credit stated in the curriculum, with a Grade Point Average (GPA) of not less than 2.00 out of 4.00, and pass the professional capability assessment. This assessment is usually conducted in schools, which are required to report the result at the end of that semester. Each school, therefore, needs to collect a large amount of information, which includes the theoretical and professional capability of the students, and summarize the results in a limited time. Then, the results are evaluated to ascertain whether or not that student has passed the assessment. This result is also considered to be the key to the student's graduation assessment.

As mentioned previously, vocational curriculum management aims to produce and develop vocational manpower of high quality and with professional capability. The professional assessment, therefore, is conducted based on clear and standardized criteria, and regulations focusing on practical learning in real situations, through bilateral collaboration and/or other circumstances depending on collaboration with a company or related parties in every level.

From the introduction stated above, as the professional assessment results will be used as one of the evaluation tools to assess graduation for the Vocational Certificate, plus the fact that the government''s model "Thailand 4.0" is pushing the economy to become an innovation-driven economy, the entire assessment process has to become more convenient and faster through the use of online tools. One of these is cloud computing in the form of software or Software as a Service (SaaS). With cloud computing technology, the professional capability assessment will be more productive, accurate and precise within a shorter timeframe.

2. Literature Review

Competency is an important skill needed for a job. It can be evaluated by observing behaviours; the behaviours must be estimated by observers who assess them candidly, and spend sufficient time with subjects in order to monitor them closely. Normally, the examiner should be the subject's supervisor. Those undertaking the analysis must understand the definitions and levels of competency that they are investigating clearly. For the evaluation, the examiners should estimate whether the attendee's behaviours are compatible with particular levels of competency. They observe and record the behaviour of subjects at certain time intervals to build-up evidence in case the subjects oppose the results that they receive [3]. Therefore, these characterizations and abilities, including knowledge, skills and attitude, are used for work in organizations [4] and contribute to the success of organizations [5].

Cloud computing is a service in information and communication technology. Moreover, this system enables any technology resources to work jointly for the benefit of users [6]. The ability of cloud computing is the system by which users are able to determine the working capability of the system by themselves, and adjust resources, being able to detect and control how much to use.

Cloud computing is divided into three groups: 1) Infrastructure as a Service (IaaS) in the form of virtual devices, including virtual storage available to every file system, and virtual processors able to change the number of processes depending on use types; 2) Platform as a Service (PasS), which is a MIS Framework, and 3) Software as a Service (SaaS), which develops applied programs running on virtual machines by using specific instruments of firmware for managing the information and communication technology system [7].

Cloud computing services and development trends have encouraged several organizations to implement cloud computing in their own workplaces [8]. Educational institutions utilise functions where information systems are implemented as a tool to facilitate their operations. However, most of the systems currently used in these institutions are installed separately. Therefore, the resources of each function cannot be shared and utilised jointly. Moreover, some functions require a high performance computer, but they are not frequently used. Consequently, people question whether such systems are cost-effective and suitable for investment [9], [10]

As mentioned above, instructional models for vocational education are the models which aim to produce and develop manpower in terms of professions, in order that the students involved will be able to practice and obtain sufficient skills to pursue a career. The term 'vocational standard assessment' means to assess knowledge and capability, as well as work habits, according to vocational standards with appropriate tools which adopt clear assessment criteria, and to carry out the assessment under standard terms.

3. Objective

To synthesize and assess the appropriateness of the framework for the research on the development of a professional capability assessment model according to the vocational standards of the Business Computing Vocational Certificate Program with Cloud Computing.

4. Methodology

In order to conduct this research, the methodology was divided into six stages as follows:
1) Study theories, papers, research and articles regarding theories or models of vocational standard assessment as well as national and international research.
2) Draft the basic framework for the development of a professional capability assessment model according to the vocational standards of the Business Computing Vocational Certificate Program with Cloud Computing, based on related theories, papers, research and articles.
3) Identify a team of experts. The researcher identified related experts with the following qualifications: business computing teacher with more than five years of work experience. There were ten people in this purposive sampling.
4) Develop a framework-appropriateness assessment form to assess competency according to the vocational standards of the Business Computing Vocational Certificate Program with Cloud Computing.
5) Collect data using a questionnaire to collect the experts' opinions on the developed framework.
6) Adjust the framework according to the experts' suggestions and conclude the analysis.

