KnE Engineering

JICOMS
Jakarta International Conference on Multidisciplinary Studies towards Creative Industries
Volume 2024

Knowledge E
enriching | engaging | empowering

Research Article

Enhancing Accreditation Processes in Polytechnic of Media Kreatif Through Cloud-based Academic Data Collection and Analysis

Sanjaya Pinem[1]*, Nova Darmanto[2], Anju Bherna. D. Nainggolan[2]

[1]Politeknik Negeri Media Kreatif, Jakarta, Indonesia
[2]Universitas Efarina, North Sumatera, Indonesia

ORCID
Sanjaya Pinem: https://orcid.org/0000-0003-0517-3106

Abstract.
Data retention plays a crucial role in the accreditation process of an on-campus program of study. Since 2012, Polytechnic of Media Kreatif has been engaged in the implementation of accreditation procedures. However, the effectiveness of these procedures is hindered by the decentralized storage of data, resulting in disruptions throughout the data-gathering process. Consequently, stakeholders have difficulties in their efforts to evaluate and accredit study programs, as they are required to manually look through individual files and data. This research anticipates that the deployment of centralized data storage for certification purposes will alleviate the challenges previously associated with this process. The agile method was used to develop the systems. In conclusion, this study found that the applications that have been created to help with the management of accreditation-related data were supported by a well-running black-box test. It is also backed by an average usability test of 74%.

Keywords: cloud storage, data management, agile method

Corresponding Author: Sanjaya Pinem; email: pinemsanjaya@gmail.com

Published 7 March 2024

Publishing services provided by Knowledge E

Selection and Peer-review under the responsibility of the JICOMS Conference Committee.

1. Introduction

Cloud storage has become increasingly popular as a means of storing and accessing data in various industries. Specifically, cloud computing has been widely utilized in e-commerce, enterprise management, and information security[1]. It provides information sharing and business collaboration for e-commerce, reduces operating costs for enterprises, and ensures the security of data transmission and storage. Cloud storage has also shown promise in the field of assessment and accreditation. Accreditation is a process that evaluates the quality and standards of education institutions or programs. Cloud storage can be used as an application to streamline and enhance the assessment process in accreditation.

State Polytechnic Creative Media has been engaged in the accreditation process for both institutional accreditation and program accreditation since 2014. The utilization of observation methodologies has revealed that authorized results, which represent the highest level of achievement within a study program, have not been universally observed throughout all study programs within the State Technical Creative Media institution. This is evidenced by the lack of emphasis placed on the collection of data and documentation pertaining to accreditation throughout both middle and higher management[2].

Given its central location in the nation's capital, the college's involvement in the accrediting process should be regarded as a crucial aspect and a matter of the highest priority. Taking advantage of cloud computing and cloud storage offers significant benefits that contribute to the seamless execution of the accreditation procedure[3]. Cloud storage make it easier for users to access the data needed and will be useful in disaster mitigation as a form of data backup.

2. Material and Methods

2.1. Method

In order to build an application for cloud storage that can assist in the assessment process for accreditation, the agile methodology can be effectively utilized. This approach enables agile teams to work collaboratively and respond quickly to changes in requirements[4], [5]. Furthermore, agile methodologies promote active involvement and collaboration between developers and stakeholders throughout the development process.

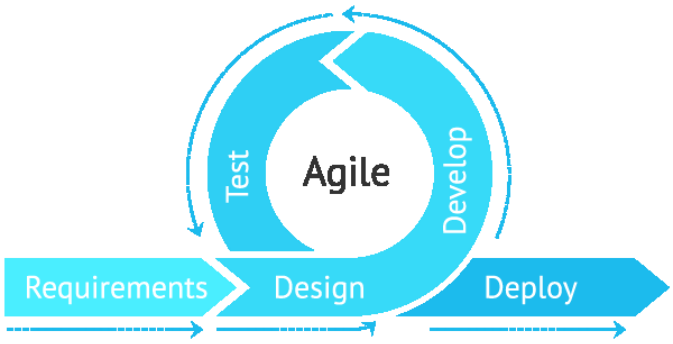

Figure 1: Agile Method.

