

SIMANTUL: Model of Internal Quality Audit Management System in Higher Education

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Abstract

Many organizations carry out the quality assurance system through the Internal Quality Assurance System (SPMI) and the External Quality Assurance System (SPME). The SPMI framework periodically conducts the stages of a continuous quality assurance cycle with the PPEPP method (Application, Implementation, Evaluation, Control, and Improvement) to achieve the Vision, Mission, Goals, and Targets of higher education. This paper discusses the implementation stages of the internal quality audit management system at Universitas Respati Yogyakarta, Indonesia. Using an information system, the university audit body, BPM, regularly and consistently carries out an Internal Quality Audit (AMI) every year to audit the implementation of academic and non-academic activities at the University. In this research, we construct an audit system, namely the E-Audit application, with the Waterfall software development method. This study can produce an efficient system called SIMANTUL, which refers to the Higher Education Accreditation Assessment Instrument version 3.0 and can store documents digitally.

Keywords

Information System, Internal Quality, Accreditation, University

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1. Introduction

Quality Management System (QMS) enables the organization to fulfill its purpose and mission, meet users and regulatory requirements, and continuously improve its effectiveness and efficiency. Quality Audit is a critical tool to ensure that the standards, policies, and procedures are applied in the organization as planned in QMS [11]. QMS audit is one of the quality tools to assist an organization in improving quality performance. They are commonly used to diagnose, maintain, and improve the quality management system. The organization must maintain its quality management system based on the ISO9001 Standard to undergo a series of audits [12].

In the education sector, the quality of management is the achievement of the vision, mission, and goals of education, graduate competencies, and academic standards that the tertiary institution will set. For tertiary institutions to increase the nation's competitiveness, they must continuously improve the quality of their education. Therefore, all academicians must be highly committed to sustainably implementing the Higher Education Internal Quality Assurance System (SPMI). Previous research generally concluded that this Standard generates positive effects for the companies implementing it. However, some studies do not reflect these benefits, or at least not in all situations [1].

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According to Harvey (1999), quality assurance ensures the effective management of resources, improving processes, and improving standard performance to meet stated goals and fulfill public accountability. It is constructed on three fundamental principles: Control, Accountability, and Improvement. Responsibility usually requires meeting stakeholder preferences. Monitoring means that agencies control resources and demonstrate how to achieve a high-quality outcome with available resources. Improvements allow institutions to obtain the necessary inputs, refine processes, and improve standard outputs to achieve stated goals [2].

Universitas Respati Yogyakarta (UNRIYO), Indonesia, has committed to sustainably implementing SPMI as quality assurance to ensure expected quality. It is to enhance an effort for continuous quality improvement through quality assurance cycle activities starting from Standard Setting, Implementation, Evaluation, Control, and Improvement (PPEPP). The University's Quality Assurance Agency (BPM) implemented quality assurance years ago. One of its functions is to carry out periodic evaluations through Internal Quality Audit (AMI) at the University, Agency, Center, Faculty, Study Program, and Bureau levels within the University. The audit results aim to obtain real material from management review materials to make quality decisions. The Auditor Team carries out the audit appointed to conduct quality audits, while the work unit is audited to ensure standard quality assurance management [3].

General requirements for the competence of testing and Calibration Laboratories, published in 2017, the concept of risk-based thinking was introduced in its requirements. Although the new version introduces the idea, procedures to be adopted for implementing risk management in testing and calibration laboratories are not addressed. The article is conceptual and summarizes information from the literature to assess the application of reputable risk management models and implement them in laboratories [4].

Education quality is essential since it has become the primary purpose of education management. The rate and mechanism of sustainable development and standard improvement are significantly required in education management [5]. In academia, quality management is a neglected topic that is sometimes seen as a barrier to progress. However, a quality system is mandatory for educational development and coaching, which has other positive impacts [6]. The quality assurance system helps universities face problems by resolving activities under regulatory standards and facilitating competition to achieve the highest [7].

