PROTOTYPE OF CLOUD BASED DOCUMENT MANAGEMENT FOR SCIENTIFIC WORK VALIDATION

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***Abstract*— One of the main tasks of lecturer is to conduct research faculty and publish research results in a scientific paper. To avoid plagiarism, University of Udayana commissioned the University Quality Assurance Agency (BPMU) and each faculty to validate the scientific work of lecturers. At the university level work files are uploaded through the system, while at the faculty level are still using physical file. If the validation process at both the faculty and the university can be done through one door, then the time and cost required can be minimized. However, scientific work digitizing system also has shortcomings because it takes a large storage media. Therefore we need an information system validation scientific work that is supported by the efficient management of storage media.**

This study will be conducted over two years with a case study in the scientific validation process in Unud. In the first year, the study was divided into several processes such as system need analysis, system architecture design, implementation code, test and evaluation. At this stage of the second year, the study will focus on further exploration technologies Cloud Computing and Cloud Storage.

Outcomes achieved in this study is the first year: Scientific Validation System, International Seminar Dissemination, Publication in the National Accredited Journal. While in the second year: Scientific Work System Applications, International Seminar Dissemination, Publication in the National Accredited Journal.

Keywords*— *system for scientific paper validation, cloud based document management

I. Introduction

As mandated in UU No. 14 year 2005 on Teachers and Lecturers, lecturers are expressed as professional educators and scientists with the main task of transforming, developing, and disseminating science, technology, and arts through education, research, and community service (Chapter 1 Article 1 paragraph 2). Meanwhile, professionals are expressed as jobs or activities carried out by someone and become a source of income that requires expertise, skills, or skills that meet certain quality standards or norms and require professional education.

A case of plagiarism in 2010 by a professor gave setbacks to education in Indonesia and should be taken as a lesson to prevent it from happening again in the future. The president and professors of the university are encouraged to give insight to prospective professors to act commendable and have individual awareness that a professor is a respectable position both in academia and in the community. Improvements should be made on the process of achieving the rank of a professor and must be accompanied by a rigorous selection process.

Udayana University, as the largest state university in Bali, are concerned with preventing plagiarism among its lecturers. The Regulation of the Udayana University President number 2 in 2012 stated that all scientific papers of lecturers that will be used for academic needs (promotion and academic positions) must be validated in stages. The validation process starts from the Faculty / Department and ends at the University. This move is expected to create a better scientific culture, and prevent the occurrence of scientific dishonesty in the university. On the other hand, the policy of Directorate General of Higher Education (DIKTI) also explicitly states that if there is scientific fraud such as plagiarism in any scientific works that are used for gaining academic promotion, then the sanction is given not only to the perpetrator, but also to the institution in which the entire promotion and academic positions which occurred in the same year will be disallowed.

Based on this, Udayana University through the Quality Assurance Agency (BPMU) published a guide or manual procedures to validate the scientific work. The standard operating procedure (SOP) for validating scientific work in Udayana University include steps required and things that need to be validated as well as the duties and functions of the Scientific Validation Team. The SOP is made with reference to the regulations of the Minister, DIKTI and also regulations of the President of Udayana University. It is expected that each faculty to know and comply with the steps in validating the publication of scientific works (BPMU, 2012).

However, in practice, there is still an issue on the validation process between the faculty and the university. The scientific work files that have been uploaded through the current system was not used in the execution of validation.

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Thus, the validation process still needs the hard copy of the scientific paper.

Based on this problem, it is necessary to develop a system that is able to perform validation and review in an integrated manner and only use softcopy of the scientific paper. This approach would gain some advantages, among others:

1. Paperless, because we only use the softcopy version of the article.
2. Safe, no file would be lost.
3. Better searching, by using the integrated system, each person who takes part in the validation process will have a better way of searching for files..

II. Cloud Technology

Cloud computing is a subscription-based service that provides access to the storage space and computer resources connected to the network. One-way to understand cloud computing is to think about the experience of using email. Email service providers like Yahoo, Gmail, Hotmail, etc., take care of the problems associated with the software and hardware needed to support personal email account users. When the user wants to access email so he only needs to open the browser on his computer, typing in their email address and login providers. The most important part of the process is the availability of internet access. Email users are not physically stored on his personal computer, he can access it anywhere with an internet connection.

