



Research Article

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The Competency Model of Graduated student in Air cargo Management Program of Thailand: Civil Aviation Training Center Thailand

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Abstract

This research aims to explore the competency model of students who graduated from the Air Cargo Management Program of Civil Aviation Training Center. The research methodology consists of studying the competency requirements of an aviation company and that of the students in the Air Cargo Management Program. The sampling group consists of administrators and staff of aviation companies, amounting to a total of 210 participants. The competency model of students who graduated from the Air Cargo Management Program was collected using the Quality Function Deployment (QFD) method. This produces a semantic model which was confirmed using the Focus group method. The areas focused are competencies in attribute, knowledge, and skills. The results show that the highest mean in the Attribute competency, where 4 topics consisting of 17 subtopics were researched, obtained a mean score of 4.15, and an important weight score of 2.79. The Second highest mean score was in the knowledge competency, where 7 topics consisting of 17 subtopics were researched, obtained a score of 3.72, and the highest important weight score of 2.59. And the third was the Skills competency; the mean 3.70, the highest important weight score of 2.59 and there are 6 topics consisting of 17 subtopics.

Keywords: *The competency in Air cargo management program*

1. Introduction

Air Transport is one key factor which drives the world economic movement. The world export industry relies on Air Transportation including the Air Freight. Air freight in Asia is the highest in the Air Transport industry and it is forecasted to grow even further, (Education news/air cargo,1992). It is an essential industry which drives the world economy. According to the International Air Transport Association (IATA), Air Freight accounts for 40 percent of world exports and has been expanding at an annual rate of 6.29 percent. Moreover, Boeing Company Ltd. forecasted a long-term growth in the Air Freight at a growth rate of 6.4 percent annually. The growth rate is the

highest in Asia in comparison to other regions of the world and will grow at a faster rate. The growth rate is at 8.6% per year and is projected to continue in 2019. Asia has a market share of 50 % of the global Air Freight (Education news/air cargo, 2016) and IATA has predicted a rapid growth in the Africa and Asia region to be at about 4 %, where the highest would be in Vietnam, at a rate of 6.6%, (Harris,2013). The establishment of a joint committee to establish the importance of E-Cargo and reduce the risk of liability, legal challenges, and airlines. The organization has been working with FIATA (International Federation of Freight Forwarders Associations) including the developed of IATA worked with FIATA, the global body representing national associations of Freight Forwarders, to create a program that recognizes the modern business relationship that exists between airlines, their Freight Forwarder, and customers. The program, which is conducted jointly by the Freight Forwarders and the Airlines, will establish professional standards, promote the enhanced use of technology and the continued use of the Cargo Accounts Settlement System (CASS). Country-based test launches of the program will begin before the end of 2015 (International Air Transport Association, 2015). A development program for the Air Transport, IATA and FIATA managed together. In 2015, there were other key industry programs consisting of shippers, Freight Forwarders and the entire air cargo value chain. However, the industry focused on the following; replacing paper and analog processes with digital data transfer through the implementation of E-Freight. These processes would ensure a secure supply chain to minimize security-related delays, including the development of a global facilities matrix and the validation certification program for air cargo infrastructure as well as raising the standards of cold chain shipments. The E-Freight program will modernize air cargo processes with digitalized standard documents adapted for electronic commerce. This will promote efficiency and enhanced security, eliminate the need for multiple data entry, reduce errors and enable advanced data transmission to the authorities. The air cargo industry has focused on replacing the paper Air Waybill with an electronic Air Waybill (International Air Transport Association, 2015). Overall, the growth of the global economy and the expansion of the transportation sector have resulted in an increase in requirement for personnel at both domestic and international airport warehouses and even more in support sectors. While Air Cargo Management Program of various institutions, such as the Civil Aviation Training Center, carry out specialized training to focus on aviation personnel to be experts in aviation business in accordance to the standard of the Department of Civil Aviation, International Civil Aviation Organization(ICAO), and the criteria for Bachelor's Degree Program BE 2542 (Civil Aviation Training Center, 2012), the graduated students also have to meet the requirements of the aviation industry such as skills, knowledge and ability to work. Currently, the main curriculum standards for air cargo have not been developed to the same standards. This includes institutions or universities that can conduct such courses. It is not possible to produce talented graduates who have the ability to respond effectively to the air cargo industry.

