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Submission date: 25-Sep-2020 01:27AM (UTC-0400)
Submission ID: 1396551703
File name: ESS-sadi,_Agus_Ristono.docx (96.16K)
Word count: 3266
Character count: 18105

Quality management system in the graduate program in industrial engineering UPN "Veteran" Yogyakarta using CIPP model

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Abstract

Post graduate programme competition requires magister programme to develop the quality management system. Many magister programme have adobted the quality management system ISO 9001:2015. To implement the ISO 9001:2015 certification in MTI UPN "Veteran" Yogyakarta, this research evaluate the condition of MTI UPN "Veteran" Yogyakarta today and how prepared MTI UPN "Veteran" Yogyakarta. Context-Input-Process-Product (CIPP) *was used to assess the readiness of MTI UPN "Veteran" Yogyakarta and then make the recommendations for preparing the ISO 9001:2015 certification. CIPP model evaluate from input and then process as well as the result of the process in MTI UPN "Veteran" Yogyakarta. The results show the input and process in MTI UPN "Veteran" Yogyakarta is good, but the out put is bad.*

Keywords: MTI UPN "Veteran" Yogyakarta, *quality manajemen system*, *Context-Input-Process-Product* (CIPP), ISO 9001:2015

I. INTRODUCTION

I.1. Background

Presidential Regulation (Perpres) Number 8 of 2012 explains that graduate program is a higher education that prepares students to have level eight and nine in certain fields. This is in accordance with the Presidential Regulation (Perpres) Number 8 of 2012. Based on the Presidential Regulation in article 5, learning outcomes for the graduate program must be at least equivalent to level 8, where article 2 paragraph 1 of the Presidential Regulation regulates the number of qualification levels. In this article, it is explained that Indonesian National Qualifications Framework (KKNI) consists of nine qualification levels.

The government's effort to improve the quality of study programs was making higher education management standard. The standard was in the Law on the National Education System (Sisdiknas) No. 20 of 2003. Article 51 stated that the management of higher education system was carried out based on the principles of autonomy, accountability, quality assurance, and transparent evaluation. The government further reinforced the law by issuing Government Regulation (Perpu) Number 19 of 2005 concerning National Education Standards. Article 4 of Government Regulation states that the National Education Standards aimed to guarantee the quality of national education. Thus, the achievement of the National Education Standards done by the study program meant that the study program must guarantee the quality of education it provided. This obligation was also emphasized by the Director General of Higher Education through the guidelines for the implementation of a higher education quality assurance system in 2008. This guidebook was later refined in 2010. The refinement resulted in a Higher Education Quality Assurance Guidelines, which had a target for universities to carry out quality education.

This study proposes an implementation plan of QMS based on the requirements of ISO 9001 using the Context-Input-Process-Product (CIPP) model. Many researches related to the implementation of CIPP in

education have been conducted. Mirzazadeh et al. (2016) have applied the CIPP in the field of medicine education. Yuniarti et al. (2018) use CIPP for vocational education, but the focus is on the field of industrial automation studies. Similar research with Yuniarti et al. (2018) is a study conducted by Kamaludin et al. (2018). The difference is that the research of Kamaludin et al. (2018) focuses more on work practices in industry even though the CIPP is also applied to vocational education. Researches from the two researchers - Yuniarti et al. (2018) and Kamaludin et al. (2018) – are later developed by Mukhidin et al. (2018). The developed research by Mukhidin et al. (2018) from the two previous studies combines the CIPP with the standard of ISO 9001 Quality Management System (QMS) in vocational education, but the focus is on the laboratory. The research of Mukhidin et al. (2018) is later corrected by Mahendra and Wiyono (2020). The improvement made by Mahendra and Wiyono (2020) on the previous research is the merger between CIPP and the standard of ISO 9001 Quality Management System (QMS) in vocational education as a whole without focusing on just one area.

II. LITERATURE REVIEW

System is a collection of components or elements, where these components or elements are interconnected because they carry out joint activities and influence each other to achieve certain goals (Karanikas et al., 2020). Basically, a system is a collection of elements that interact with each other in order to achieve specific goals (Daellenbach and McNickle, 2005). Thus, a system must be able to describe events but have real unity, such as places, objects, and people that actually exist and occur.

