Journal of Artificial Intelligence and Engineering Applications

Website: https://ioinformatic.org/

15th October 2025. Vol. 5. No. 1; e-ISSN: 2808-4519

Design of a Web-Based Credit Score Assessment System (Case Study: STMIK TIME) Using the Rapid Application Development Method

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Abstract

Higher education institutions have an important responsibility to provide quality educational services in order to achieve student satisfaction. However, various challenges are still encountered, particularly in academic administrative services and the availability of facilities and infrastructure. As visionary institutions, universities are required to continuously innovate and adopt leadership strategies that are adaptive to global changes and local challenges.
STMIK TIME, as one of the higher education institutions in the field of information technology, has study programs that require an objective and structured lecturer performance assessment system. Lecturers, as professional educators, are expected to demonstrate optimal performance influenced by motivation, competence, leadership, and work environment. In the context of academic rank promotion, credit score assessment (PAK) must be carried out consistently in accordance with established procedures.
Based on this background, this study aims to design a web-based lecturer credit score assessment system at STMIK TIME using the Rapid Application Development (RAD) method in order to accelerate the assessment process and improve academic administrative efficiency.

Keywords: *Credit Score Assessment, Lecturer, Information System, Web, Rapid Application Development (RAD)*

1. Background

Higher education institutions are educational entities that bear the responsibility of providing the best services in accordance with the needs and expectations of students. One of the indicators of educational quality can be seen in the competence of teaching staff and supporting personnel in delivering academic services. With quality educational services, student satisfaction is expected to be achieved. However, in reality, universities still face various issues that lead to student dissatisfaction. These problems are generally related to academic administrative services and the availability of facilities and infrastructure that are considered less than optimal [1].

As agents of change, visionary higher education institutions must be able to innovate and develop quality leadership strategies that are responsive to global dynamics, local challenges, and capable of projecting future directions [2]. One of the higher education institutions focused on the field of information and communication technology is STMIK TIME, located in Medan City [3]. A study program is an educational activity unit with a specific curriculum and learning methods, whether in academic, professional, or vocational education [4]. Lecturers, as professional educators, hold the primary responsibility of transferring, developing, and disseminating knowledge, technology, and the arts through teaching, research, and community service. To support the fulfillment of these responsibilities, lecturers are required to demonstrate good performance. Several factors influencing lecturer performance include high motivation, adequate competence, effective leadership, and a supportive work environment [5].

Although lecturers are expected to uphold strong integrity in line with academic values and professionalism, the process of credit score assessment for academic rank/promotion applications must still be carried out consistently and in accordance with the applicable procedures. This procedure aims to facilitate promotions for those eligible while providing sanctions for those who violate the rules [6].
Based on the above, the author is interested in raising the thesis topic entitled: “Design of a Web-Based Lecturer Credit Score Assessment System (Case Study: STMIK TIME) Using the Rapid Application Development Method.”

2. Literature Study

2.1. Credit Score Assessment

Higher Education Institutions (HEIs), as an integral part of the national education system, hold a strategic role in achieving educational objectives. Based on Law No. 12 of 2012 on Higher Education, Article 1 Paragraph 2, Higher Education is defined as the level of education following secondary education, which includes diploma, bachelor, master, doctoral, professional, and specialist programs, organized by universities with the foundation of Indonesian cultural values. Higher education institutions have several main functions, namely: (a) to develop capabilities and shape the character and civilization of the nation with dignity in an effort to educate the life of the nation; (b) to create an academic community that is innovative, creative, responsive, competitive, and collaborative through the implementation of the Tri Dharma of Higher Education; and (c) to advance science and technology while upholding and applying humanistic values [6].

2.2. Definition of Design

Design can be defined as the process of planning in the development of a system that includes various components to produce a system in accordance with the results of system analysis. Design is the initial step in the product or system engineering development phase. This process involves the application of various techniques and principles aimed at defining devices, processes, or systems in detail to enable their physical realization. In addition, design is also the process of creating and developing a new system. Based on experts' opinions, design can be concluded as the first step in planning a process to create and develop a new system [7].

