E-MONITORING PERFORMANCE LECTURER BASED ON CLOUD COMPUTING SYSTEM

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ABSTRACT

Lecturers in study programs make a major contribution to the quality of study program accreditation, particularly in the upcoming IAPS 4.0 completeness. The lecturer base needs to be managed through a concrete, transparent, structured, comprehensive, and accountable system. Lack of data management in lecturers at the Mechanical Engineering Education / PTM Study Program so far is still paperless based so that it is less effective, efficient, having to copy documents, and tends only to collect data close to the accreditation of study programs. This research aims: (1) to produce e-monitoring products on the performance of lecturers based on a cloud computing system; (2) knowing the level of feasibility of e-monitoring products on the performance of lecturers based on cloud computing system at PTM Study Program. The research method uses Research and Development (R&D), which adopts the ADDIE (Analysis-Design-Development-Implementation-Evaluation) model. The research sample was 11 PTM lecturers. Validators of eligibility included the chairman of the LPM and the chair of the UST IT team. The instruments used included questionnaires and documentation. This research succeeded in producing a product in the form of a cloud computing system with a private cloud type with the Platform As A Service (PaaS) model. The data used as an assessment of lecturer performance include governance, HR performance, education performance, research performance, and service performance. The results of expert assessments obtained an average of 91.25%, which shows that this system is very feasible to use. While the evaluation results of the system implementation showed that 90% of PTTM lecturers were able to understand and skillfully operate the cloud system, thus this system is very feasible to be used as e-monitoring of lecturer performance that is accurate, accountable, objective, and safe to use.

Keywords: cloud system, lecturer, internet, monitoring

INTRODUCTION

The National Accreditation Board for Higher Education has determined the format for the use of the Study Program Accreditation Instrument (IAPS 4.0) for each study program that will propose new accreditation or reaccreditation. The IAPS 4.0 instrument is oriented towards outputs and outcomes and consists of 2 parts: 1) Higher Education Performance Report (LKPT), and 2) Higher Education Self Evaluation Report (LED).

The preparation of accreditation forms requires good cooperation, especially the study program management unit (UPPS), with the study program for which the accreditation will be proposed. The study program plays a more technical role to help the formation of forms. Achievement of Accreditation Value A requires a mechanical engineering education / PTM study program to continuously develop themselves in various fields that are in line with the development of science and technology. This development includes learning the infrastructure, human resources (lecturers), and management of management. The development of learning infrastructure is continuously improved both in terms of quantity and quality. The development of human resources is directed to increase lecturers in the implementation of higher education.

Current conditions in the PTM study program are still using portfolio model as lecturer databases, where weaknesses are less effective, less structured in monitoring lecturer performance development; archived data cannot be directly upgraded according to the type of tri dharma activities carried out by lecturers, lecturers tend to be lazy in archiving their personal data because they have to copy and collect it in the administration department of study program. This weakness is what needs to be followed up by creating a new system that facilitates the storage of lecturer databases, whenever and wherever, which can be directly reported in the system, either through the laptop or the lecturer cell phone. Mell and Grace (2012: 2) mention that cloud computing is a model that allows for ubiquitous, convenient, on-demand network access to computing resources that can be quickly upgraded. Cloud computing is an information technology service that can be utilized by internet-based users. Sarga (2012) emphasizes the benefits of cloud computing systems, which are commercially and socially viable, time-efficient features that can be utilized by the government, city administration, and universities. Then Satra and Irawadi (2016) developed a cloud system in the academic field in the form of a prototype of archiving of research data of lecturers and was successfully tested using a static IP with class full basis division. Furthermore, Aini et al. (2019) implemented a cloud system in the field of accounting and proved to be accurate and precise and had an

impact on the ease of reporting in the leadership of the university.

The cloud computing system developed in this study is a private cloud model with the As A Service (PAAS) platform, which is directly utilized by lecturers.
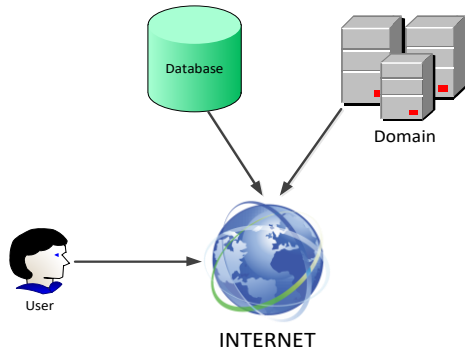

Figure 1. The working principle of e-monitoring the performance of lecturers based on Cloud Computing System

The database in the storage includes lecturer data in accordance with National Higher Education Accreditation Agency Regulation No. 2 of 2019 which is aligned with the needs of IAPS 4.0, namely C2 (public leadership, organizational leadership); C4 (further studies, seminars/conferences, workshops, symposiums, monumental rewards/achievements); C6 (RPS, college contracts, teaching materials, UAS and UTS questions, job sheets); C7 (research contracts, research reports, research outcomes); C8 (research contract, service report, service outcome). Lecturers can, at any time, upgrade their personal data by logging in with their respective usernames and password and can see statistics on the development of their performance and ranking at the study program level. So that lecturers can be

motivated to always develop themselves with quality assurance that is increasingly progressive or sustainable.