Various approaches have been utilized to construct an effective internal process for quality management [8]. In the University, the Internal Quality Audit already refers to the SNP-PT. Still, along with the need for information and documents directly related to the components in the APT version 3.0 instrument with 9 (nine) criteria. It is necessary to make some improvements or updates to the system that has been running. The research aims to develop an Internal Quality Audit Management Information System (SIMANTUL) at the University, which is expected to quickly know the implementation of quality in all work units as material for management review meetings and plan follow-up of audit results.

2. Literature Review

Internal quality assurance is a systemic activity of quality assurance of higher education by each tertiary institution autonomously or independently to control and improve the implementation of higher education in a planned and sustainable manner. Quality assurance in higher education is carried out through the determination, implementation, evaluation, control, and improvement of Higher Education Standards (SPT) [2].

Internal quality audit is a systematic, independent, and documented testing process to ensure the implementation of activities in higher education according to procedures and

that the results are under standards to achieve institutional goals. An internal quality audit is one of the steps to determine the conformity of standards with the implementation that has been carried out on various aspects that have been determined [3]. A survey conducted in German higher education suggests that achieving a high level of quality assurance in higher education is primarily supported by higher education and education management in collaboration with other educational institutions. In addition, this author also emphasizes that “the role of quality managers as promoters of quality assurance shows a significant correlation with perceived effectiveness” [9].

In addition, a study examined the fundamental aspects of evaluating the impact of quality assurance in higher education to improve the quality development of higher education and to determine the effectiveness of the information provided by universities. Concerning this research, they surveyed stakeholders (students, teachers, employers, unique bodies for higher education quality assurance, curriculum leaders, university leaders, states, the general public, and the international community). Examine their views on how modern quality assurance systems in higher education have changed. As part of the research, it was found that the experience of the IQA procedure has the most significant influence on changes in quality assurance in tertiary institutions [10].

3. Proposed Method

In this paper, we develop the information system using the waterfall software development method, which is a systematic approach, starting from the system requirements stage and moving on to the analysis, design, coding, testing/verification, and maintenance stages [4].

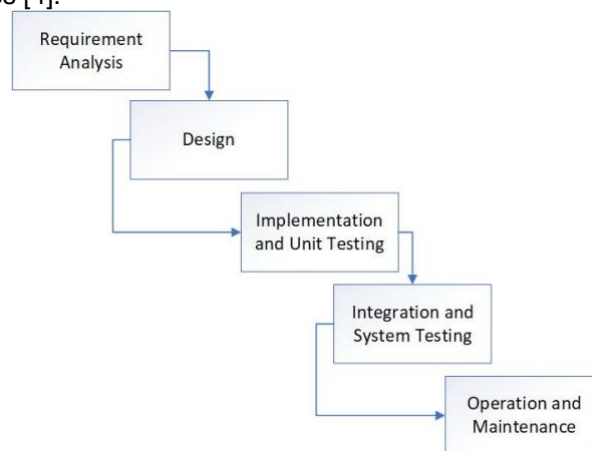


Fig. 1 Waterfall Model

To construct the information system, we implement the waterfall model as a compound of activities into linear sequential phases, meaning they are passed down onto each other, where each stage depends on the deliverables of the previous one and corresponds to a specialization of tasks. The system's development tends to be among the less iterative and flexible approaches, as progress flows through the phases of conception, initiation, analysis, design, construction, testing, deployment, and maintenance. Waterfall project management is a sequential approach that divides the SDLC into distinct phases in software development.

4. Experimental Setup

4.1 Requirements Analysis

This information collection method can be obtained in various ways, including discussions, observations, surveys, interviews, etc. The information obtained is then processed and analyzed to obtain complete data or information regarding the specification of user requirements for the software to be developed. Accepted system requirements are as follows:

- Analysis of the needs of universities, faculties, study programs, and non-academic work units: can fill out internal quality audit forms online
- Quality Assurance Auditor needs analysis: can evaluate the contents of internal quality forms Leaders, auditees, and auditors: can see the results of entries, and assessment reports in the form of data tables and graphs

4.2 System and Software Design

Design planning is to help to provide a complete picture of the system. In designing using architectural models and process models