2.3. Definition of System

A system is a series of two or more interrelated and interacting components working together to achieve a goal. A system can also be defined as a group of closely related elements that work together to achieve a specific objective. In another view, a system is a collection of elements, components, or variables that are organized, interactive, interdependent, and integrated [7].

2.4. Rapid Application Development Method

A study conducted by Entin Sutinah on the use of the Rapid Application Development (RAD) method in developing a Human Resource Fulfillment Information System at an outsourcing company showed that the developed application could serve as a solution for improving employee performance within the company. Based on the analysis carried out, the development of this information system produced significant results, such as improved efficiency in data processing, more effective HR data reporting, faster completion time, and higher data accuracy [8].
Another study by Oky Irnawati in 2018, entitled The Rapid Application Development (RAD) Method in Designing the Inventory Website of PT. Sarana Abadi Makmur Bersama (SAMB) Jakarta, explained that RAD is an incremental software development process model, particularly suitable for projects with short development cycles. Both studies show that RAD can accelerate the system development process and improve the quality of results in a more efficient time frame [9].
Research conducted by Dicky Hariyanto in 2021, entitled Implementation of the Rapid Application Development Method in a Library Information System, concluded that RAD was chosen as the software development method due to its advantages in producing a fast and high-quality system. The RAD method is very suitable for systems that are not too large or complex [10].

3. Method

In line with current technological developments, a system is needed to improve work efficiency and time management. The system in use until now is still manual; therefore, it must be replaced with a more effective one, namely by developing a computerized system. This system is designed to manage the credit score assessment of lecturers based on the Tri Dharma of Higher Education, which consists of teaching, community service, and research. The standards set within the Tri Dharma require each lecturer to conduct a maximum of 12 credit hours (SKS) of teaching per semester, one community service activity per semester, and one research activity per semester. The work is assessed over the course of one year, and the results of these activities will be input into the system.

To facilitate the procedures and data flow, a Data Flow Diagram (DFD) is designed. The DFD involves entities and system processes. The context diagram of the proposed application can be seen in Figure 1.

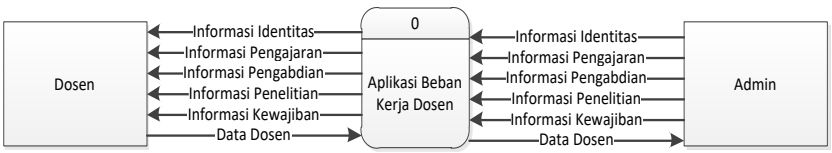

Fig. 1: Context Diagram of the Proposed System

The level zero diagram represents the Data Flow Diagram that illustrates the overall process. This diagram provides a general overview of the system being discussed, including the main functions or processes, data flows, and the external entities involved. The level zero diagram of this application can be seen in Figure 2.

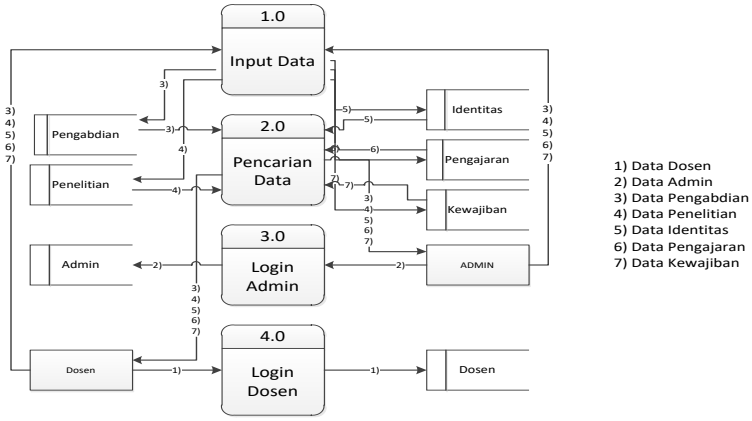

Fig. 2: Level 0 Diagram

The Level 0 Diagram consists of three processes: data input, data retrieval, admin login, and lecturer login. In the data input process, the admin provides identity data, teaching data, community service data, research data, and obligation data, which are forwarded to their respective databases (identity, teaching, community service, research, and obligations). In the data retrieval process, lecturers access identity, teaching, community service, research, and obligation data obtained from their respective databases. In the lecturer login process, lecturers enter login credentials that are validated against the lecturer database. In the admin login process, the admin enters login credentials that are validated against the admin database.