RESEARCH METHODS

This study uses the Research and Development (R / D) method because it produces a product in the form of a cloud computing-based lecturer database e-monitoring system that will be tested for the system's suitability. The development design is aligned with the ADDIE (Analysis-Design-Development-Implementation-Evaluation) model. This model uses five stages of development namely, as shown below:
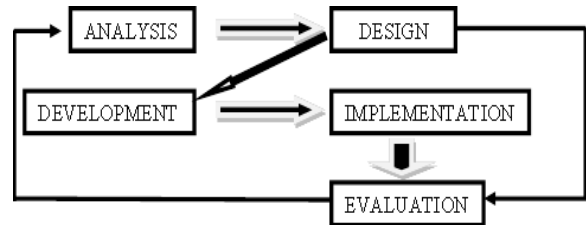

Figure 2. Research steps adopting the ADDIE Model (Steven J. M.: 2000)

The research method describes the type of research, time and place of research, targets, research subjects, procedures, data collection techniques, instruments, and data analysis techniques. The research method is presented as needed.

The research subjects were selected by PTM Study Program Lecturers, where the sampling technique used was saturated sampling. The total research subjects were 11 lecturers. Data collection techniques using questionnaires and documentation. The type of data in this research is quantitative descriptive.

The workflow of the e-monitoring system of lecturer performance based on Cloud Computing System which will be developed in this study starts from (1) the lecturer registers at the system's web address; (2) the lecturer gets a login code via email; (3) the lecturer login to the system for data entry C2-C4-C6-C7-C8; (4) calculation of lecturer-level ranking of study programs based on statistical performance data development; (5) lecturers receive ratings on their performance. Thus, lecturers can upgrade data wherever and whenever according to the form of C2-C4-C6-C7-C8.

RESULTS AND DISCUSSION

1. Cloud Computing System Products

The results that have been achieved from the implementation of this research are the production of cloud system products for DTPS PTM (Permanent Lecturer of Mechanical Engineering Education Study Program) with the https://dtps.rzqn.me page. To activate the account.

Figure 3. Account registration

Then login account according to user id and password. The user is obliged to upload
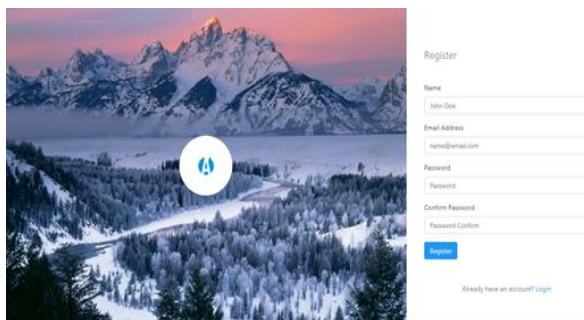
documents in the form fields according to

forms C2 (civil service performance) -C4 (HR performance) -C6 (education performance) - C7 (research performance) -C8 (service performance).

Figure 3. Forms for each performance

If all of the lecturers have filled out the form, the overall ranking can be seen.

Figure 4. Results of lecturer performance ranking

The criteria for evaluating document form in the system are: (1) Form C2 Performance of Civil Service Planning includes (a) Public leadership with assessment criteria: Local (scale 4), National (scale 6), International (scale 10); (2) Form C4 Human resource performance includes (a) Lecturer Education with assessment criteria: S3 Domestic (scale 8), Overseas S3 (scale 10), S2 Domestic (scale 4), S2 Overseas (scale 6) ; (b) Academic Position with evaluation criteria: Professor (scale 10), Head Lecturer (scale 8), Lecturer (scale 6), Expert Assistant (scale 4); (c)

