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Supply Chain Management Information System Model for Quality Assurance in Educational Management for ASEAN University Network Quality Assurance (AUN-QA)

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Abstract

The research aims to design and to assess the suitability supply chain management information system model for quality assurance in educational management for ASEAN University Network Quality Assurance (AUN-QA). The samples are 15 experts selected by purposive sampling. The data is analyzed by means and standardized deviations statistically. The research result shows that supply chain management information system model for quality assurance in educational management for AUN-QA is consisted of 5 keys which are main components, suppliers, manufacturer, customer, consumers. The data is analyzed by using arithmetic mean and standard deviation. The assessment of supply chain management information system model for quality assurance in educational management for AUN-QA. The results showed that the model was validated at a "high" level, suggesting that supply chain management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management information system model for quality assurance in educational management for AUN-QA aims to support sustainable information system development.

Keywords: Supply chain management, Information system model, Quality assurance in educational management, AUN-QA.

1 | Introduction



International Journal of Research in Industrial Engineering. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons .org/licenses/by/4.0). promote their social survival. Therefore, a consideration of education quality should be based on educational goals, e.g., qualifications of graduates, which should include knowledge, skills and other characteristics as prescribed by the curricula. Since testifying these qualifications requires time, and good effective sustainable administrative management, it is important to assure guardians, stakeholders and other involved parties that students who are graduated from a particular institution will be decent, competent and happy in society and take part in social development that progresses in line with the pace of globalization. To answer all the questions of education quality, it should be set up as principles or elements which a comparison can be made to inform development, supervision, examination and assessment of quality. Therefore, the standards of higher education, and student education as announced herein, are the requirements of education quality for all higher education institutions and student educations to utilize as goals or a directional framework to develop

Education system is the process whereby individuals acquire knowledge and other qualifications that

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sustainable quality of the institutions, and to use in self-assessment every year, or for a specified period of time, in order to learn whether educational administration has achieved its goals. These standards are also important for educational service areas or host units to employ as goals in supervision, examination and assessment of quality as a whole to inform quality improvement planning [1] and [8]. The awareness of the supply chain management information system model for quality assurance can be practical as a method to accomplish work procedures, actions and affairs within the organization. It starts from planning, providing accurate information at the time of need, practicing and maintenance, distribution or destruction by giving priority to information exchange, data analysis and sharing in order to achieve productivity through the development. The nature of supply chain and information technology will be derived to play a role in changing work processes to be more computerized in order to style occupied custom of technology not only carrying supply chain and information technology to work but also be able to determine the organization inevitably. Supply chain and information technology is increasing work proficiency, diminish work period, and costs are the heart of the progression organization about supply chain and information technology. Useful strategy and evidence technology are attaching with the work experience of staffs complicated in the supervision of quality assurance work with an incorporated work process to increase work competence and generate additional value for the association to continue the quality and standard of education in higher education. It is very important at the progress level. The ASEAN Quality Assurance Network (AUN-QA) is an ASEAN university network that is a collaboration of higher education institutes between member countries consisting of the National Association of East Asia, South Chiang Mai or ASEAN with the aim of establishing to promote educational cooperation which is an essential mechanism for creating a foundation for society and regional unity. The model for quality assurance can be practical as a method or tactic for dealing with quality assurance to accomplish work procedures, actions and affairs within the organization. It starts from planning, providing accurate information at the time of need, thus the researchers had an idea to develop supply chain management information system model for quality assurance in education management for AUN-QA.

2 | Literature Review

2.1 | Information and Supply Chain According to Asean University Network Quality Assurnace at Programme Level

Chansamut [4] said that the article, relationship between information and supply chain according to asean university network quality assurnace at programme level AUN-QA at programme level) importance

for applying in actual work settings. Based on findings from literature review, the researcher found a large number of papers and articles in supply chain. The relationship between information and supply is a key process to support the education whole activities system from upstream suppliers to downstream consumers. It enables the organization to promptly check the supply chain and information technology to ensure that the organization operates smoothly and effectively based on the determined strategies. The processconsisted of suppliers, manufacturer customers, including 11 activities in the supply chain namely, 1) Expected Learning Outcomes, 2(Programme Specification, 3(Programme Structure and Content, 4(Teaching and Learning Strategy, 5(Student Assessment, 6(Academic Staff Quality, 7(Support Staff Quality, 8(Student Quality and Support, 9) Facilities and Infrastructure, 10(Quality Enhancement, and 11(Output. All activities are connected with information communication technology in the educational institute according to asana university network quality assurance at programme level (AUN-QA at programme Level) start from the creation of information, news and resources to apply together to move the goods from the supplier to the customer, resulting in a rapid flow of information and effectively. This truly added the educational institute value as the production satisfactory for the consumers.