1.1 Objectives

The objectives of this article are to study the requirement of aviation establishments with respect to the competency of the graduated student in air cargo management program and to develop the competency model of the graduated student in air cargo management program.

1.2 Literature review

In addition, research topic of the competency model of the graduated student in Air cargo management program of Civil Aviation Training Center has the conceptual in the competency model that meet the requirement of the Air Cargo industries effectively. The definition of competency model is the group model of organizational competency and consist of the groups of a category (McClelland, D.C.A, 1975). This can be broken down into two different categories. Threshold competencies and differentiating competencies. Threshold competencies refer to the knowledge or basic skills that the people need for their work. Differentiating competencies refer to the factors affecting job efficiency, higher than the standard or other people. Spencer and Spencer (1993) mention that the competency in this group will focus on knowledge, skills and other

attributes such as Values, Motives, and Attitudes which increase their high achievement. Competency model is described as competency grouping where each group has many sub-contents of competency in each the competencies. There are behavioral indicators that the details were defined. (Hughes, Ginnett, & Curphy, 2008) define competency model as a group of skills, Knowledge groups, and other groups that can make a successful job. This includes the websites of competency models that provide the definition of competency models that is a framework of skills and knowledge. It's necessary for performance or gathering or talent group that leads to successful work. In defining business plans or evaluating the competencies of the person in an organization, competency was described as a descriptive competency needed to succeed or any kind of competency that perform the job accomplishment, together with the meaning of competency model to combine into one of specific task success (Dubois and Other, 2004). In the competency model was a capital of human resources which is essential for each function. The requirement or recruitment process was important to find the qualified person to suit with the job. Including, the organization should develop or training them to have those competencies.

Quality Function Deployment (QFD) is a tool to find the products that the customers' requirement and the product were met the specification requirement. QFD process starts with finding what the customer needs from the product. Then, making the relationship between product design and what the customer needs will be put together in the table matrix. It was started as a process engineering design for possible consistency before getting started on the production process (Crow, 2016). Moreover, the finding is in response to customer satisfaction. QFD is suitable if the requirements and comfort levels of customers is defined (Revelle, 2004). The application of QFD techniques is useful for finding the competency requirements of the aviation companies' effect with the graduated student in air cargo management program. The researcher has applied some technique to QFD process that is consistent with the task to find the competency that meets the requirement of aviation companies effectively. There are six steps in the QFD adaptation process: First step, determining the requirement of aviation companies for the performance of the graduated student in air cargo management program of Civil Aviation Training Center. This is a left-hand wall of the house of quality (House of Quality). Second step, to determine the priority of aviation companies for the performance of the graduated student in air cargo management program of Civil Aviation Training Center. This is the right-hand side of the house of quality. The third step, detailed description of the requirement of aviation companies for the competency of graduated student in Air Cargo Management program of Civil Aviation Training Center. This step is to create the ceiling of the House of Quality and the fourth step, the relationship between the requirement of aviation companies to the competency of graduated student in Air Cargo Management Program and the details of the requirements. This step allows us to build the house and the house style of quality (House of Quality). The fifth step, is to show the relationship of the details of aviation companies to the competency of graduated student in Air Cargo Management Program. This step builds the roof of the House of Quality and the last step, to exhibit the priority of details of aviation companies to the competency of graduated student in Air Cargo Management Program, this step to create a home of the House of Quality

