University Strategic System Engineering based on BAN PT Accreditation Criteria One using SysML and Semantic Approach

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Abstract. An organizations business processes need to be precisely defined so that the organization does what it should do. Some quality standards such as BAN-PT and ISO 9001 Accreditation require organizations to carry out some process. Sometimes organizations find a difficulty to understand what processes need to be applied based on the standards. This study proposes a SysML and semantic method for analysing standard sentences and providing guidance on what needs to be applied to organizations. The trial was conducted on the Study Program Accreditation standard specifically criterion 1 on strategic management..

1. Introduction

The process of evaluating the implementation of standards is a process that uses internal and external resources. The evaluation is carried out by an independent organization that has an authority to assess whether the standard has been successfully applied or not. The assessment is a simplification effort. It is not necessary for all stakeholders to evaluate the application of standards, but rather an authoritative organization so that stakeholders can see results of the evaluation. Authoritative organizations will evaluate and provide a label so that people can simply see the label. The label can be in the form of a certification or accreditation decision letter.

The university also applies a quality standard that is regularly evaluated by BAN PT; National Higher Education Accreditation Board. BAN PT applies several standards to be met by universities. One of the goals of implementing these standards is so that each institution can continuously improve the performance of its organization. The granting of accreditation by BAN PT is a form of communication to the public that higher education has performance that is in accordance with the standards. The accreditation process is carried out by each higher education from the institutional level to the study program. The process is a process carried out in the hope that the community will be interested in becoming students at the relevant universities. Private universities becomes the party that gets the most benefit for the accreditation process if it is able to produce high scores because it will increase the bargaining power of the institution.

This accreditation process runs like a test or evaluation to a tertiary institution. The examination process is expected to be able to photograph the organization's achievements that have been planned since long ago. But there is a risk that the preparatory process for accreditation is not solid and far-reaching but rather sudden and patchy. There is a risk that the organization will make preparations that are suitable as cosmetics only and cover the weaknesses of the organization. The organization can try to cover up its weaknesses so that accreditation is not able to portray the reality of the condition of the

organization. The worst risk is that organizations commit lies such as designing fake documents, fake evidence, in order to get good grades in the accreditation phase.

The expectation of this accreditation process is maintaining quality so that stakeholders can get optimal benefits from the organization. This good quality can be achieved through a good and gradual preparation process starting from the design, organization, implementation, and control. The idea of this research is that every organization, in the preparation of the accreditation phase, can prepare it not suddenly but can start it from the design phase of an appropriate and robust system so that it can meet quality standards. The ideal condition to be achieved is the absence of the practice of lies in the accreditation process and the absence of sudden and temporary actions in improvement. The corrective action taken only to prepare for the accreditation. It will not result in a permanent improvement but only temporarily and cause problems later on. Explanation of the Object of Case Study.

There is some research that show the urgency to understand the strategic system; strategic aspect of startup business [1], Strategic Aspect in small medium enterprise [2], strategic aspect for environment issue [3]) and many more.

BAN PT Standard for Strategic aspect should implemented using robust framework so that the implementation will avoid unnecessary error. Unfortunately there is not any research that guide how to implement this BAN PT standard. There is some research that show about standard implementation, such as; Network design implementation [4], Psychiatric implementation [5], Integrated management implementation [6], agile manufacturing implementation [7], safety implementation framework [8]. But there is some relevant research to conduct research in standard implementation such as; ISO 9001 implementation [9], ISO 27000 Implementation Framework [10], and ISO 22000 implementation framework [11].

There are also several studies that also carry out the system modeling process as carried out by this research, for example; modeling the inventory system [12]; Queue System [13], employment system [14] [15], transportation and distribution system [16], [17], and many more.

2. Method

This research designs a framework that guides organizations to implement a standard. Existing standards often take the form of a sentence that requires an effort to convert it into a system. The system can be modeled in the form of several diagrams and graphs. The system will be partial information if it is modeled in sentence form because the sentence has limitations in interpretation. This designed framework guides the organization to interpret clause sentences into an organizational system design. The organization is an integrated system and there are several aspects of the system that need to be modeled. The initial stage of designing an organizational system is designing business processes. This framework, Standard Implementation Framework 1 (SIF 1), guides organizations to turn standard clauses into organizational business process models. The next stage of SIF will continue with this phase one which is part of the design of integrated systems such as organizational structure, procedures, information systems and others.