[1]

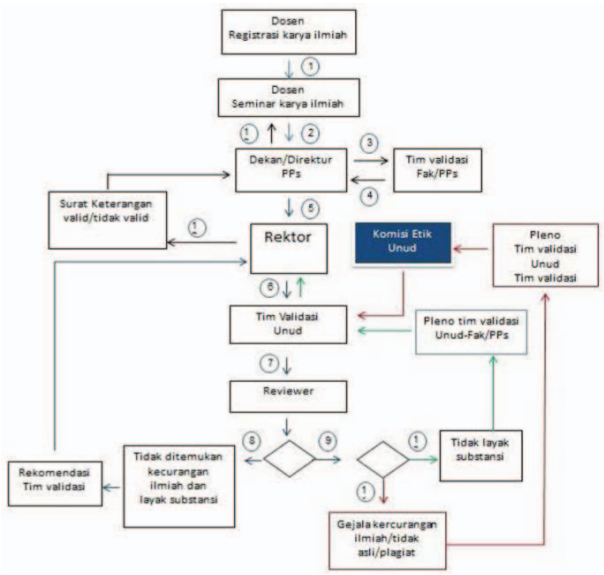

Fig. 1. Flow diagram for validation of Scientific works

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III. Scientific Work Validation in Udayana University

The scientific work is valid if it meets two aspects: eligibility and authenticity. Aspects of eligibility generally include several criteria: knowledge coverage, insight aspiration, recency, exposure, analysis and synthesis of scientific work, contribution for advancement of science and technology. Existing flow of validation process in Udayana University can be seen in Figure 1.

IV. System Design

At this stage, the system will be built and installed within the single web server. The main objective is to focus on the process of realizing the scientific work validation system. To support the implementation of this first phase, the research is divided into several sub-phases.

A. Requirement analysis

Elicitation of system requirements is done in this stage. In order to achieve that, the results of the preliminary study are evaluated and the validation process is further studied. Related parties are also interviewed, including the agency who is responsible for coordinating the process of scientific work validation (BPMU).

All possible processes and procedures that have been identified are confirmed and checked for its correctness with BPMU. Identification of functional and non-functional requirements of the system is based on interviews and studies that have been done before. The functional and non-functional requirements of the system are then used as the basis for determining the modules and features of the system. It also serves as a guide in the design process OF both the platforms that will be used later as well as application development framework and its software architecture.

B. Architecture design

At this stage, we will conduct software architectural design based on the functional and non-functional requirements that have been defined in the previous stage. In the first year, the research will be focused on the development of minimal features that the system must meet (functional requirements). Thus, the system functional requirements will be prioritized, but we will still provide room for customization to meet the non-functional requirements of the system such as system access speed and the level of safety and the possibility of other non-functional requirements.

The tools and technologies to develop the software will also be selected as well as the language to be used (web-based system using CodeIgniter framework and object-oriented programming). For the first phase, an overview of the system design of scientific work validation can be seen in Figure 2.

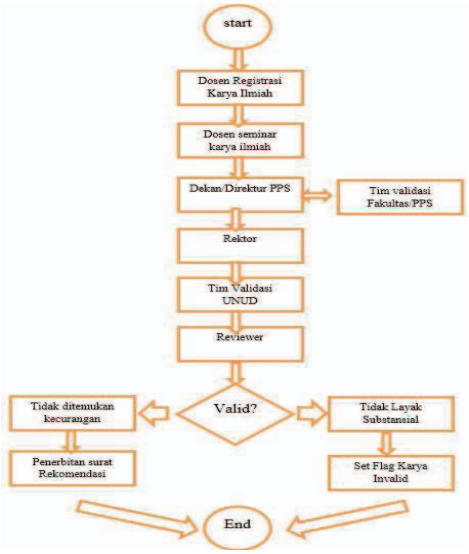

Fig. 2. Validation Flowchart

C. Implementation

With the completion of the design of the software to be developed, then the next phase is implementation. The implementation process will be carried out following software development standards (Coding Style Convention), so that the software code is more manageable later. In addition, the programming process will also use version control to manage changes of the code. Using version control will ensure that we have history of changes made to the code.

D. Testing and Evaluation

To ensure that the features implemented will run smoothly, it needs to be tested. Experiments carried out by testing must-have features one by one (black box). In addition, testing will also carried out by using scenarios that have been previously defined. The scenarios represent real life environment where the application will be used. Testing results will then be evaluated and improved and can also be collected and used as considerations for the next development iteration process.

E. Results and Discussion

1) Requirements analysis

At this stage, the system requirements analysis is conducted by interviewing the users, in this case BPMU and reviewers.

a) Functional requirements

The functional requirements are 1) the system must be web based, 2) the ability to delegate a reviewer for a scientific work, 3) online grading for reviewers, 4) lecturers are able to upload his papers online. The system is expected to perform basic database functions such as Create, Read, Update, Delete (CRUD) on research type. The types of research are Dosen Muda, Hibah Udayana, Kajian Wanita, Hibah Bersaing, Hibah Pascasarjana, Hibah Pekerti, Hibah Kompetensi, Insentif Dasar, Hibah Strategis Nasinoal, Fundamental, and Hibah Kerjasama. The system is also expected to perform data management on type of publication, publication's category (local, national, or international). System can record the number of authors in a scientific work. It also has to keep track of comments history for each scientific work. The system is able to perform an assessment of the scientific work.

b) Non-functional requirements

The system is able to perform news, announcements and guidelines management. A survey to reviewers is also conducted in this stage. The survey is carried out to find a review model that can improve the comfort of the reviewer in conducting the review process.