The Focus group is typical of an interview that used by the interviewer or the interviewee in the small groups. It is often done to collect the data. This group discussion will get more in-depth on each problem issue. In addition, interviewees will be able to provide data relevant to the subject matter of the study. The number of people participating in-group discussions was about 8 to 12 people. The primary purpose is to know the facts between the groups on a specific subject, including experiences, tastes, beliefs, knowledge, and interaction between the research respondents by using a stimulating approach and brainstorming from moderator within a specified time (Bunnag, 2010). This research requires people who are experienced in the field of the Air Freight as they have shared a variety of opinions and to obtain the essential data in the competency of aviation companies. In addition, the data from the research is analyzed, data collected and synthesized in the research method correctly. From the data on the competency model mentioned above, the researcher concluded the research framework in the competency model, which is a semantic model, by using language as the medium to describe the competency of a person to visualize the structure of the description of the components of the subgroup

competency in each group. The behavioral characteristics were measured in each of the competencies achieved by the personnel in each group that is from research methods.

2. Materials and Methods

Research was conducted by the researcher who studied the concepts and principle. The results of the research stage are as follow.

2.1 Study the competency requirements of aviation companies' effect to the graduated student in air cargo management program of the Civil Aviation Training Center. By using the questionnaire; which is a checklist of 5 level rating scales. The questionnaires were used to determine the competency requirements of the graduated student in the air cargo management program. There were 210 participants. Sample size criteria of Krejcie Robert and Morgan, Daryle (1970) was used. The Rule of Three in arithmetic for calculating the sampling groups are described below;

2.1.1 Population and Samples

Population: 1,250 people. This includes the administration of 150 Air cargo Establishment that the graduated student in Air Cargo Management Program were working with. The air cargo establishments are an establishment of a limited company, limited partnership and the airline. There were a total 150 people in positions such as President, Director and Manager. There are a total of 250 Deputy Directors, Vice Presidents and Deputy Manager. There are a total of 350 Head of Department and Group Leaders. The total number of employees who have experience of 3 years or more is 500.

Sample: 210 people. There are 25 people as Director, President and Manager. There are 42 people as the Deputy Director, Vice President and Deputy Manager. The Head of Department and Group Leader consists of 59 people. Employees with 3 years or more of experience consists of 84 people. The sample size has used the criteria of Krejcie- Morgan table to determine the size of the Samples and the stratified random sampling method was classified by level of job and usage rule of three in arithmetic for calculating a number of sampling groups (Lenin, 2015).

2.1.2 Research Tools

The research tool was the questionnaires and it was split into 2 parts: **Part 1:** 3 general information of the respondents. **Part 2:** 67 questions pertaining to the competency required by the Air Cargo Establishment. The questionnaires have a reliability at 97.6%. The first area questioned is Knowledge and it consisted of 45 items. The second are the Skills, which consists of 17 items. The third area is Attribute, which consists of 5 items.

The Item-Objective Congruence (IOC): The research tools used a questionnaire with the Item-Objective Congruence, which was used to find the content validity, the research question was checked by 5 experts in their related fields, and the score range of IOC from -1 to +1, the meaning as shown:

- 1 = Inconjunct
- 0 = Questionable
- +1 = Conjunct

The score of the items lower than 0.5 was revised or eliminated. If the score is higher than or equal to 0.5, the items were retained. The research has the Item-Objective Congruence (IOC) between 0.6 – 1.00.

Reliability: The try-out process with 30 people who are not related to the sampling groups. The reliability of the questionnaire was determined through the instrument that the content was reliable and consistent. The reliability value could be calculated by Cronbach's alpha, Eunha Kim and Hyunsil Yoo (2011) to ensure the contents are consistency and this questionnaire has reliability on the score 0.976