2.2 | Quality Assurance

Quality assurance is the process of determining the quality standards of education and the assessment process to meet the educational quality standards [10]. Internal quality assurance refers to guidelines for assessing the quality of education within the university mission, as graduate production including academic research, academic services, preservation of arts that educational quality assurance can be used to describe all activities and mechanisms which related to quality, both at the system level and the level of teaching in higher education institutions

2.3 | Quality Assurance of ASEAN University Network (AUN-QA)

AUN-QA criteria define a curriculum development based on AUN-QA criteria indicating that the department must follow teaching strategies and evaluation of quality indicators. To improve the program, it should have a course map showing the balance proportion of content, skills and courses along with expert that expected to learning outcomes and to use teaching approaches interrelated to innumerable assessment methods [14]. AUN-QA criteria are the presence of a university that is a property of a vast country, and it has a strategic plan in efforts to improve the quality and competitiveness of the country. Consequently, it is necessary to attempt the strength and increase the role as well as a role in the future.

Supply Chain and Information system is one of the goals that all education institutions strive to achieve. Supply Chain and Information will help education institutions improve efficiency and produce high-caliber graduates who have all the required characteristics.

3 | Conceptual Framework

This research's framework consists analysis and synthesis of documents supply chain management information system model for quality assurance in educational management for asean AUN- QA and the assessment the suitability of the model, as detailed in *Fig 1*.



Fig. 1. Conceptual framework about Supply chain management information system model for quality assurance in educational management for AUN-QA.

3.1 | Research Hypothesis

Supply chain management information system model for quality assurance in educational management for AUN-QA is evaluated to be appropriate at the high level.

3.2 | Research Instruments

A questionnaire to assess the expert's opinions toward the supply chain management information system model for quality assurance in educational management for AUN-QA is evaluated to be appropriate at the high level.

3.3 | Research Scope

Population: The population of this study consisted of 5 experts on supply chain management, 5 experts on quality assurance in education and 5 experts on information technology system.

Samples: These experts were chosen by the method of purposive sampling of individuals who have more than four years of work experience.

Variable of research: The independent variable is supply chain management information system model for quality assurance in educational management for AUN- QA.

The dependent variable is the evaluation result of supply chain management information system model for quality assurance in educational management for AUN- QA.

4 | Research Methodology

Supply chain management information system model for quality assurance in educational management for AUN-QA is the following:

- Study and analyse the relevant documents and research on model of the supply chain management information system model for quality assurance in educational management for AUN-QA.
- Use the obtained data to establish the conceptual frameworks for supply chain management information system model for quality assurance in educational management for AUN-QA.
- Present the model of supply chain management information system model for quality assurance in educational management for AUN-QA to the advisor for revision and amendment.
- Create questionnaire for evaluating the suitability of the model of supply chain management information system model for quality assurance in educational management for AUN-QA namely main components, suppliers, manufacturer, customer, consumers.

The developed questionnaire was a 5-scale rating questionnaire, with interpreted meanings as follows:

- The rating of 5 means most appropriate.
- The rating of 4 means highly appropriate.
- The rating of 3 means moderately appropriate.
- *The rating of 2 means lowly appropriate.*
- The rating of 1 means least appropriate.

Data collection and analysis. The developed questionnaire was sent to the experts in order to ask their opinions on appropriateness of developed model. Responses from the experts were analyzed to find the mean and standard deviation of each component. Criteria for interpretation of the means are as follows: [2], [3], [4], [5] and [6].

- The rating means ranging from 4.51 5.00 means appropriate at the highest level.
- The rating means ranging from 3.51 4.50 means appropriate at the high level.
- The rating means ranging from 2.51 3.50 means appropriate at the moderate level.
- The rating means ranging from 1.51 2.50 means appropriate at the low level.
- The rating means ranging from 0.00 1.50 means appropriate at the lowest

Final improvement of the developed model on advice from the experts.





5 | Research Results

Results of the research are presented in Fig. 1.

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Suppliers

University (Manufacturer)

Customers Consumers Implementation and Evaluation Delivery Larg Schools input - Colleges Program Structure and Content Teaching and Learning Approach Graduated Students Expected Learning Outcomes Student Quality and Support Facilities and Infrastructure - Families Academic Staff Quality Quality Enhancement Entrepreneurs Program Specification Support Staff Quality Student Assessment - State and Private Output Organizations AUN-QQA6 AUN-QA1 AUN-QA2 AUN-QA3 AUN-QA4 AUN-QA5 AUN-QA7 AUN-QA8 AUN-QA9 AUN-QA10 AUN-QA11

Fig. 2. Supply chain management information system model for quality assurance in educational management for AUN-QA.