2) System design and implementation

a) System flow

Once we obtained the functional and non-functional requirements of the system, the next step is to design the system flow. The flow of the scientific work validation system can be seen in Figure 2.

b) Entity relationships diagram (ERD)\

Entities involved in the scientific work validation system are lecturers, scientific works, reviewers and validators. The ERD of the system is shown in Figure 3.

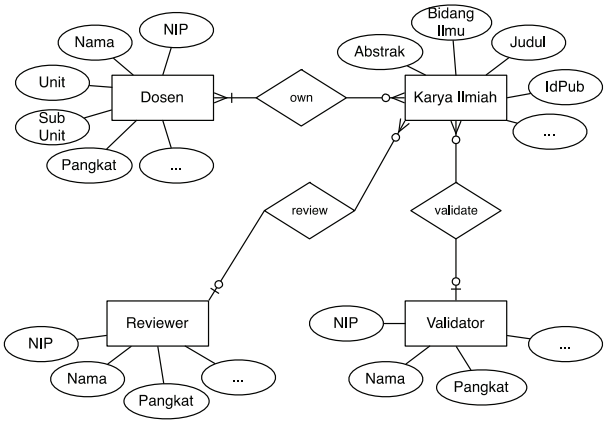

Fig. 3. Overview of ERD System

3) System features

There are four main roles in the systems: operator, lecturer, administrator and reviewers. Each of these roles needs specific features and they are shown in Figure 4, Figure 5 and Figure 6.

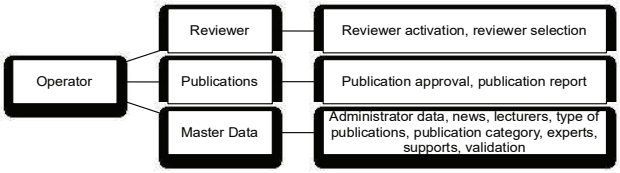

Fig. 4. Operator functionalities

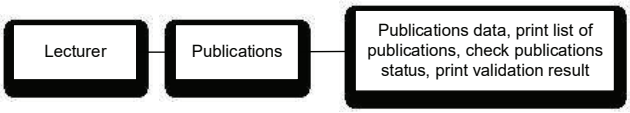

Fig. 5. Lecturer's functionalities

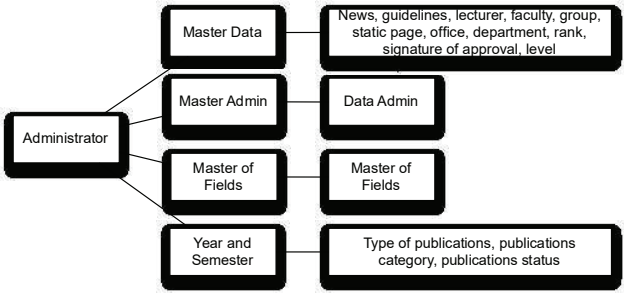

Fig. 6. Administrator's functionalities

The system is not only used by those who competent in computer and information technology, but also those who are competent in other fields. This became the basis of the interface model that is carefully designed in order for the navigation and control menu to be understood easily.

Figure 7 shows an example of the menu interface. This menu is used to select reviewer. The validation system has been tested using black box method. Black box analysis is carried out on all functionalities of each user category. Results of the black box testing indicate that the entire system has functioned properly. This proves that the system can perform all required functions.

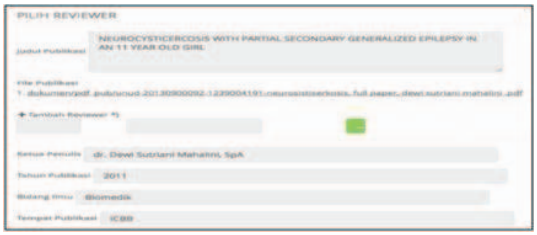

Fig. 7. Reviewer selection interface

F. Conclusion

The conclusions obtained from the research are:

a. There are two main requirements of the system: BPMU as the organizers of the validation process and reviewers want the validation process to be simple.

b. Scientific work validation system developed in this research has functioned properly and met the requirements of scientific work validation at the Udayana University. This can be seen from the result analysis of testing the system's features.

c. The system is able to improve BPMU's performance in terms of efficiency and effectiveness as a quality improvement media in Udayana University.

G. References

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