The basic paradigm of SIF is that the standards stated in the form of clauses are not only an obligation that must be fulfilled but also a guide for organizations to design their organizational systems in such a way that they will be able to meet the standards. These standards do not become an order from the leader to the subordinate to be fulfilled but also are the basis for the organization's leaders to design and engineer the organization. The design draft and organization design can have implications for business processes, organizational structure, job descriptions, minimum employee competencies, information systems, and so on. Then the flow of applying the standard is reversed from common false practice. The organization is not designed, then reads the standards, then tries to meet the standards. But standards become a guide in designing organizational systems so that each member of the organization unconsciously works according to standards without being forced to meet standards and without having to be bothered with the burden of thinking about standard clauses. Fulfillment of standard clauses does not occur in the middle of the organization and approaching the audit or accreditation phase, but rather standard clauses have been fulfilled since the organization has not been running and is still in the design stage.

Business processes become the starting point of the system design process because each system has a process that must be implemented. The process is a generic illustration to explain how organizations behave. Instead of describing organizations with organizational structures that often change, business processes are relatively fixed even though external changes continue to occur.

3. Result and Discussion

The following are the referenced standards [18]:

Standar Point A
The study program management unit is able to: 1) identify relevant environmental conditions comprehensively and strategically, 2) determine the relative position of the study program on the environment, 3) use the identification results and the position determined to carry out the analysis (SWOT / other relevant analysis methods) for the development of the study program, and 4) formulate an appropriate study program development strategy to produce appropriate alternative development programs

POINT 3
The management unit has: 1) a vision that reflects the vision of tertiary institutions and is under the umbrella of scientific visions related to the uniqueness of study programs and supported by consistency of implementation data, 2) mission, goals, and strategies that are aligned with the mission, goals and strategies of the tertiary institution and support the development of study programs with consistency in their implementation data

POIN 4
here is a documented mechanism for the preparation and determination of vision, mission, goals and strategies as well as the involvement of all internal stakeholders (lecturers, students and education personnel) and external (graduates, graduate users and experts / partners / organizations

POIN 5
The strategy to achieve the objectives is based on a systematic analysis and monitoring and evaluation are followed up on the implementation.

As a system's requirements, These guidelines and standards can be mapped into 4 categories commonly used in rich pictures, namely [19]:

1.Element of Process
2.Element of Entities
3.Interaction between element
4.System Process

The partial text and element mapping can be mapped using matrix plot elements as can be seen in table 1. The result of business process mapping are shown in picture 1.

Table 1. Sample of Semantic Analysis for Strategic Management Standard

Number	Text	Process	Entity	Interaction Between Element	System state
1	This standard is a reference to the quality of the organization and the strategy of the study program to achieve the future		Ideal Condition		Quality of study programs
2	The strategy and efforts to realize it, are understood and supported with full	Efforts to realize the strategy,	Stakeholders, Study Program Strategies		Commitment level

Number	Text	Process	Entity	Interaction Between Element	System state
	commitment and good participation by all stakeholders	Commitment Leadership			
3	The entire formulation is easy to understand, explained logically, the sequence and arrangement of the steps follows a flow of thought (logic) that is academically reasonable		Strategic formulation that is easy to understand, logical, sequential		
4	The strategy formulated is based on a comprehensive condition analysis, using valid and reliable methods and instruments, so as to produce a foundation of implementation and performance steps that are in a systematic, contributing and sustainable sequence.	Formulation with valid and reliable methods and instruments	Strategy, comprehensive analysis, systematic and contributing work steps	Between strategies are interconnected and systematic	