Table 1. Suppliers, with its stakeholders, activities, and needs for information.

Suppliers	Activities	Needs for Information
Stakeholders: 1. School 2. College 3. Family 4. State and Private Organizations	 Sending graduated high school students. Sending self-supported students. Giving funding support for study. Giving educational scholarships. 	To reduce time in the admission process, with quick responses.

5.1 | The Principle of the Supply Chain Management Information System Model

Suppliers: Suppliers of the student (High school/college), Supplies of the family (Parents, Siblings), relatives, etc. and Government and private organizations (Scholarship). The suppliers mean the organizations that supply raw materials to the manufacturer. Raw materials in this case are students who graduated from high schools or two-year colleges, or students who receive special quotas for admission. They can apply for admission via the computer system that can process and store the data systematically.

Table 2. University (manufacturer) with its steps of quality assurance in educational implementation and evaluation, activities, and needs for information.



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University (Manufacturer)	Activities	Needs for Information	
Steps of quality assurance in educational Implementation and evaluation: 1. Expected Learning Outcomes (AUN-QA 1)	 The expected learning outcomes have been clearly formulated and aligned with the vision and mission of the university. The expected learning outcomes cover both subject specific and generic (i.e. transferable) learning outcome. The expected learning outcomes clearly reflect the requirements of the stakeholders. 	- To be filed and stored systematically to prevent the loss of information.	312
2. Programme Specification (AUN-QA 2)	 The information in the programme specification is comprehensive and up-to-date. The information in the course specification is comprehensive and up-to-date. The programme and course specifications are communicated and made available to the stakeholders. 	- To eliminate overlapping and duplicating work performances.	0(4) (2021) 307-317
3. Programme Structure and Content (AUN-QA 3)	 The curriculum is designed based on constructive alignment with the expected learning outcome. The contribution made by each course to achieve the expected learning outcomes is clear. The curriculum is logically structured, sequenced, integrated and up-to- date. 	- Accurate evaluation information.	mut Int.I.Res.Ind.Eng.1
4. Teaching and Learning Approach (AUN-QA 4)	 The educational philosophy is well articulated and communicated to all stakeholders. Teaching and learning activities are constructively aligned to the achievement of the expected learning outcomes. Teaching and learning activities enhance life-long learning. 	-Complete evaluation reports.	Chansa
5.Student Assessment (AUN-QA 5)	 The student assessment is constructively aligned to the achievement of the expected learning outcomes. The student assessments including timelines, methods, regulations, weight distribution, rubrics and grading are explicit and communicated to students. Methods including assessment rubrics and marking schemes are used to ensure validity, reliability and fairness of student assessment. Students have ready access to appeal procedure. Feedback of student assessment is timely and helps to improve 	- Speedy reports.	

learning.



Table 2. (Continued).

University (Manufacturer)	Activities	Needs for Information
6. Academic Staff Quality (AUN- QA 6)	 -Academic staff planning (considering succession, promotion, re-deployment, termination, and retirement) is carried out to fulfil the needs for education, research and service. -Staff-to-student ratio and workload are measured and monitored to improve the quality of education, research and service. -Recruitment and selection criteria including ethics and academic freedom for appointment, deployment and promotion are determined and communicated. -Competences of academic staff are identified and evaluated. -Training and developmental needs of academic staff are identified and activities are implemented to fulfil them. 	- Speedy reports.
7. Support Staff Quality (AUN-QA 7)	 -Performance management including rewards and recognition is implemented to motivate and support education, research and service. -The types and quantity of research activities by academic staff are established, monitored and benchmarked for improvement. -Support staff planning (at the library, laboratory, IT facility and student services) is carried out to fulfil the needs for education, research and service. -Recruitment and selection criteria for appointment, deployment and promotion are determined and communicated. -Competences of support staff are identified and evaluated. Training and developmental needs of 	- Up-to-date evaluation reports.
8. Student Quality and Support (AUN-QA 8)	 support staff are identified and activities are implemented to fulfil them. Performance management including rewards and recognition is implemented to motivate and support education, research and service. The student intake policy and admission criteria are defined, communicated, published, and upto date. The methods and criteria for the selection of students are determined and evaluated. There is an adequate monitoring system for student progress, academic performance, and 	- Speedy reports.

Table 2. (Continued).