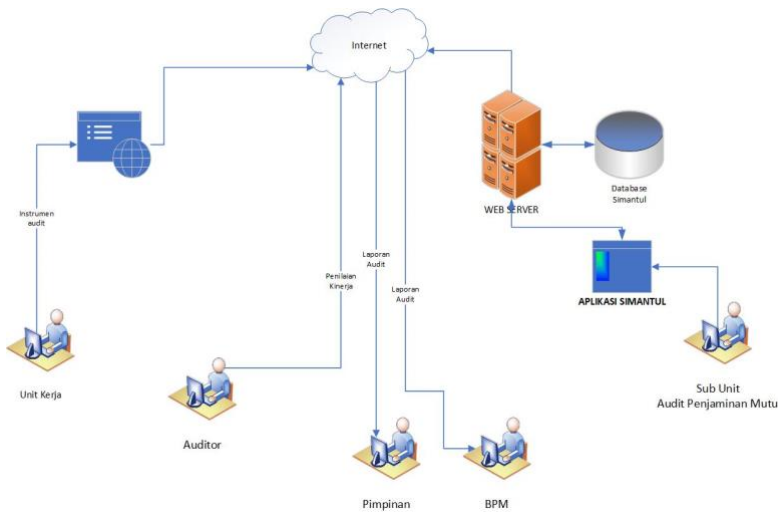


Fig. 2 Model Architecture

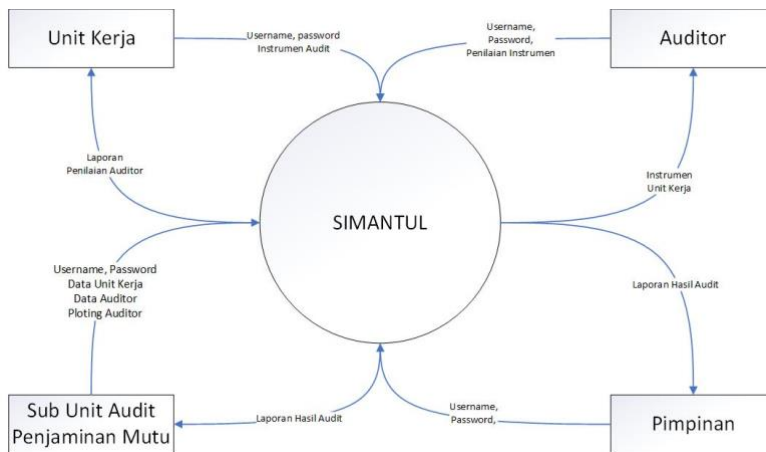


Fig. 3 Process Model

4.3 Implementation

The implementation and unit testing stages are the programming stages. The software is divided into small modules, which will be combined later in the next stage. The modules under development are:

1. University Form Module
2. Faculty Form Module
3. Study Program Form Module
4. Non-Academic Work Unit Form Module
5. Auditor Assessment Module
6. Report Module

Implementing e-audit in higher education can be an innovative method to evaluate quality management system audit results.

5. Result & Analysis

All the units or modules will be integrated into the overall information system at the implementation stage. After the integration process is complete, further system inspection and testing will identify possible system failures and errors. Fig. 4 depicts the results of information system development using the waterfall development approach:

Fig. 4 Form for filling in internal quality forms

In addition to audit committee members completing the form as a self-evaluation, ask individuals who interact with the audit committee members too. Fig. 5 depicts the evaluation

form by the auditor in the new application.

No	Elemen	Indikator	Skor	Penilaian	Keterangan
1	Visi, Misi, Tujuan dan Sasaran	Perguruan Tinggi memiliki rencana pengembangan jangka panjang, menengah, dan pendek yang memuat indikator kinerja dan targetnya untuk mengukur ketercapaian tujuan strategis yang telah ditetapkan.	2	2	Temuar
2	Tata Pamong, Tata Kelola dan Kerjasama	Ketersediaan dokumen formal sistem tata pamong sesuai konteks institusi untuk menjamin akuntabilitas, keberlanjutan dan transparansi, serta mitigasi potensi risiko.	2	1	Temuar
3	Tata Pamong, Tata Kelola dan Kerjasama	Ketersediaan bukti yang sah terkait upaya institusi melindungi integritas akademik dan kualitas pendidikan tinggi.	2	2	Temuar
4	Tata Pamong, Tata Kelola dan Kerjasama	Ketersediaan dokumen formal struktur organisasi dan tata kerja institusi beserta tugas dan fungsinya	2	2	Observ
5	Tata Pamong	Ketersediaan bukti yang sah terkait praktik baik, perwujudan Good University Governance (oaling tidak			