2.1.3 Data Collected and Analysis

The data collected from the questionnaire underwent content analysis and analyze the competency of the graduated student in Air Cargo Management Program in three aspects. Those are knowledge, Skills and Attribute. By using descriptive statistics; the mean (\bar{X}) and standard deviation (S.D.), the analysis was performed by applying QFD technique to prioritize the competency requirement of the graduated student in air cargo management program. By using, the mean (\bar{X}) to find the competency with an equation of QFD techniques that was applied to see the relationship with the QFD in the matrix table, which the researcher applied to find content related items in each group. This is an advantage of QFD; evaluating the scores so that it can be linked to the relationship of the content by starting with the analysis of important score (IMPs) which was derived from the mean (\bar{X}) of each data to compare with QFD. The researcher then analyzed the weight of important score (IMP weight) with the equation of the important score; equal to sum of the mean of the content of each group divided by the sum of mean of the content within each group ($IMP = \frac{\sum(\bar{X}) \text{ of IMP weight}}{\sum(\bar{X}) \text{ content of each group}}$). This is a part of QFD adaptation. The data of this result is the relationship between the matrix tables with the content in each group. They consist of Knowledge group, Skills group and Attribute group.

2.2 Create a competency model of the graduated student in Air Cargo Management Program of Civil Aviation Training Center. The researcher defined the research stage with more detail in each process as follows.

2.2.1 Draft competency model of the graduated student in Air Cargo Management Program of Civil Aviation Training Center. The researcher-analyzed data in both of the competencies and the requirement of the aviation company that effect to the competency of the graduated student in Air Cargo Management Program from the content analysis and application of QFD technique. The result was a draft of competency model of the graduated student in Air Cargo Management Program of Civil Aviation Training Center.

2.2.2 To confirm the competency model of the graduated student in air cargo management program of Civil Aviation Training Center. The researcher conducted it by focus group technique and corrected to complete the competency model.

3. Result

The results of the study are shown below. The researcher showed the results of the requirement analysis in the Knowledge, Skills and Attribute with the mean (\bar{X}), standard deviation (S.D.), requirement level, and priority in the overview of three aspects in table 1. Referring to table 1, it is found that the sample participant has the requirement for the competency of the graduated student in Air cargo management program which was in the highest level of $\bar{X} = 3.83$. When considering each aspect of the sample, it has requirements from a high level to low level of each aspect as the Attribute of $\bar{X} = 4.12$, knowledge of $\bar{X} = 3.69$ and skills of $\bar{X} = 3.69$

Table 1: Represented the mean (\bar{X}), standard deviation)S.D.(, level and priority of requirement of an aviation company

Items	Sum of participants sampling (n=210)			
	\bar{X}	S.D	priority	Average \bar{X}
Knowledge (k)	3.69	0.94	2	3.72
Skills (S)	3.69	0.94	3	3.70
Attribute (A)	4.12	0.81	1	4.15
	3.83	0.90		3.86

The competency model of the graduated student in Air cargo management program of Civil Aviation

Training Center was deduced by applying QFD to find the relation of the important weight score (IMP) in table matrix. They represented the relationship between the competency requirement of the graduated student in each aspect and the requirement of Aviation Company. The researcher presented the data result from analysis within each group of competencies that was a model of knowledge, Skills, and Attribute. They have the number of the requirement in each group of each various model component that different in the number of the topic result from the analysis which contained in table 2.

Table 2: The result of data analysis and a number of competency requirement in each aspect of applying QFD

Customer requirement	Knowledge	Skills	Attribute
Number of items requirement	21	6	6
Higher weight important score	2.59	2.59	2.79
Average \bar{x}	3.72	2.70	4.15
Correlate	2	3	1

Referring to Table 2, the first competency was Attribute competency and they have the highest important weight score around 2.79, mean 4.15, and they consist of 6 topics. The second competency is Knowledge competency, they have the highest important weight score around 2.59, mean 3.72 and they consist of 21 topics. And the third competency is Skills competency; they have the highest important weight score around 2.59, mean 3.70 and they consist of 6 topics.

It was confirmed that the competency model of the graduated student in Air cargo management program of Civil Aviation Training Center is by focus group technique. This confirmation resulted in the competency model of the graduated student in Air cargo management program of Civil Aviation Training Center were found it has the different contents in each competency group and the researcher has adopted the data as compliant with the suggestion of the expert. One suggestion given was the detail of the content behavior. It consists of knowledge competency that contains 7 topics and 45 contents. The Skills competency consist of 6 topics and 19 contents, and the Attribute competency consists of 4 topics and 17 contents, as shown in table 3.