The Agile methodology is a software development approach that prioritizes incremental and iterative development. It emphasizes collaboration among cross-functional teams

and allows for flexibility throughout the software development process. 1). Requirements encompass specific functionalities, features, and constraints that must be met to meet user needs.2). Design involves planning and creating the overall structure, interface, and architecture of the software application.3). Development entails coding the software application based on requirements and design specifications.4). Testing systematically evaluates the functionality of an application to ensure it meets specified requirements. Lastly, 5). deployment involves installing or hosting a software application for use by end-users[6].

2.2. Requirements Phase

All of the requirements for completing this cloud-based storage application were established at the outset so that the application could be completed according to a predetermined schedule.

TABLE 1: Requirement Phase.

No	Activity	Functional Requirement
1	Managing Accreditation Data	System possesses the ability to add, modify and delete the information of Data
2	Managing Criteria's	System possesses the ability to add, modift, and delete the information of Criteria's
3	Managing URLs	System possesses the ability to add, modify, and delete the information of URLs

2.2.1. Non-functional requirements are reliant to the fulfilment of functional requirements; these requirements are interconnected in such a way that the intended system can function effectively. Considering the non-functional requirements present in the built-in system, they can possibly be listed as follows:

2.3. Design Phase

During this phase, the functional requirements undergo a process of transformation into a model referred to as UML (Unified Modelling Language). The UML diagram should conform to all functional criteria that have been previously established. The UML diagram is depicted in the accompanying image.

TABLE 2: Non-Functional Requirements.

No	Hardware Requirement	Software Requirement
1	Computer with i5 CPU	Server with minimum 1CPU
	Minimum ram of 4GB	PHP Package with Codeigniter Framework
	Minimum Hardiskspace 80GB	Putty/SSH
		Lamp Stack
		Network with minimum 1Gbps

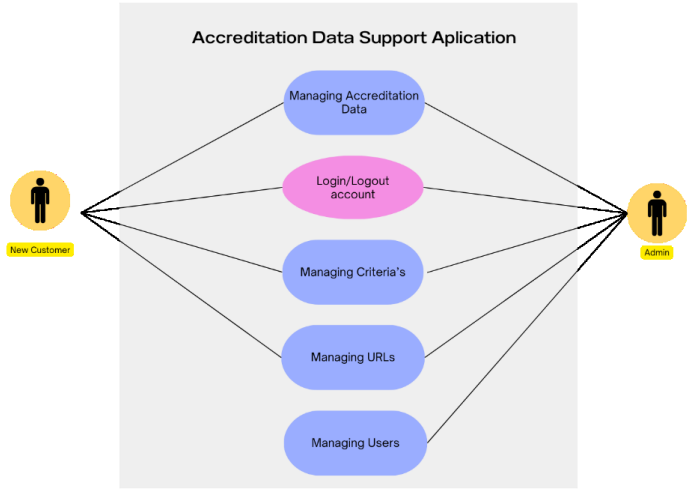

Figure 2: Use Case with UML.

Following the description of the use case, the subsequent phase involves the development of an activity diagram including all the formulated use cases. The primary objective of an activity diagram is to provide a comprehensive documentation of the many business processes that occur within a given system. Ensuring a consistent understanding and implementation of processes can be significant.

In the event that the login ID and password combination provided by the user are accurate, access to the primary dashboard will be granted. However, if either the login ID or password is erroneous, the dashboard will not be accessible, and the user will be directed to input an appropriate login ID and password.