5. Results

After conducting the research based on related theories, papers, research and articles, the framework was developed as shown in Fig. 1.

Fig. 1 shows the improved conceptual framework for developing a system for evaluating specific competency in the business computing area. According to the Office of Vocational Education Commission, the Cloud Computing Diploma depends on the following obligations:
1) The High Vocational Certification rules and methods of evaluating competency established in 2013.
2) The Ministry of Education announcement about the national conceptual frame in 2014.
3) The order of the Ministry of Education issued in 2013 about estimating the grades of the vocational certificate curriculum in 2013.

4) The Ministry of Education announcement issued in 2013 about the standard of vocation in vocational certification in 2013. This is composed of four sections considering the threshold for evaluating the standard of vocation in the business computer department depending on competency.

5) Developing a system for evaluating the competency of the standard of vocation in the computer business area according to the High Vocational Certification in Cloud Computing using 'Software as a Service' to manage the cloud computing environment.

6) Estimating the system developed in order to find the most appropriate system.
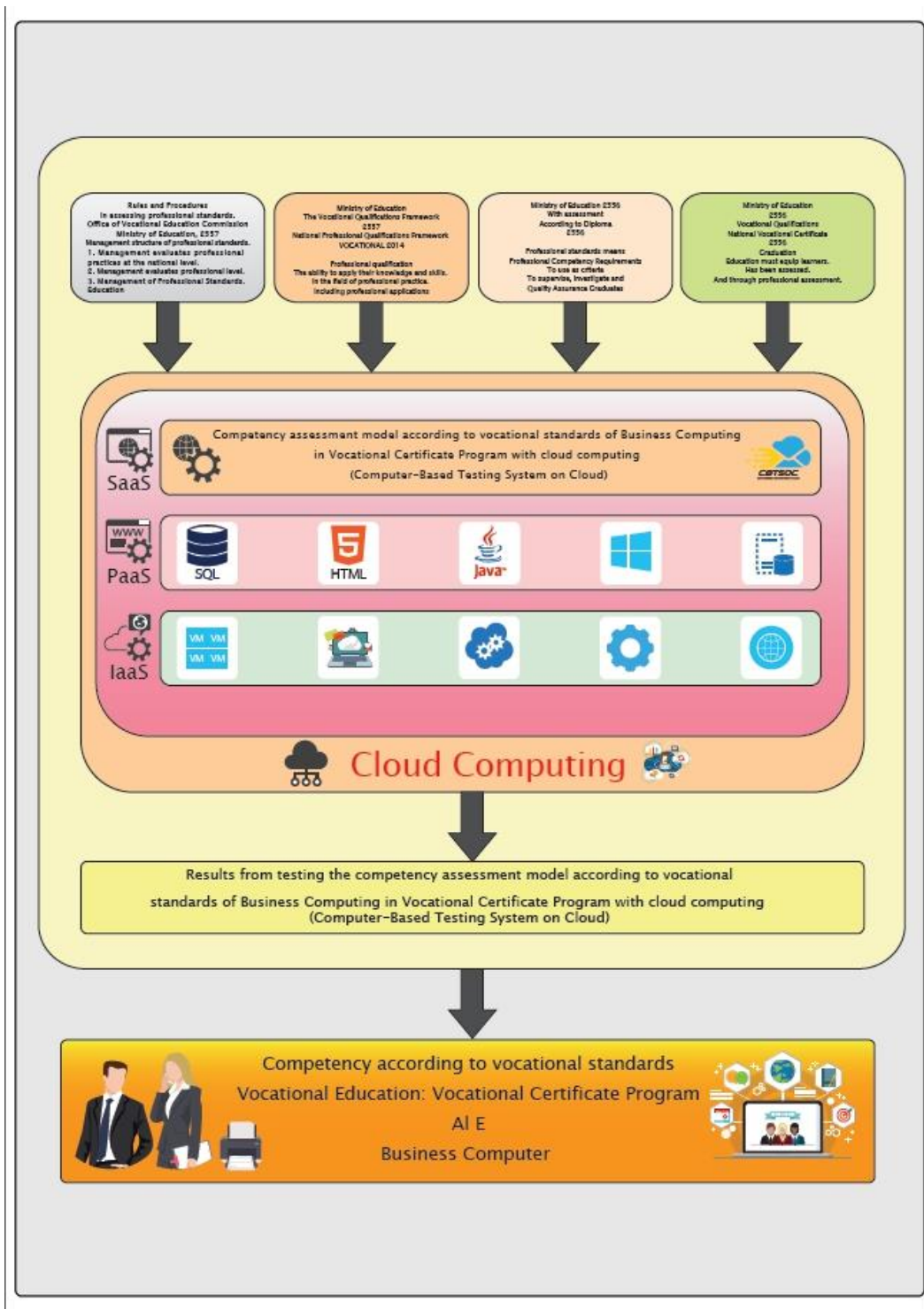

