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DAFTAR ISI

IMPLEMENTING COLLABORATIVE DOCUMENT MANAGEMENT SYSTEM IN HIGHER EDUCATION ENVIRONMENT

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ABSTRACT

The need of integrated data gathering in an institution often become a forgotten problem. However, this requirement should be implemented carefully depending on the institution need. For that reason, there should be a specific information system that will hold whole data in the institution as an integrated data from every department and it also must handle all synchronization process. The most appropriate and fastest solution for this problem is creating a collaborative document management system. First step in this research is analyzing the system requirements and also identifying available resources. And in its implementation, even though technically succeeded, however, it also meets constraint from user's behavior. As this collaborative document management system already being implemented as web based application, it still need some future development in order to make the system more useful for the institution.

Keywords : *Collaborative, Higher Education, Document Management System*

1. Introduction

The need of integrated data gathering in an institution often become a forgotten problem. However, this requirement should be implemented carefully depending on the institution need. Especially in an higher education environment in Indonesia, which periodically doing accreditation process. Whenever this process is being done, then it going to be a busy time for every person in university to gather and synchronize data for each departments which are involved. Thus, it really need a centralized and well organized data in order to create reliable output.

In unifying data process, it always need a good corporate portal server to handle all the data. Some great proprietary softwares has already provide that kind of features, yet, it will cost expensive price that not every university (especially in Indonesia) can afford to buy it. Also, accreditation process of university in Indonesia is not a common process. Since that it always need "special treatment" for the data in order to become a meaningful information for its form fillin process.

For that reason, there should be a specific information system that will hold whole data in the institution as an integrated data from every department and it also must handle all synchronization process. Other problem is that the system should have been done in very efficient way and being implemented as fast as it can. And remembering that most of data processing will be loaded from many sides of department, thus it ought to split the workload efficiently.

When the data has already provided by many departments in different format such as Microsoft Word documents, Microsoft Excel documents or come in PDF format, they must reside in single storage and alos link recursively among many study programs, faculties and also other units. Thus, the other constraint which come from this problem is how to make it all documents become more comfortable in searching and also collaborate them all into single system.

While implementing a collaborative system software often called as groupware, its function is not merely synchronizing the result of collaboration, but it also can support decision in that collaborative group (Hilmer & Dennis, 2001).It also already empirically proven as efficient way in order to achieve integrared information(Rutkowski, et al., 2002).

However, a collaborative system should be tailorable to fit the requirement dynamically evolving and differentiated fields of application. Tailorability in an collaborative system is a must since that the level of expertise in an organization is always different for each person (Wulf, 1999). It means that we ought to build our own groupware in order to achieve the purpose and solve the problem which occur.

Therefore, in this case especially in higher education environment context, the need of building a specific collaborative system which featuring document management system as its main purpose is very important. Thus, it is become undoubtable that system implementation should become helpful for the university..

2. Modeling

The implementation of this system use web based development, since that the main purpose of this system is mainly gained a simple yet efficient collaborative document management system. In this case, we use .NET framework which implement Visual Basic .NET programming language in ASP .NET (Hilmer & Dennis, 2001)in future development using ASP .NET. The other reason is because the server which are already available is using Windows Server, thus it would be faster when we implement it using something which already available in .NET Framework.

First step in this research is analyzing the system requirements and also identifying available resources. Remembering that the main purpose of this system is doing collaborative integration and also must be done as quickly as possible, thus the result should be utilizing all the resources which already exist. Thus, it means that the system must have a global function that can connect all available resources and pull it to the newly integrated system.

When a global function needed, then it should be implemented using XML Web Service which is already proven as most efficient way in integrating such case (Wicaksono, 2010). The XML Web Service then being placed in faculty web server thus it can integrated older data from the existing systems. On the other hand, the new system also accept additional data from the accreditation team and also its supporting team members such as, head of faculty and lecturers from faculty which support accreditation team from faculty point of view. Thus, the system main task which must synchronized all the data and also dynamically getting the most updated data from other systems.

While the system being built use synchronous method in collaborative system, thus it means that users allowed to work on project simultaneously . This happens when a user trying to update the data in existing system, it also can affect the data in newly build system. And in the same time, users who works in new system can also update data in the same project or same category.

In order to clearly understand the system, let see the architecture diagram in following figure :

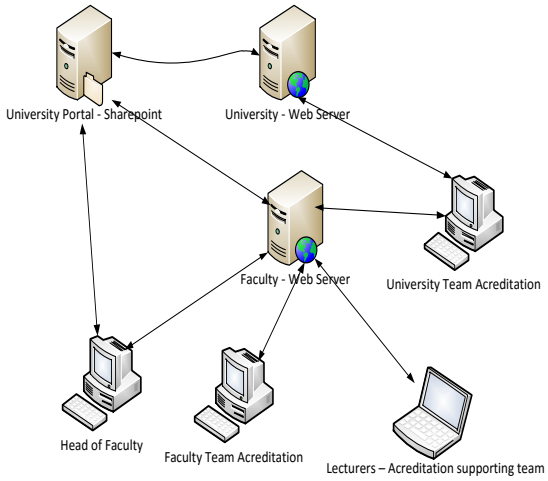

Figure 1. Architecture Diagram

This type of collaboration should bring the concept of virtual organization which can decrease the need of physical meeting and also it can bring more honesty in collaborative process (Davoli, et al., 2009). Thus, all of the document's deficiency problems can be handled faster because there would be no hidden object from any units or study program in this case.