Moreover, within the context of accreditation data administration, users possess the capability to both add and modify the provided accreditation data. Refer to the corresponding image for activity diagrams

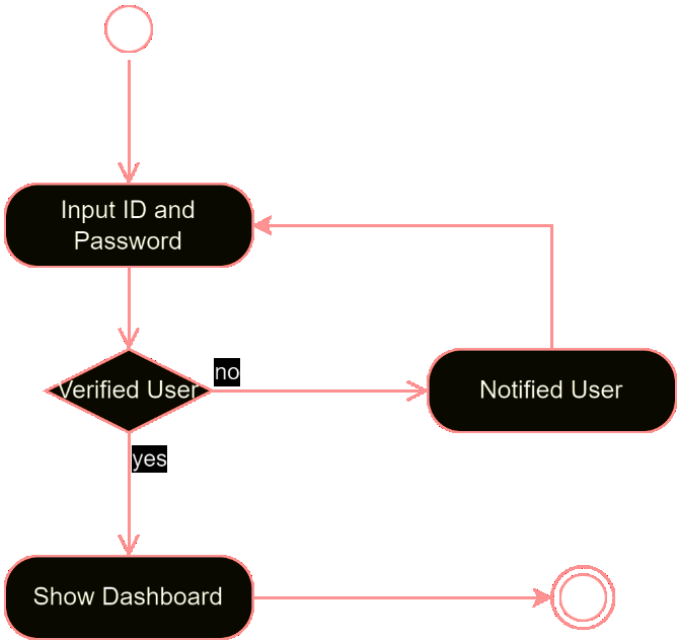

Figure 3: Activity Diagram Login.

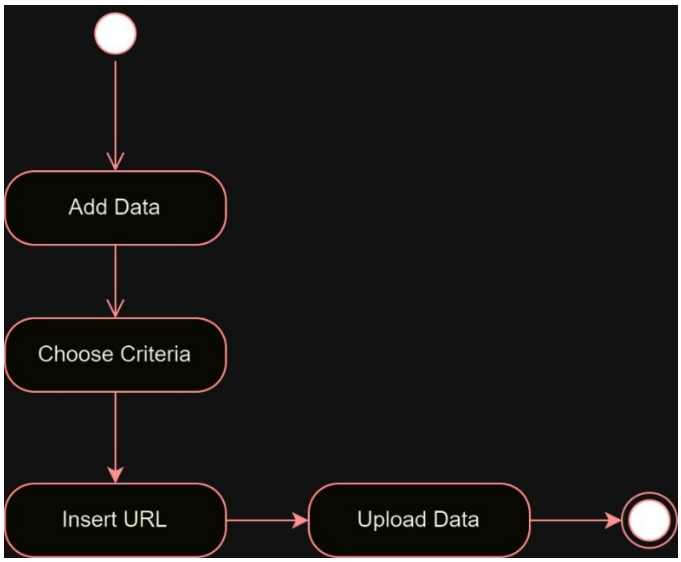

Figure 4: Activity Diagram Add Data.

3. Result and Discussion

Within this particular section, the process of development and implementation takes place, where the previously defined design and requirements of the application are transformed into coding and later on implemented on the server. The outcomes that have been generated will be assessed throughout the testing phase through black box testing[7].

3.1. Login Form

In this particular format, the user will input the previously designated identification number and password using the login credentials of the administrator. The utilization of the accreditation data that needs to be uploaded located on the primary dashboard page.

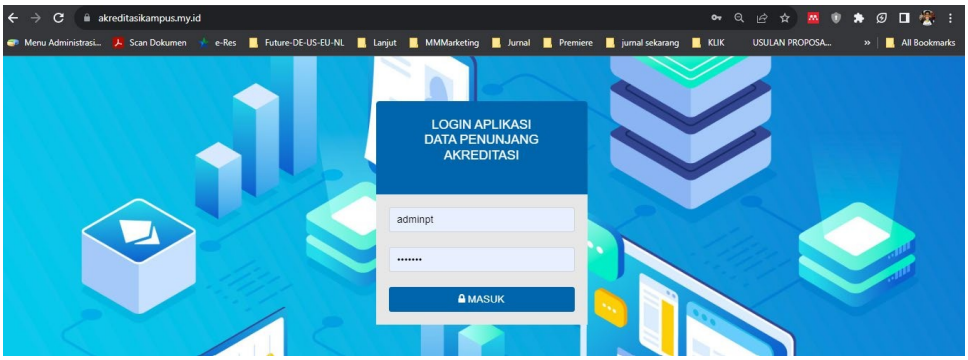

Figure 5: Login Form.

