Conference Paper

Object-Oriented Approach: Applying ISO 21001 at Vietnamese Higher Education Institutions

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Abstract.

To evaluate whether an educational institution has quality or not, requires standards that reflect all the requirements of the complex relationships operating within the educational institution. At the same time, this standard must be recognized by all nations for it to apply widely. It is in this context that the ISO 21001:2018 series of standards was published. This standard mentioned three areas of activities that an educational organization must pay attention to: training, scientific research, and community service. They are also the main activities that the educational accreditation standards refer to.

To meet the requirement of quality guarantee and enhancement, a higher education institution has to apply quality assurance norms in general and quality criteria on management systems. Putting the ISO 21001 quality standard into practice is the choice of Vietnamese educational institutions to ensure they meet the requirements for improving management system quality. There are a set of quality system standards for educational organizations to satisfy their specific needs. Not following the traditional approach as they apply other ISO standard systems, Vietnamese educational institutions have chosen an object-base approach, where the beneficiaries are related to the management system of the university. They then approach the PDCA cycle to build and implement an ISO 21001 quality management system. We found that, according to this orientation, the implementation processes might be ensured given that the quality thresholds set by the university are met in order to satisfy the demands of the learners and related stakeholders.

The paper aims to analyze the approach of Vietnamese educational institutions in implementing ISO 21001 standards, and at the same time identify advantages and disadvantages in developing policies in the quality management system at educational institutions. The paper also gives recommendations that can be adjusted by management at other higher education institutions to improve quality assurance activities towards sustainable development.

Keywords: ISO 21001:2018, quality assurance, quality management system, PDCA (Plan-Do-Check-Act), sustainable development

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1. Introduction

In today's constant changing and highly competitive world, especially the shift from the old state to the new normal due to the impact of the Covid-19 pandemic, the need to affirm and maintain the quality of training at an educational institution in general, and the need to adapt to new training conditions in particular. This is also a mandatory requirement for educational institutions to meet development sustainably requirements in a volatile society. In today's world, there are many sets of quality assurance that can be applied to education institutions or programs, however, there are few sets of standards that are globally covered and accepted by every nation. The quality of education is the reflection of complex relationships between the educational institutions and their students, also reflecting the role of the students in the learning process (Douglas J. Gilbert, 2020)[1]. Therefore, educational institutions that are evaluated to be qualified or not require a set of standards reflecting all of the requirements of complex relationships in the operation of the educational institution.

In such a context, the ISO 21001:2018 sets of standards are born to meet the requirements of having a universal set of standards applicable to educational institutions and are globally accepted. The ISO 21001 specializes in quality assurance for the management systems of educational institutions. These sets of standards have mentioned the factors affecting the whole management system in areas that an educational institution should pay attention to teaching and research. These are also the main activities which the quality accreditation standards are directed towards. The ISO 21001 standard is aiming towards guiding educational institutions to provide better services and better educational products (Enis Emini, 2018)[2]. ISO 21001:2018 does not limit the object that need to be met in the word "customer", but expands the stakeholders that an educational institute needs to care about, including students, parents, employers, the government, the labor market, and the whole society...etc,

The institution compares ISO 9001 to ISO 21001 to find the improvement and the suitable points when applying the ISO 21001. There are some key differences between ISO 9001 and ISO 21001:

Beside, the institution also compares between ISO 21001 and Vietnamese institution accreditation standards to building processes which meet both of these standards. The comparison between 2 of these standards are shown below:

From these analyses, the Vietnamese education institution decides to apply ISO 21001 for building and improving the effectiveness of quality assurance activities.

Table 1: Comparison between ISO 9001 and ISO 21001.

Content	ISO 9001	ISO 21001
Organization	Apply for all of organization	Apply for organizations providing educational products and services
Focus on	Customer satisfaction	Satisfaction of learners and other beneficiaries (government, labour market, parents & guardians)
Additional terms	NA	Determine clearly other beneficiaries; Takes into quality policy account relevant educational, scientific and technical developments; includes a commitment to satisfy the organization's social responsibility; describes and includes a commitment towards managing intellectual property; considers the needs and expectations of relevant interested parties
	NA	Specify the requirements in education such as: Curriculum design Summative assessment Special needs education Indicators to measure Health and safety considerations for educational organizations
		...