Table 3: Represented the competency requirement and details of content behavior.

1. Knowledge competency.

Knowledge in:	Details:
1) Air cargo process	1.1) The inspection procedures, product characteristics, types of goods, packaging and knowledge and understanding of: 1.2) Symbols and acronyms in Air Cargo 1.3) Cargo transportation and technical terms of air cargo. 1.4) Warehouse standards and Warehouse management 1.5) The provision in warehouse operations. 1.6) The air cargo process. 1.7) The air cargo transportation and exchange. 1.8) Compensation and damage insurance. 1.9)The symbol of the cargo area on the airplane. 1.10) Cargo space and size of the cargo, freight unit, volume units, weight reading, and volume reading. 1.11) Transshipment system from aircraft to aircraft.
2) Customs clearance and cargo pick up	2.1) Export-import cargo. 2.2) Import-export cargo in the logistics systems. 2.3) Freight by an agent. 2.4) Air cargo release and inspection. 2.5) Freight rates and cargo weight. 2.6) Freight by an agent. 2.7) The documentation for air cargo.
3) Aircraft equipment and fixtures	3.1) The technical terms of cargo and freight area. 3.2) Technical airframe terminology and type of airplane. 3.3) Structure freight of loading on the aircraft 3.4) Unit space in each aircraft type. 3.5) The limitations of space area, cargo loading product 3.6) The limitations of various fittings types which used in the cargo.

4) The revenue share agreement	4.1) The control process of financial 4.2) The interchange of freight and commissions of the transferee. 4.3) Thai Airfreight Association (TAFA) requirements for revenue collection. 4.4) The term of each airline in air cargo. 4.5) Payment terms between Air cargo carriers.
5) Introduction to Air cargo.	5.1) The structure of air cargo. 5.2) The role of the air transport industry. 5.3) The provision of air transportation business. 5.4) The planning, controlling, the business operation of air transport. 5.5) The patterns and opportunities for optimizing air transport.
6) Air cargo technology	6.1) Basic computer programming. 6.2) Computer programming for freight 6.3) The usage of information systems in the management of air freight. 6.4) The usage of technology for developing and reducing warehouse management procedures.
7) Laws and regulations on aviation	7.1) Documents related to aircraft and airworthiness. 7.2) The provision of the Thai Air Transport Association (TAFA) 7.3) The international transport laws and the specific transport regulations of each country. 7.4) The provision of each airline. 7.5) The principle of safety and security. 7.6) Packing provision, Controlling, the badge Closing, dangerous goods sealing 7.7) Know and understand the load provision, transferring, storage of dangerous goods

2 Skills competencies

Requirement	Detail of content behavior
1. Management skills	
1.1) Revenue sharing agreement	1.1.1) Have negotiation skills to share the benefits of air freight. 1.1.2) Have the ability to use multi-party agreements to agree on revenue sharing.
1.2) Air freight marketing	1.2.1) Have analytical skills and assess the investment in air freight. 1.2.2) Have the reporting skills and analyze the air freight marketing.
2. Technical skills	
2.1) Air cargo technology	2.1.1) Computer program presentation skills. 2.1.2) Have computer usage skills. 2.1.3) Have good communication skills. 2.1.4) Skillful presentation of air freight with a computer program. 2.1.5) Skillful in using computer software, especially for air cargo.
2.2) Aviation Technical English for air cargo	2.2.1) Have interactive English conversation skills. 2.2.2) Have interactive skills in English conversation for air cargo 2.2.3) Good command of English and technical terms for reading, academic writing in air freight
2.3) Air cargo	2.3.1) Have the space calculation skills. 2.3.2) Have the skills of air cargo operations 2.3.3) Have the skills to calculate the price per area and product weight. 2.3.4) Have skills to make documentation control the Product Type 2.3.5) Have status report writing skills.
2.4) Communication skills	2.4.1) Have skills to communicate with people inside and outside the organization. 2.4.2) Have skills to communicate in air cargo between the inside and outside the organization.