3.2. Add User

At the administrative level, several functions are not available to regular users. Users can be added by administrators based on the study program utilized as a database. The files related with the accreditation can be downloaded directly by registered users.

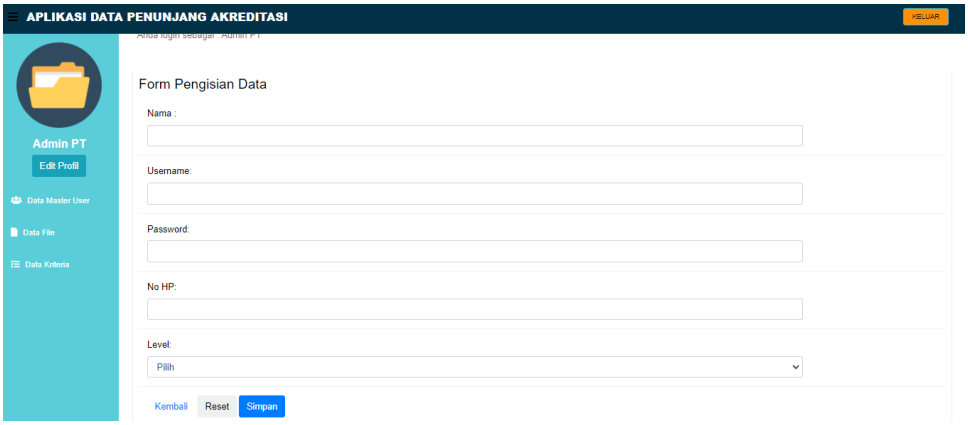

Figure 6: Add Users.

3.3. Add Accreditation Data

The primary characteristic present in the cloud-based accreditation data storage application is the integration of data gathering associated with accreditations. The implementation of a systematically structured file grouping function will allow the efficient retrieve of the required documents by assessors. The inclusion of a URL capability facilitates easy navigation to the requested file.

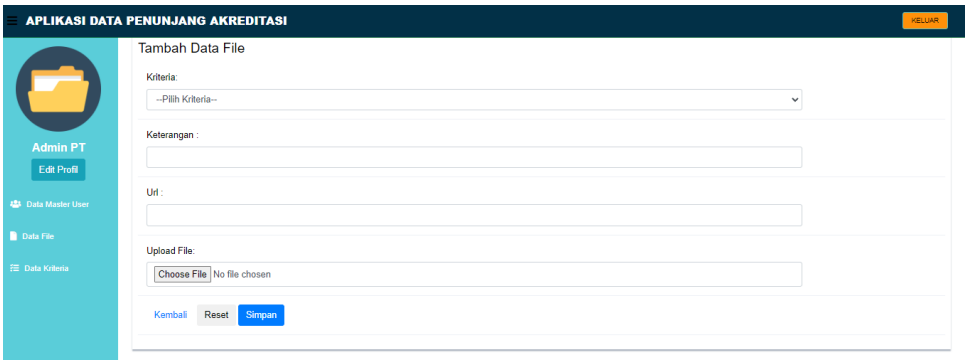

Figure 7: Upload Accreditation Data.

The integrated functions are subsequently subjected to blackbox testing, wherein the intended design specifications are executed at another stage. In regards to black-box testing, the focus relies solely on the functional aspects that are identified during the essential analysis step.

TABLE 3: Black-box Testing.