2. Literature review

Quality assurance and quality enhancement are essential needs for not only organizations but also educational institutions. Quality assurance is not just about applying a paradigm in a prescribed manner, it requires continuous improvement to meet the expectations of beneficiaries in changing conditions (Mehmet Sıtkı İlkay, Emre Aslan, 2011)[3]. Therefore, organizations are increasingly focusing on assuring and improving the quality of the overall management system. More than that, organizations can create quality-oriented products in an environment where output and input are constantly changing, especially in this 4.0 technology era and the new normal era after today's Covid pandemic. The application of quality management standards has long been prioritized by organizations that need to prove their ability to consistently provide products and services, meet the requirements, and improve customer satisfaction. Aiming to enhance the quality of the management system, many organizations have applied the ISO 9001 set of standards enacted by the International Organization for Standardization. ISO (International Organization for Standardization) is an organization that sets international standards, which are recognized and applied worldwide. ISO 9000 is a set of quality management system standards, applicable to all types of organizations. In the ISO 9000 series of standards, there are 9001, 9002, and 9003 standards. However, organizations can only assess and certify based on the ISO 9001 sets of standards. In many studies, a systematic approach through the application of

Table 2: Comparison between Vietnamese institution accreditation standard and ISO 21001.

Vietnamese institution accreditation standard	ISO 21001
1. Strategic Quality Assurance	
1	B.2.1, B.2.4, 4.1, 4.2, 5.1.1 (m), 5.1.2, 5.1.3, 5.2.1, 5.2.4, 6.3, 7.3, 7.4.3.1, 9.1.2, 9.3.1, 10
2	B.2.4, 4.4.1, 5.2.1, 5.2.2, 5.3, 6.1, 6.3, 7.4, 9.3, 10.2, 10.3
3	B.2.1, 4.4.1 (h), 5.1.1 (b), 5.2.2 (b,c), 5.3, 6.2.1 (f), 6.3, 9.3, 10.2, 10.3
4	B.2.4, B.6.4, 4.4.1. 5.1.1 (l), 6.2, 6.3, 7.3 (a), 7.4.3.1 (a), 9.1.1, 9.1.4, 10.2, 10.3
5	4.4.1 (g), (h), 5.1.1 (b), 5.2.1, 6.3, 9.1.3, 9.1.4, 9.1.5, 9.3.1, 10.2, 10.3
6	4.4, 5.2.1, 6.3, 7.1.2.2, 7.2.1, 9.3.1, 9.3.2, 10.2, 10.3
7	B.9, 5.1.1 (m), 5.1.3, 7.1.1, 7.1.2, 7.1.4, 7.1.3, 7.1.6.2, 7.2.2, 8.1.3
8	B.7.4, 4.4.1, 9.1.3, 9.1.4, 9.1.5, 10.2, 10.3
2. Systemic Quality Assurance	
9	B.2.4, 4.4.1 (g), B.6.4, 4.4.1 (c), 5.1.1, 5.3, 6.2, 6.3, 7.3, 7.4, 7.5.2, 7.5.3, 9.1.1, 9.1.4, 10.2, 10.3
10	4.4.1 (h), 6,3, 10.2, 10.39.2, 9.3, 10.1
11	B4.4, B.6.4, B.11, 4.4.1 (h), 6.3, 7.5.3.2, 7.4, 7.5.3.2, 8.5.5, 9.3.1, 10.2, 10.3
12	4.4.1 (g), (h), 6.3, 8.4, 9.3.1, 10.2, 10.3
3. Functional Quality Assurance	
13	4.4, 4.4.1 (h), 6.3, 7.4.3, 8.2.2, 8.5.1.2.1, 8.5.1.2.2, 9.1.4, 10.2, 10.3
14	B.3.1, 4.2, 4,4, 4.4, 6.3, 8.1.2, 8.2.1, 8.3, 8.6, 8.7, 9.1.2.1, 10.2, 10.3
15	4.4, 5.3, 6.3, 7.1.2, 7.2, 8.1.2, 8.3.4.3, 8.3.4.4, 8.5.1.3, 8.5.1.6, 8.5.2, 8.5.6, 8.6, 9.1.4, 9.1.5, 10.2, 10.3
16	4.4, 6.3, 8.1.2, 8.3.4.4, 8.5.1.4, 8.5.1.5, 8.5.2, 8.5.4, 8.5.6,
17	4.4.1 (g), (h), 4.4, 6.3, 7.2, 8.1.2, 8.1.3, 8.2.2, 8.5.1.3, 8.5.1.6, 8.5.2, 8.5.5, 8.5.6, 8.7, 9.1.2.1, 9.1.3, 9.1.4, 9.1.5, 10.2, 10.3
18	B.6.4, 4.4.1, 6.3, 7.1.1, 8.1.1, 9.1.1, 9.1.4, 9.3.1, 10.2, 10.3
19	7.1.6.2, 5.2.1 (h), 6.3, 7.1.6, 7.5.3.2, 9.1.1, 9.3, 9.3.1, 9.3.2, 10.2, 10.3
20	4.4.1, 4.4, 6.3, 8.1.1, 9.3, 10.2, 10.3
21	B.6.4, B8, 4.4.1 ©, 5.1.1, 5.2.1, 5.2.2, 6.3, 8.1.1, 9.1.1, 9.1.4, 10.2, 10.3
4. The results of operation	
22	B.6.4, 4.4.1 (c), 9.1.1, 9.1.2, 9.1.3, 9.1.4, 9.1.5, 10.2, 10.3
23	B.6.4, 4.4.1 (c), 9.1.1, 9.1.4, 9.1.5, 10.2, 10.3
24	9.1.1, 9.1.2, 9.1.3, 9.1.4, 9.1.5, 10.2, 10.3
25	B.6.4, 4.4.1 (c), 9.1.1, 9.1.4, 9.1.5, 10.2, 10.3