Table 2. (Continued).			
University (Manufacturer)	Activities	Needs for Information	IIRIE
8. Student Quality and Support (AUN-QA 8)	 Academic advice, co-curricular activities, student competition, and other student support services are available to improve learning and employability. The physical, social and psychological environment is conducive for education and research as well as personal well- being. 	- Speedy reports.	314
9. Facilities and Infrastructure (AUN-QA 9)	 The teaching and learning facilities and equipment (lecture halls, classrooms, project rooms, etc.) are adequate and updated to support education and research. The library and its resources are adequate and updated to support education and research. The IT facilities including e-learning infrastructure are adequate and updated to support education and research. The standards for environment, health and safety; and access for people with special needs are 	- Complete evaluation reports.	10(4) (2021) 307-317
10. Quality Enhancement (AUN- QA 10)	 defined and implemented. Stakeholders' needs and feedback serve as input to curriculum design and development. The curriculum design and development process are established and subjected to evaluation and enhancement. The teaching and learning processes and student assessment are continuously reviewed and evaluated to evaluation and enhancement. 	-Speedy reports.	Chansamut Int. J. Res. Ind. Eng.
10. Quality Enhancement (AUN- QA 10)	 Quality of support services and facilities (at the library, laboratory, IT facility and student services) is subjected to evaluation and enhancement. The stakeholder's feedback mechanisms are systematic and subjected to evaluation and enhancement. 	- Correct and complete evaluation reports.	5
11.Output (AUN-QA 11)	 The average time to graduate is established, monitored and benchmarked for improvement. Employability of graduates is established, monitored and benchmarked for improvement. The types and quantity of research activities by students are established, monitored and benchmarked for improvement. The satisfaction levels of stakeholders are established, monitored and benchmarked for improvement. 	-Complete evaluation reports	



Customers	Desirable Qualities	Needs for Information
Graduated students	Having work performance skills.	- Information on the number of graduated students.

Table 4. Consumers, with activities and needs for information.

Consumers	Activities	Needs for Information
1. Entrepreneurs	Employing graduated students with desirable characteristics including good virtues and morality, good knowledge and intellectual skills, good human relationship skills, good responsibility, good numerical analysis skill, good communication skill, and good information technology usage skills, etc [2], [3], [4], [5] and [6].	- Questionnaires to assess the employer's satisfaction with the employed graduated student on various aspects of desirable characteristics.

Manufacturer: Manufacturer mean the university is regarded as a service provider university that produces graduated students. It performs the duty to transform raw materials, or entering students, into the finished products of qualified graduated students. The university will perform its duty of student Implementation and evaluation based upon quality assurance in education (AUNQA1 – AUNQA 11) of each activity, namely, expected learning outcomes, program structure and content, teaching and learning approach, student assessment, academic staff quality, support staff quality, student quality and support, facilities and infrastructure, quality enhancement and output. The final outcomes of the Manufacturer, ie. Graduates with desirable quality outcomes are delivered to the society.

Customers: Customers mean graduated student with desirable quality from the university.

Consumers: Graduate student identifies the society as the end customer or the consumer in this integrated supply chain. As universities are part of the society, the final outcomes of this supply chain, including graduates with desirable quality outcomes are delivered to the society as the end-of-process component of the supply chain information system model. They include the society in general and entrepreneurs who receive and/or employ the students who graduated from the university. Finally, the end product of qualified graduated students will provide added value to the supply chain [9], [10], [11], [12], [13] and [4].

The results of evaluation supply chain management information system model for quality assurance in educational management for AUN-QA is show in *Table 5* below:

No.	Items	$\overline{\mathbf{x}}$	S.D.	Suitability
1	Main components	3.56	0.51	High
2	Suppliers	3.60	0.61	High
3	Manufacturer	3.73	0.45	High
4	Customers	3.66	0.48	High
5	Consumers	3.60	0.50	High
		3.63	0.51	High

Table 5. The assessment of the suitability supply chain management information system model for quality assurance in educational management for AUN-QA.

Referring to *Table 5*, it is found that the experts agree that supply chain management information system model for quality assurance in educational management for AUN-QA is highly appropriate, with the total rating mean 3.63 and standard deviation of 0.51.

6 | Conclusion and Discussion

Supply chain management information system model for quality assurance in educational management for AUN-QA have five components: Main components and Minor ingredients namely Suppliers, Manufacturer, Customers, Consumers after the experts have evaluated, it was found that supply chain management information system model for quality assurance in educational management for AUN-QA shows the overall rating mean of 3.63 and standard deviation of 0.51, which means Supply chain management information system model for quality assurance in educational management for AUN-QA is considered to be highly appropriate and the design is according to the review of documents and relevant literature from both within and outside the country with the research of Chansamut and Piriyasurawong has studied supply chain and information system about educational [2] and [6]. Moreover, with the study of Chansamut it reveals that supply chain and information technology as well [3], [4], [6] and [7].

7 | Suggestions

Further in-depth studies should be conducted on the creation of required database for the developed model.

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