No	Process	Detail	Purpose	Result
1	Administrator and user can login	Username and password inserted then click login button	System can recognized combination user and password and go to dashboard	correct
2	Administrator and user can manage accreditation data	Administrator and user click the add data button, inserted the form and can update, edit also delete the data	System will process a specific process which it can be add, update, and deleted the data.	correct
3	Administrator can manage the users	Administrator click the add user button, inserted the form and can update, edit also delete the user	System will process a specific process which it can be add, update, and deleted the user.	correct

In the context of usability testing, a Likert scale is employed, containing multiple criteria. User feedback plays a crucial role in assessing and informing the development of future applications. Feedback include inquiries that encompass the dimensions of

learnability, operability, understandability, and attractiveness. The rating criteria cover four categories: very good, good, enough, and less, with corresponding maximum scores of 100%, 84%, 64%, and 54% respectively. The findings gathered during the usability testing are displayed in the following image.

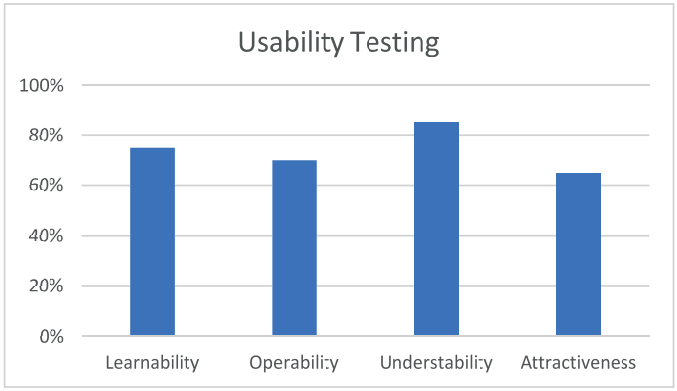

Figure 8: Usability Testing.

The results of the usability testing revealed that the learnability component scored 75%, operability scored 65%, understandability scored 85%, and attractiveness scored 65%. In general, the mean score for the usability test was 74%, indicating a classification of “good.”

4. Conculsion

The effective completion of the development of cloud computing-based apps for data storage with accreditation has been achieved. The application has successfully fulfilled all the functional and usability criteria. Based on the findings of the usability testing, it is seen that the learnability dimension of the system achieved a score of 75%, while the operability dimension attained a score of 65%. Furthermore, the system’s understandability dimension was rated at 85%, and its attractiveness dimension received a score of 65. In general, the typical usability test yields a score of 74%, placing it within the “good” range.

In our capacity as researchers, we propose recommendations related to the current field of study. Specifically, for future investigations, we suggest incorporating data search functionalities and notification capabilities, while also enhancing the design to be more visually appealing and responsive.

Acknowledgements

Thanks to Center for Research and Community Service (P3M) Politeknik Negeri Media Kreatif.

References

[1] Nasution T. OPTIMALISASI CLOUD STORAGE UNTUK AKSESBILITAS DATA IMAGE PADA MOBILE APPS DI STMIK AMIK RIAU [Journal Of Information Systems And Informatics Engineering]. JOISIE. 2020;4(1):29–35.

[2] Ntim KK, Fombad M. A model for open access institutional repositories usage for university libraries in Ghana. Inf Dev. 2021 Nov;37(4):579–96.

[3] Mansouri Y, Toosi AN, Buyya R. Data storage management in cloud environments: Taxonomy, survey, and future directions. ACM Comput Surv. 2017;50(6):1–51.

[4] Akbar R. "Tailoring Agile-Based Software Development Processes," *IEEE Access*. Volume 7. Institute of Electrical and Electronics Engineers Inc.; 2019. p. 139852–69.

[5] Moniruzzaman AB, Hossain DS. "Comparative Study on Agile software development methodologies," no. May 2014, 2013, [Online]. Available: http://arxiv.org/abs/1307.3356

[6] Sherif E, Helmy W, Galal-Edeen GH. Managing Non-functional Requirements in Agile Software Development. 2022. pp. 205–16.

[7] "Software Testing with the approach of Blackbox Testing on the Academic Information System," *IJISTECH (International Journal of Information System & Technology)*, vol. 3, no. 2, pp. 227–233, 2020.