After the verification process completed, then team trying to categorize the complete verificated documents and provide it to all supporting member in order to have their feedbacks. The last step is when IT department as the owner of two existing system providing its XML Web Services to synchronize all of the documents thus it would be ready for next collaborative process in accreditation process. To know more and have clearer picture from this analysis, let see the following use case figure :

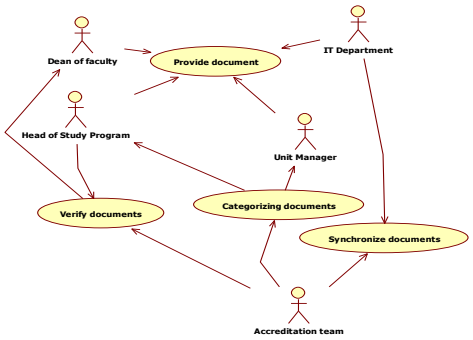

Figure 2. Use Case Diagram

3. Results and Analysis

In real implementation from this collaborative system, merely tested in a study program not in entire university. This happens just because it still need some adjustment in the system and also it needs to modify user's behaviour before using this system completely.

The modification in user's behaviour while using collaborative system is important because it is the main constraint in implementing such system. Many persons who involve in collaborative system commonly have a "free riders" behaviour or user who use the information providing by others without contributing evaluations from their own (Davoli, et al., 2009).

Solving this problem, is quite easy yet also difficult. Since that it needs support from higher level of management to encourage that collaborative system not only can reduced time in completing accreditation process, but it can also boost productivity and impact customer's satisfactio three times. However, this encouragement process needs time, that's why the implementation process merely done in a single study program not in entire university.

The result of implementation of this system, as use case diagram has already described, can be viewed by many actor point of view. While a single person can act as many actors such as head of study program and also can be a member of accreditation team. Thus, it must be split into distinct user level in order to emphasizewhich part of document for him to provide.

Afterward, the accreditation team must collaborate with head of study program to verify documents and then categorizing them in proper format. This process can be done simultaneously in different places at a time. Since that the system is built using web based application, thus there is no fear that the categorization process goes wrong while other users doing the same process. Also, all the team members can view what has already being uploaded by others, thus it can minimizing human error and reducing redundancy in synchronization.

Figure 3. Web Page for Viewing Documents based on each level

In order to support documents creation rather than merely uploading the existing documents, this website also provide feature for user to create some supporting documents for accreditation process. The following figure show an example of how a user (especially lecturer) can provide teaching guide in order to support accreditation process.

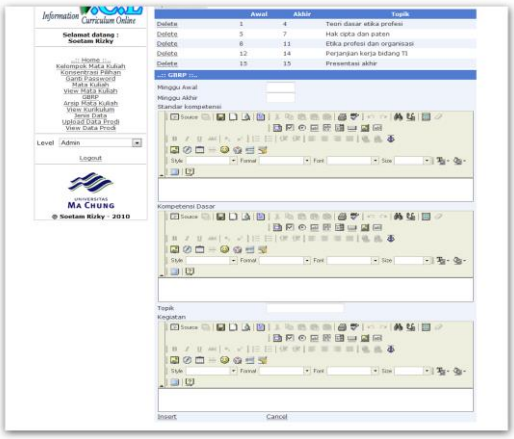

Figure 4. Sample of document creation page

At last, as a final result for this system, as mentioned previously, the collaborative documents result can be accessed easily and more convenient for accreditation team member in order to fasten the borang filling process. All of the documents which already being verified and also categorized using accreditation standard can easily downloaded and printed by the team members, thus it can produce efficient workload and increase productivity as its purpose. The following two figures show how the accreditation team can access the result from the system.

4. Conclusion

After modeling and developing process finished for the application, there are some conclusions that can be drawn, which are: (1) technically, the implementation of collaborative document system is not too difficult, yet it need a great effort in analysis process. Since that system requirement need to be recognized from many point of view, (2) implementation of collaborative system meets a big constraint which come from user's behaviour which theoritically named as "free rider". However, this constraint can be tackled by involving high level management commitment to encourage all

the team member to actively contribute to the system, (3) empirically, the collaborative system has been proven very helpful in finishing accreditation process.

In its future development, this system need some improvements which are : (1) collaborative system should be develop as private cloud computing or storage virtualization thus all the existing system can be more efficient in its storage space, and (2) it also should be developed to a decision support system in order to support accreditation visit moment, thus it would not merely to store the data, but also can make a smart answer whenever it needed.

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