Fig. 5 Evaluation Form by the Auditor

Audit quality is described as correlating with quality management practices carried out by the University. Fig. 5 depicts the internal quality audit report obtained from the e-audit system in this study.

Periode Tahun	unit	No.	Indikator	Skor	Informasi pada Aplikasi SIMANTUL	Informasi pada saat Validasi	Kategori Temuan
2020	Rektorat	1	Perguruan Tinggi memiliki rencana pengembangan jangka panjang, menengah, dan pendek yang memuat indikator kinerja dan targetnya untuk mengukur ketercapaian tujuan strategis yang telah ditetapkan.	2	Perguruan tinggi memiliki: 1) rencana pengembangan mencakup: jangka panjang, jangka menengah, dan jangka pendek. 2) indikator kinerja, 3) target, dan 4) bukti pelaksanaan pengembangan. SKOR 2	2	Temuan Mayor
2020	Rektorat	2	Ketersediaan dokumen formal sistem tata pamong sesuai konteks institusi untuk menjamin akuntabilitas, keberlanjutan dan transparansi, serta mitigasi potensi risiko.	2	Perguruan tinggi memiliki dokumen formal sistem tata pamong yang dijabarkan ke dalam berbagai kebijakan dan peraturan sesuai konteks institusi serta menjamin akuntabilitas, keberlanjutan, transparansi, dan mitigasi potensi risiko. SKOR 2	1	Temuan Minor
2020	Rektorat	4	Ketersediaan dokumen formal struktur organisasi dan tata kerja institusi beserta tugas dan fungsinya	2	Perguruan tinggi memiliki dokumen formal struktur organisasi dan tata kerja institusi yang dilengkapi tugas dan fungsi guna menjamin terlaksananya fungsi perguruan tinggi. SKOR 2	2	Observasi

Fig. 6 Internal quality audit results report

To conduct software testing, we utilize the Blackbox method, with the following testing result:

Table 1. Testing with the black box test

No	Scenario	Test Case	Expected Results	Conclusion	Category
1	Auditees can fill out the internal quality audit form Auditee can fill out the form in the form multiple choices of questions on the form	The auditee can fill out the form in the form of multiple choices based on the questions on the form	Selection of multiple-choice answers can be made, and answers can be saved	According to expectations	Valid
2	The auditor can assess the results of filling out the forms that the auditee has filled in	The auditor can fill in an assessment in the form of a list of value choices from the results of the auditee's answers	The auditor can fill in the assessment by using a list of options	According to expectations	Valid
3	Auditors and auditees can see the report on the results of the assessment in the form of graphic tables and documents	Auditors and auditees can see reports on the results of the assessment in the form of tables, graphs, and documents based on a specific period	Auditors and auditees can see reports on the results of the assessment in the form of tables, graphs, and documents for a certain period	According to expectations	Valid

6. Conclusion

The quality assurance system is implemented through the Internal Quality Assurance System (SPMI) and the External Quality Assurance System (SPME). In this study, we construct a development model of the information system of SPMI and SPME using the Waterfall approach at Universitas Respati Yogyakarta. The implementation results of the new e-audit application show a significant positive relationship between audit quality results and the digital system model. It proves that reasonable objectivity will improve the quality of audit results. The results of multiple regression testing on the influence of Integrity on the Quality of Audit Results show an insignificant relationship. It proves that implementing an effective digital system affects the Quality of Audit Results in higher education. The results of BlackBox testing on the Quality of Audit show significant positive results and prove that good information system implementation will improve audit results quality.

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