seminars / conferences with assessment criteria: national (scale 6), international (scale 10); (d) workshops and / or symposiums with assessment criteria: local (scale 4), national (scale 6), international (scale 10); (e) Achievements with rating criteria: Local (scale 4), National (scale 6), International (scale 10); (3) Form C6 Education Performance includes (a) semester learning plan documents and lecture contracts with assessments for theoretical courses: Complete according to standards (scale 10), Complete lack of standards (scale 8), Incomplete (scale 4) and for Complete assessment practice courses according to the standard (scale 10), Complete does not meet the standard (scale 6), Not complete (scale 2); (b) teaching materials and or jobsheets with assessment criteria: ISBN (scale 10), internal publisher Diktat UST (scale 6), Non-publish (scale 4); (c) midterm exam questions for assessment theory theory courses: Complete has been validated (scale 10), Complete has not been validated (scale 6), Incomplete (scale 2) and for Practical Courses assessment criteria: Complete has been validated (scale 10), Complete has not been validated (scale 6), Not complete (scale 2); (d) Final semester exam questions for assessment criteria theory courses: Complete has been validated (scale 10), Complete has not been validated (scale 6), Incomplete (scale 2) and for practice assessment courses: Complete has been validated (scale 10) , Complete not validated (scale 6), Incomplete

(scale 2); (4) Form C7 Research Performance includes (a) research contract assessment criteria: Internal grants (scale 6), external grants (scale 10); (b) the assessment research report: Internal grant (scale 6), external grant (scale 10); (c) research outputs assessment criteria: accredited national journals (scale 6), national journals (scale 4), Scopus indexed international journals (scale 10), international journals (scale 8); (5) Form C8 Service Performance includes: (a) Service contract evaluation criteria: Internal grants (scale 6), external grants (scale 10); (b) service evaluation report on assessment criteria: Internal grant (scale 6), external grant (scale 10); (c) outputs for the assessment criteria: accredited national journals (scale 6), national journals (scale 4), Scopus indexed international journals (scale 10), international journals (scale 8).

The developed system was socialized in the Focus Group Discussion (FGD), which was attended by the head of the sim bureau and the quality assurance agency ust. Based on the results of the discussion obtained several notes for improvement, including the addition of information on the form provided in accordance with the criteria in Form 4.0 and equipped with a guide to operating the cloud computing system for the lecturer's performance. Furthermore, the average rating of experts in the FGD forum can be seen in the diagram below.
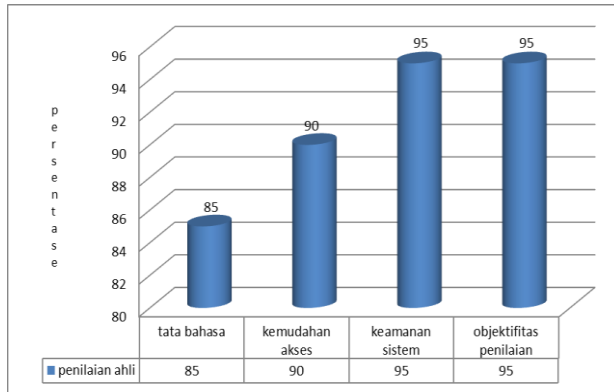
Figure 5. Results of expert judgment

Thus this system is very feasible to be used as e-monitoring of lecturer performance that is accurate, accountable, objective, and safe to use.

1. Product Implementation

Figure 6. Product Outreach Activities

Products that have been developed are socialized to PTM lecturers. In this activity each lecturer tries to upload a document in accordance with the criteria in the system, starting from data (1) C2 public leadership; (2) C4 Human resource performance; (3) C6 Educational Performance; (4) Research Performance; (5) Service Performance. Based on the results of the socialization, 90% of lecturers can understand the procedure of operating the system. Thus the cloud system is feasible to use and can be further developed so that it can be used by all study programs in the UST environment.

The quality of education is very dependent on human resources (lecturers) in tertiary institutions. Indicators of the quality of lecturers can be seen from the performance of the lecturer. This performance is very important to be monitored and evaluated as a reference for improving quality, measuring the achievement of study programs and university strategic plans, and important as one of the determinants of accreditation results. The performance instrument contained in the lecturer performance evaluation criteria is based on a cloud computing system with a type of private cloud. Peter Mell and Timothy Grance (2012) mentioned that the type of private cloud is safe for use as data storage. Likewise, the performance appraisal has been relevant to the requirements of the criteria in 4.0 4.0 as stipulated in the Higher Education National Accreditation Agency Regulation Nomor 2 of 2019 so as to facilitate the completeness of the evidence forms documents later. Rating with a precise scale in the system proves that performance is assessed objectively through a ranking system. Furthermore, the ranking can be used as a basis for rewarding.

CONCLUSION

The cloud computing system is effectively used for e-monitoring lecturer performance. The advantage of this system is that it can monitor lecturer performance accurately and accountably, can provide an objective performance assessment, and the data stored in the system is secure.

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