the ISO 9001 series of standards benefits organizations in creating greater value for customers, building market share and increasing sales, reducing costs, increasing revenue and increasing asset efficiency (Paulo Sampaio, Pedro Saraiva, António Guimarães

Rodrigues, 2009)[4]. The ISO 9001 set of standards proposes a common management model for all organizations, regardless of the size, product, or field of the organization. Therefore, a small organization can also apply this set of standards (Briscoe et al., 2005, p. 310)[5]. However, some other studies show that ISO 9000 has a very limited effect on organizational performance (Mehmet Sıtkı İlkay, Emre Aslan, 2012)[6].

For educational institutions, the application of ISO 9001 in organizations is also a necessity when the need for continuous improvement to ensure quality to attract and retain students is rising, especially in this period when the whole world is affected by Covid-19. Another reason is that educational institutions are increasingly forced to make efficient use of their resources, accountable to governing bodies, investors, and other stakeholders (Jorge Gamboa, António; Filipe Melao, Nuno, 2012)[7].

The ISO 21001:2018 is built on the 9001:2015 standards. This is a quality management system standard for educational institutions. Switching to the application of ISO 21001:2018 standard helps educational institutions perfect the management system oriented to international standards, suitable for the activities of educational institutions, and not as generic as the ISO 9001 standard. According to S. M. Kovalenko1, O. S. Romelashvili1, T. V. Zborovska1, and O. D. Blagun (2020), when applying and complying with the ISO 21001:2018, organizations are beneficial by improving the efficiency of the educational institution management system, monitoring institutions, and the management procedure continuously to achieve the goal, meeting the requirements and expectations of beneficiaries and expand the participation of the interested parties (S. M. Kovalenko1, O. S. Romelashvili1, T. V. Zborovska1, O. D. Begun, 2020)[8]. The ISO 21001 gives an idea about the operating system model for educational institutions (EOMS), whereby processes are defined according to key aspects of an educational institution (Douglas). J. Gilbert, 2020)[9]. According to Ugwulashi (Ugwulashi, 2021)[10], ISO 21001 is a standard to measure the effectiveness of an educational institution, which can be applied as standard procedures are given to evaluate the university operation. With the above theories and research, educational organizations in Vietnam are determined to apply ISO 21001:2018 to improve the performance of the management system in particular and university activities in general. ISO 21001 concent to meet the learners' and other beneficiaries' requirements. Therefore, ISO 21001 is the foundation quality standard to work towards meeting the requirements for sustainable development