Components can also be known as system characteristics. These components ar of course the parts that make up a system itself (Karanikas et al., 2020). System components consist of (1) objects, (2) attributes, (3) internal relationships, (4) environment, (5) goals (Daellenbach and McNickle, 2005), (6) input, (7) processes, and (8) output (Nutt and Wilson, 2010). An object is a part or element known as a variable, so that its shape can be a physical object or ca be abstract or both. Meanwhile, attributes are components that can determine the quality or property of the system and its objects. There is internal correlation among objects. Thus, object relation is a component that connects one object to another object in the system.

Actually, environment is not a component of the system; it is a place or everything outside the system where the system is located but can affect the system. Meanwhile, a clear goal is part of the system, where each system must have a purpose, and this goal motivates each component of the system to interact. If there is no goal, the system will go out of control. A system has different purpose from other systems. To achieve the goal, it is necessary to have input, where this input is a component that goes into the system then turns into raw material to be processed in the system. This input can be something that is physically visible – for example raw materials – or things that are not visible - such as services. After then, the input is processed. Thus, process is a component that acts as an agent of change, so its function is to transform input into output that has added value and is useful - for example information - or useless - for example waste. The result of a process is an output. Thus, output is a component resulted from a process carried out in the system. For example, when discussing an information system, the output is information about one thing, which is the goal of the system, or it could be in the form of a report or something else.

There are many definitions related to quality management, but it can be understood that quality management is actually an activity of management function to make decisions about quality (Sallis, 2012). Thus, the process of its activities will include quality planning, quality control, quality assurance, and quality improvement in fulfilling the needs, desires, and expectations of customers, both for the present and for the future (Samani et al., 2017). The focus of quality management is in the process of continuous improvement in meeting customer satisfaction, but it is more oriented to a process that integrates all the resources owned by the organization.

III. RESEARCH METHODOLOGY

In a research about evaluation on the plan and implementation of ISO 9001:2015 QMS, many evaluation models have been used. However, a complete evaluation model is CIPP evaluation model (Hasan et al., 2015). This model evaluates the input activities, the process, and finally the product of the input

processing (Chinta et al., 2016). Furthermore, this model evaluates the context of an organization, so it does only cover the matter of transformation from input to process, and to output, but the characteristics of the existence of an organization is also evaluated (Gunung and Darma, 2019). This model views a program that will be evaluated as a system. Thus, the four elements evaluated - namely context, input, process, and product – become a complete series (Lippe and charter, 2018). However, in practice, an evaluator is not required to evaluate all of these elements if the focus or importance of the evaluation is only related to one or some of the elements in a program (Chinta et al., 2016).

In this research, CIPP model focuses more on evaluation, and that this approach only sees the program or project as one system (Gunung and Darma, 2019). Thus, if the program objectives have not been achieved, it can be seen in the process, which parts need to be fixed or improved. Evaluation using CIPP model will also help in the decision-making process, which is very useful for the benefit of organization, especially educational institution (Lippe and charter, 2018).

CIPP evaluation model is an evaluation model that has four components or elements of evaluation, namely context, input, process, and product (Lippe and charter, 2018). Actually, the components of CIPP evaluation model are part or sub-parts of an activity or activity procession. Context evaluation sentence means evaluation of context, while input evaluation means evaluation of input. The phrase "process evaluation" implies that evaluation is only a process, and "product evaluation" implies an evaluation of the results. CIPP evaluation model can generate recommendation for 4 (four) types of educational decisions, namely (1) determining educational goals, (2) determining the design of learning procedures, (3) determining procedural improvements, and (4) reviewing decisions based on reaction and impact generated by the procedure (Lippe and charter, 2018).

IV. FINDING AND DISCUSSION

4.1. The Description of the Research Data

The data collection of this research is used to measure how big the effects of the implementation plan of ISO 9001:2015 QMS at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta is on the graduate users' satisfaction of the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta. This data collection will then be adjusted to the CIPP Evaluation Model Checklist. This is done in order to find out what improvements the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta should make. In order to obtain the research data, it is through observation and questionnaires. There are two types of questionnaires distributed, namely (1) the questionnaires to measure the implementation plan of ISO 9001:2015 QMT in the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta, and (2) the questionnaires to measure the graduate users' satisfaction at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta.

Input aspect

The data sources obtained for the input variable are using questionnaires and documentation. To collect these data, the questionnaires are distributed to as many as 12 students for two weeks. For searching the other data sources that is done by documentation, is by observing and asking for the two-week documents at the teaching division. The data sources focus on the specifications of lecturers, students, as well as the infrastructure and facilities at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta. The input variables consist of three indicators: (1) the lecturers, (2) the students, and (3) the infrastructure and facilities.