3 Attribute competencies have represented in the table below;

Requirement	Detail of content behavior
1) moral, ethics	1.1) Responsible for both themselves and others. 1.2) Be punctual. 1.3) Have a professional consciousness. 1.4) public minds.
2) Interpersonal skills	2.1) Have human relations. 2.2) To socialize and share with others in society. 2.3) Can work with others creatively.
3) Personality behavior	3.1) Enthusiastic, to learn new things 3.2) Have a willingness and pay attention to the job 3.3) Work within a given time frame 3.4) Have thorough and carefully 3.5) With intelligence to reason, and creative
4) Leader ship	4.1) Have an accepted changed 4.2) Have a good attitude, can adapt to change. 4.3) Have respect and faith in yourself, punctual and responsible. 4.4) Respect for human rights and human dignity. 4.5) Have respect for the organization, the goal of life and work. 4.6) The principle of living: Good personality is a role model for others.

4. Discussion

With reference to the competency model of the graduated student in Air Cargo Management Program from the data analysis and synthesis, research process, as well as the QFD application and focus group technique, the competency model of graduated student in Air Cargo Management Program from Civil Aviation Training Center, covers the most important competencies. They attribute competency, knowledge competency and finally skills competency. These complied with the research of Thai Airfreight Forwarders Association, which points out that freighters must be the leader of developing competencies such as Interpersonal and Relationships, punctuality, Social responsibility, knowledge about shipping, Rules and Regulations, Customs Act, Investment Promotion Act, Logistics Technology, Customs knowledge, Internet Business Skills, and knowledge of air cargo management. Woong Eun and Yongseok Seo (2015) study of freight in Dubai shows that operators should have attributes such as effective communication, having a public mind, creative culture in transport development, knowledge of warehouse management, air cargo software, document load, air transport, unit load devices, and air cargo marketing. In addition, it should also include the findings of interpersonal competencies in the workplace such as receptive communication, open communication, creative leadership, having a proactive relationship, communicate cautiously, listen to the opinions of others, expressive communication and communicate clearly to the point^[16]. Knowledge competency is about consistency with the research of Air transport. It was found that the personnel involved in the development of Air transport must be knowledgeable about air transport process. Staff involved in servicing air transport must have knowledge of Information Technology (IT), air transportation, airport charges & International Freight Representation("The global voice of freight logistics", 2015).

As a sentence above, research results were a competency model that is a semantic model and including the behavioral characteristics measured in each of the competencies achieved by the personnel. The competency model has the information required to improve the Air Cargo Management Program of Civil Aviation Training Center of Thailand set guidelines for Air Cargo Companies to train or improve the competency of their in compliance with the Air cargo company requirements and the research process.

5. Conclusion

From the analysis of information above, competency requirements of aviation companies lie in three areas. They are Knowledge, Skills and Attributes. According to the Thai Airfreight Forwarders Association (2012) mention that the freight forwarders must have knowledge on Freight Regulations, Rules and Customs Act, logistics technology, customs clearance. The skill competencies mentioned were online business skills and good leadership skills. As for attribute, it was in the areas of personnel relationship and organization, punctuality, social responsibility. On top of that, administrators also must be good in human relations, discipline, and proper academic skills. The Thai Qualification Framework for Higher Education formulated in D.C.2011, (The Office of The Higher Education Commission [OHEC], 1999) to determine the outcomes of the learning skills into seven areas: moral – ethic skills, learning skills, intellectual skills, interpersonal skills, numerical literacy, communication and information technology skills. Employees with moral-etic, responsibility, patience and human relation were highly valued (Orapin Santiteerakune & corps, 2007). When comparing between the three competencies areas, Aviation companies valued attribute competency the most. This is especially so in areas of human relation, moral, and ethic. The outcome of this research discovered that these competencies are vital and that to the education management of the education institute should instill such competencies mentioned in this article within their students. This will have a direct influence to the undergraduate student as graduates with the above-mentioned skills, knowledge and attributes perform well in work and are highly valued by aviation companies.

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