3. Methodology

The paper applies the benchmarking method and compares the ISO 21001:2018 with the ISO 9001:2015 and the sets of inspection standards to determine how to approach and apply ISO 21001:2018 at their institution. At the same time, this paper compares with the requirements of other educational institutions' accreditation standards to set off requirements for the institution's activities procedure. Besides, the author applies an object-oriented approach. This is the method that programmers use when building software that meets the needs of objects (Alexander S. Gillis, Sarah Lewis, 2021)[11]. This method focuses on the important objects that the system targets rather than the logical processes that have been performed so far. This method is being applied by educational institutions when developing a set of procedures to regulate activities according to ISO 21001:2018. Accordingly, key stakeholders are identified for each sector. From there, the educational institution determines the directed objectives and the essential activities be performed in the overall operation to meet the requirements of these important subjects.

Moreover, the authors use a case study approach when researching Vietnamese education institution in applying ISO 21001 to improve the efficiency of quality assurance work. Certain effects have been seen through the application of ISO 21001 at this institution. This can be considered as a successful example in applying ISO 21001 with a new approach.

4. APPLICATION OF ISO 21001 AT VIETNAMESE EDUCATION ORGANIZATION

Referring to ISO, people often refer to a number of ways of doing things such as "Do what you write", "Write what you do". This is a common practice when applying the ISO 9001 set of standards to the management systems that organizations often apply. With this approach, many organizations have successfully deployed and applied the ISO 9001 set of standards about the management system when building a set of procedures regulating the work to be done by the standard requirements. A set of procedures specifying the work steps to be performed from the first step to the last step for each activity. From there, organizations follow this set of procedures and control the implementation according to the developed set of procedures.

Higher education institutions in Viet Nam have been applying the ISO 9001 sets of standards for nearly 10 years. Previously, the University also applied the same common approach as other units. However, the old approach has some persistence such as:

- Many activities follow the correct procedure but do not really reach the quality standard when the process has not really set the quality threshold to be achieved or an effective process has not been built.

- Limiting the creativity of the teaching staff when they have to follow the correct process, especially those with rigid regulations.

- Can't focus on objects and actions that directly affect quality, but spread out according to the steps specified in the procedure.

By 2019, after the ISO 21001:2018 set of standards was published, the University has researched and applied it according to this set of standards. Starting to apply the ISO 21001 set of standards when the University has just achieved the quality accreditation of educational institutions according to the set of standards issued by the Ministry of Education and Training of Vietnam, meeting the quality accreditation of training programs according to ACBSP standards, the University has the condition to compare the ISO 21001 to set of standards to the requirements of these inspection standards, thereby providing an applicable approach to meet the requirements of effective management without creating cumbersome management activities when apply many different sets of standards at the same time.

Focusing on the benefited stakeholders highlighted in the ISO 21001 series of standards, the University has chosen an object-oriented quality-oriented approach that directly affects the quality of its operations. These are key objects that affect the quality of each activity in university.

First, the quality objectives of each process are determined. These goals concretize the vision and mission of the school into each activity. For each process, the object-oriented approach helps the school determine in each activity there are objects related to this activity, how the objects affect each activity, and what objects are which factors have a major influence on the quality of that activity. The determination of the level of influence by each object is seen in two dimensions: the influence of the object on the activity and vice versa.

From the needs of each object, the school determines what is the goal according to each process to achieve. These goals will guide the activities that need to be done under each process to respond to each object (and vice versa) and to achieve the goal of each process. The proposed actions are identified as mandatory activities to be performed (called quality activities) to achieve each activity's quality objectives, thereby contributing