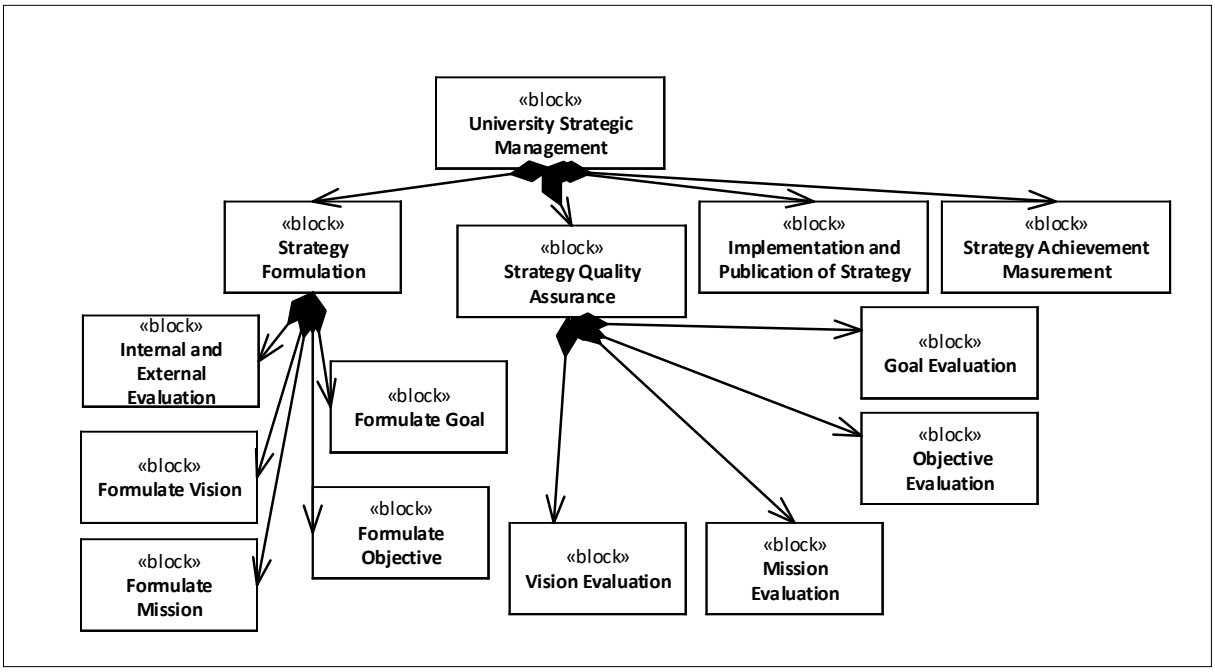

Figure 1. Block Definition Diagram of University Strategic Management System

4. Analysis and Conclusion

Process extraction from standard sentences is a process that can be said to be unstructured. Standard sentence is a product of thought from the standard formulator as outlined in the form of sentences and language. Human language produced by humans certainly involves unstructured elements from humans, especially those that involve emotions and intuition [20]. The potential for human involvement in formulating standards causes this process to become unstructured. Stages in translating back language and unstructured sentences are also carried out by humans which could be the process occurs unstructured.u

The obstacle faced is the potential for inconsistency in the extraction stage. Due to the unstructured sentences, languages, and human expressions involved in the formulation of standards or standard translations, there is a possibility of inconsistencies at all stages. This stage will depend on how the person is involved [19]. These constraints are still better than the absence of a framework or method in translating from standard. Previously the designers of the system read standard sentences and gave their

respective interpretations of how the system should be formed. Or even the system designer did not design a system based on standards. Standards only appear when approaching the certification or accreditation process. The system is designed into one form while the standard asks for another form. The existence of frameworks and methods for implementing these standards helps system designers to be able to apply standards in a disciplined manner. After the planning stage is completed, it can also be traced whether the system designed is in accordance with the standard or not.

Another obstacle faced is the length of the stages of this implementation. Process identification is a long process. The design of an organizational system is also a long process. The system designers need to be diligent in implementing this standard implementation method, although it requires a long time, but still provides great benefits for the organization. This Implementation Method, preventing the organization from doing the wrong process and does not meet the standards, which is caused by the design of the system without reflecting on the standard.

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