Fig. 1. The conceptual framework for developing this competency test system.

In Fig. 1, the framework developed contains the above concepts. In order to develop the competency assessment model according to the vocational standards of the Business Computing Vocational Certificate Program with Cloud Computing, the ten experts have given responses as outlined in Table 1.

Table 1. Framework Assessment Results Which Were Deemed Appropriate by the Experts

Assessment Criteria	$\bar{X}$	S.D	Data Interpretation
1. The assessment must be conducted according to the predefined criteria and assessment methodology for vocational standards.	4.80	0.42	highest
2. The assessment must be conducted according to the National Vocational Qualifications Framework.	4.50	0.53	highest
3. The assessment must be conducted according to the Qualifications Framework for Vocational Education (Vocational Certificate Program)	4.70	0.48	highest
4. Cloud Computing is applied and optimized.	4.90	0.32	highest
5. Appropriateness and practicality	4.60	0.52	highest
Average	4.70	0.46	highest

Assessment results

For the framework for the development of the professional capability assessment model according to the standards of the Business Computing Vocational Certificate Program with Cloud Computing, the results from the ten experts in Table 1 suggest that its appropriateness is at the highest level ($\bar{x}$=4.70, SD=0.46).

6. Conclusion

The development of a framework for a professional capability assessment model according to the standards of the Business Computing Vocational Certificate Program with Cloud Computing was conducted by analysing elements defined by the Office of the Vocational Education Commission, Ministry of Education. National qualifications for Vocational Education (Vocational Certificate Program) B.E. 2556 (2013) were assessed by ten experts to consider the appropriateness of the framework and the results were at the highest level ($\bar{x}$=4.70, SD=0.46). It is evident that the framework is appropriate for developing a professional capability assessment model according to the required standards.

Previously, before students were able to graduate from college they were required to pass a professional assessment of skills according to the Vocational Certificate 2013. This was a paper-based test in which students took an examination. Teachers evaluated pupils on their finished test. This showed whether students passing the test were suitable for graduation. The evaluation criteria in this assessment required points totalling 80% or above. Students achieving this level passed the exam. Furthermore, the number of students had an effect on the teachers, because in the limited time teachers had to control the situation and the students had to finish their tests on time. However, the new model is able to deal with the problems mentioned above. The researcher has developed a new assessment (the professional assessment system) that works on cloud computing using SaaS. The assessors will be able to evaluate the students' skills, conclude the assessment at that moment and students will know the result soon after they finish the test. This is convenient, fast and accurate. Thus, this system will satisfy its users.

7. Discussion

The conceptual framework for the development of a professional capability assessment model according to the vocational standards of the Business Computing Vocational Certificate Program with Cloud

Computing synthesized in this research was based on the criteria and regulations defined by the Thailand Professional Qualification Institute (TPQI). In addition, the assessment is in accordance with the vocational qualification standards for the level of Vocational Certificate as defined by the Office of the Vocational Education Commission. The assessment system was developed by applying cloud computing to the process. The experts agreed that the system is appropriate. The results are at the highest level ($\bar{x}$=4.70, SD=0.46). The lower average value is in accordance with the criteria and procedures of the professional assessment standards. The experts agreed that the result is appropriate and at the highest level ($\bar{x}$=4.80, SD=0.42). Therefore, it can be concluded that the framework developed can be further used in the development of the assessment system.

Acknowledgment

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