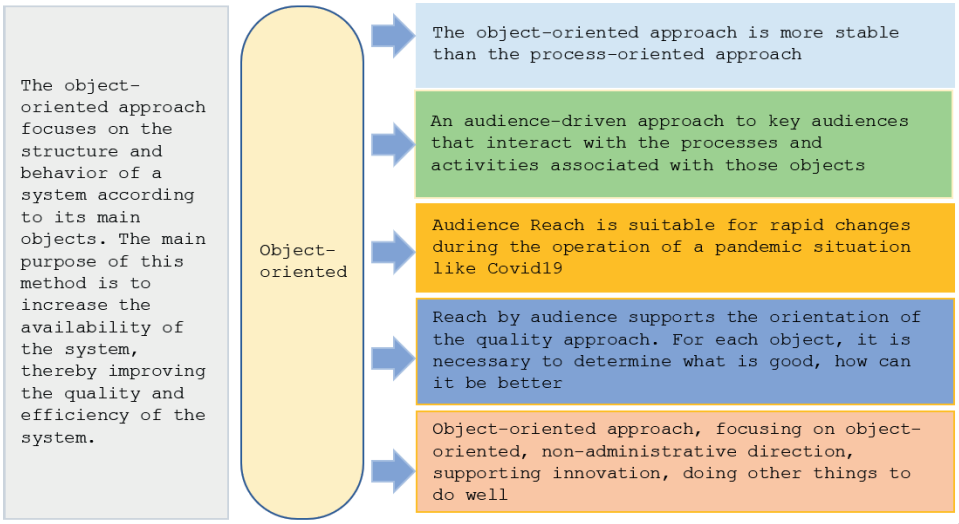

Figure 1: Description of the educational institution's object-oriented approach.

to the overall quality assurance of the whole university. When the requirements of these other beneficiaries are met, the operation process of the educational organization will be towards long-term and sustainable operation, because it solves the problems of the other beneficiaries mandarin. In addition, when the requirements of learners and beneficiaries are met, the educational institution will aim to contribute to the 17 sustainable development goals of the United Nations.

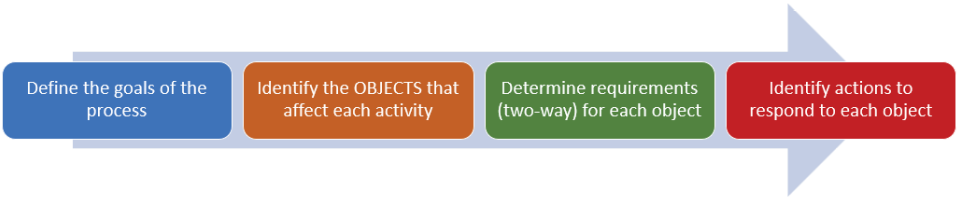

Figure 2: Describes the object-oriented approach for building processes according to ISO 21001.

The above quality activities are established and implemented according to the PDCA cycle, based on risk management thinking to ensure that activities with all elements are planned, implemented, checked, monitored, and enhanced after each cycle and there are specific profiles for each activity.

PDCA is a learning and development cycle, supposedly an innovation-driven invention by Dr. W. Edwards Deming, an American engineer. This is a cycle used by many organizations to continuously improve their operations. This cycle is also mentioned by the quality standards in the approach and implementation when applying these standards. The main principle of the PDCA cycle is to promote learning through repetition; findings and improvements from one cycle generate a new cycle with improved elements and further knowledge expansion (Nicolas Loyd, Sampson Gholston, 2016)

At each step in the PDCA cycle, the questions “what is a quality operation”, “how to do well” and “how to do better” are asked as the basis for developing the process. program for each activity. To answer these questions, setting quality criteria and quality products to be achieved in each activity is necessary, and quality records are required. At the same time, activities are reviewed against the requirements of other accreditation standards that the University is applying, to ensure that the quality requirements according to the standards are met. From there, each activity is built with a process to focus on the quality objects that affect the activity and how to do the job better, rather than listing the work steps without arrangements in priority.