The source of lecturer data is from the documentation of data collection. The indicator of lecturers with the descriptor of the comparison of lecturers and students is obtained from the documentation of the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta. The ideal comparison between lecturers and students is in accordance with the Government Regulation No. 74 of 2008, which states that the ratio between the number of lecturers and students is 1:15. The number of students at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta is 12 students (source: students' data as of August 2020). Meanwhile, the number of lecturers at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta are 6 students (source: students' data as of August 2020). Thus, the ratio between the number of lecturers and students at UPN "Veteran" Yogyakarta is 1:2. Based on the results of the data processing, it can be seen that the

input variable for the indicator of lecturers in the descriptor of the comparison of lecturers and students is rated 20 since it is in the category of the ideal value range.

The total results from the assessment of the indicators are then classified. Based on the data analysis results, the mean size of the implementation plan for the ISO 9001:2015 quality management system at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta, based on the input aspect, is 90 points from a maximum of 100 points, and is in the category of good achievement.

Process aspect

Process variable reflects the student satisfaction towards the lecturing process implemented at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta. This variable has a descriptor that is the students' satisfaction with the lecturers' performance, and the students' satisfaction with the lectures effectiveness. This variable is measured through the questionnaire method that represented the students' opinion of the lecturing process at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta. The questionnaires are in the form of checklist sheets with each consists of 5 answer choices, namely *strongly agree*, *agree*, *disagree,* and *strongly disagree*. The data obtained are then analyzed the description to produce the maximum data of 23, the minimum data of 11, the mean data is 18.85, and the standard deviation is 3.4. The data obtained are then classified according to the class intervals to find out the scores distribution.

Product aspect

The students' participation in the *Tri Dharma* of Higher Education has increased towards an increasing trend. In the academic year of 2019/2020, three students have participated in lecturers' research. In addition, in terms of student creativity activities, there are already two of students involved in the ownership of Intellectual Property Rights (HAKI) along with their lecturers. By looking at these data, it can be concluded that not all quality targets have been fulfilled yet.

Since there are three descriptors, the average score for all descriptors is the total value divided by three or equal to 33.33. These results are then grouped in the category achievement, which is then classified based on the predetermined category. By looking at the data analysis results, the mean size of the implementation plan for the ISO 9001:2015 quality management system at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta in terms of product aspects is 33.33 points from the maximum of 100 points, so it is included in the *less* achievement category.

The graduate users' satifaction

Data of graduate users' satisfaction is obtained from the users' satisfaction questionnaires distributed to the agencies and companies where the alumni work. In this variable, there are 4 indicators as considerations: (1) Expectation, (2) Performance, (3) Comparison, and (4) Confirmation or Disconfirmation. The data of graduate users' satisfaction are obtained by the questionnaire instrument then processed using the descriptive statistic, resulting in the maximum data of 67.00, the minimum of 47.00, the average data (mean) of 56.37, and the standard deviation of 9.34.

V. CONCLUSION AND FURTHER RESEARCH

V.1. Conclusion

The implementation plan of ISO 9001:2015 QMS at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta is classified as *very good* by looking at the input aspect, by achieving the score of 90 points from a maximum score of 100 points. This condition proves that with the achievement in the lecturer input indicator at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta has been in the *very good* range with the achievement being in the *ideal* category, with the ratio of lecturer **:** students of 1**:**2. The lecturers at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta have received certification, and all of them have a minimum doctorate degree, by 100%. Thus, it can be concluded that all lecturers are professional and competent, so they have met the *ideal* lecturer qualification. The input of students who are at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta is in the *good* category. This is proven by the average students' GPA of 3.65. Moreover, the infrastructure

and facilities at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta are in the *very good* category, with the average score or mean of 3.60.

V.2. SUGGESTIONS

The performance of the lecturers at the Graduate Program in Industrial Engineering in UPN "Veteran" Yogyakarta is already good and professional; still, there is something to note, which is the lecturers' awareness of the importance of effective and enjoyable lectures.

Acknowledgment

This research is funded by LPPM UPN "Veteran" Yogyakarta according to the agreement number **B/105/UN.62/PT/VII/2020**. The resarchers would like to thank LPPM UPN "Veteran" Yogyakarta and all parties that have supported this research.

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