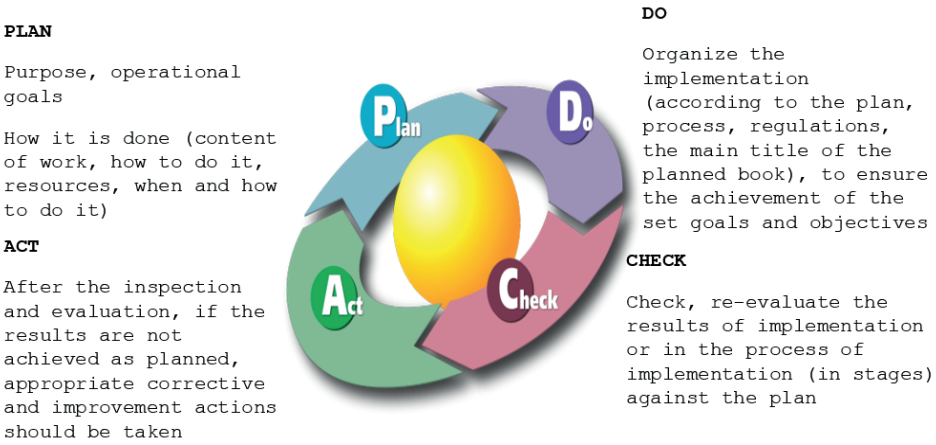

Figure 3: Building a process according to the PDCA cycle at the educational institutions.

This method of determining the activities to be performed in this object orientation can be understood as the path you have to go from A to F (A-B-C-D-E-F), in which points B and D are mandatory points that which quality must be checked. The rest C and E are points you can optimize by taking a different route or having other more creative ways of doing it without affecting the overall quality of the whole journey from A to F. At the same time, this approach helps the school identify and take action focused on the stakeholders directly involved to ensure the overall quality of the school.

5. ResultS

After 2 years of applying ISO 21001, the education institution in Viet Nam has achieved certain results when approaching this subject-oriented approach, specifically:

1. Building a set of subject-oriented processes, focusing on key activities that need to be performed and meeting the model of accreditation standards that the University is applying. This set of processes answers questions such as what is the subject of

focus of the process, what are the needs (2 dimensions) of this subject, what needs to be done to meet these needs and quality requirements, what is the required amount for the activity.

2. Associating the responsibility for quality assurance of periodic activities with the responsibility of each faculty staff in each department. When the process stipulates quality activities, job performance results are the quality results of activities, each faculty staff is responsible for quality assurance activities in their department in particular and quality assurance in the whole University in general. The Quality Assurance Department only plays the role of monitoring the implementation of these quality processes, and at the same time supporting the departments in reviewing and adjusting the processes when necessary.
3. The set of procedures stipulates the key activities, the activities that mainly affect the performance quality of the departments. For the rest of the activities, the faculty staff is free to be creative in order to optimize resources by each department, without forcing them to follow the same steps as in the old set of processes.
4. Profiles associated with internal quality assurance requirements have been incorporated into each process and met the quality accreditation standards that the University has applied, so that inspection is no longer a fear of the workload. work when it comes to the self-assessment stage and prepare for the external audit against the accreditation standards.
5. Disseminate the quality culture to each faculty member when setting quality targets to be achieved for activities affecting the overall quality of the department. These quality goals are closely tied to each specific job of each faculty member.

6. Conclusion

With the new approach in implementing the ISO 21001, the educational institution has gradually increased the responsibility of each faculty member in ensuring their quality.

The paper also opens a new direction in approaching the implementation of the ISO 21001 at the educational institute, in parallel with the application of other sets of educational accreditation standards. With this approach, the formation and dissemination of a quality culture is deeply and widely deployed to each staff and faculty member, attaching the responsibility of quality assurance to each staff and faculty member. At the same time, the paper also opens a new research direction to evaluate the long-term effectiveness of this approach.

However, this approach still has some limitations for educational institutions that do not have high self-discipline or are new, and still need detailed guidance. For these cases, if there is no detailed instructions, hands-on guidance, then it is difficult to implement and maintain object-focused orientation when building a set of procedures according to ISO 21001 because the faculty members are not experienced or have not voluntarily performed activities that are not in the procedure.

Through the above analysis, the ISO 21001 has covered the contents of other accreditation standards. The article opens a new applying direction when ISO 21001 can be applied to replace other inspection standards.

Besides, the paper gives some recommendations for other educational institutions when applying ISO 21001:

1. Identify the objects that directly affect the quality of each activity, then determine the actions to be taken to meet the needs of these objects.

2. Set the quality threshold required for activities that affect performance quality

3. Forming and disseminating a quality culture that is deeply and widely deployed to each staff and faculty member, attaching the responsibility of quality assurance to each of them.

4. Extensive communication awareness about the implementation of actions contributing to the sustainable development of all staff and students

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