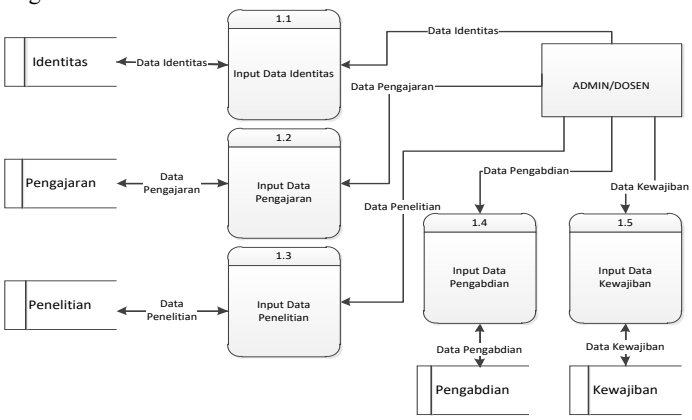

Fig. 3: Level 1 Diagram of Data Input Process

The Level 1 Diagram of the Data Input Process consists of five subprocesses: identity data input, teaching data input, research data input, community service data input, and obligation data input. In the identity data input process, the admin provides identity data that is forwarded to the identity database. In the teaching data input process, the admin provides teaching data that is forwarded to the teaching database. In the research data input process, the admin provides research data that is forwarded to the research database. In the community service data input process, the admin provides community service data that is forwarded to the community service database. In the obligation data input process, the admin provides obligation data that is forwarded to the obligation database.

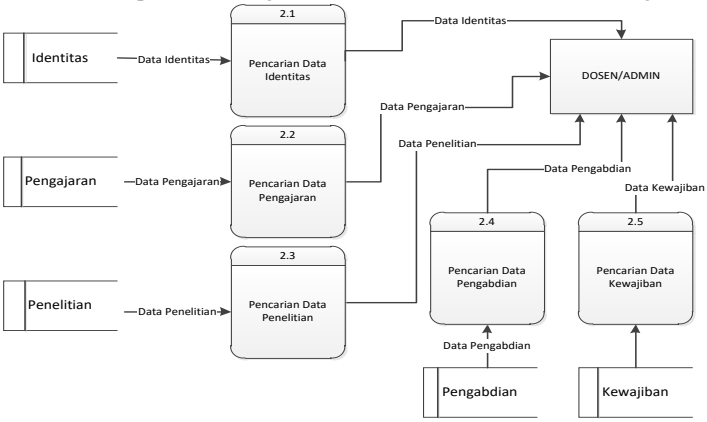

Fig. 4: Level 1 Diagram of Data Retrieval Process

The Level 1 Diagram of the Data Retrieval Process consists of five subprocesses: identity data retrieval, teaching data retrieval, research data retrieval, community service data retrieval, and obligation data retrieval. In the identity data retrieval process, lecturers receive identity data forwarded from the identity database. In the teaching data retrieval process, lecturers receive teaching data forwarded from the teaching database. In the research data retrieval process, lecturers receive research data forwarded from the research database. In the community service data retrieval process, lecturers receive community service data forwarded from the community service database. In the obligation data retrieval process, lecturers receive obligation data forwarded from the obligation database.

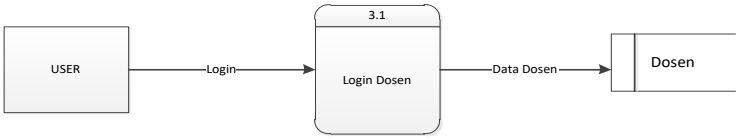

Fig. 5: Level 1 Diagram of Lecturer Login

The Level 1 Diagram of the Lecturer Login Process consists of one subprocess, namely the login process. In this process, lecturers provide login data that is forwarded to the lecturer database.

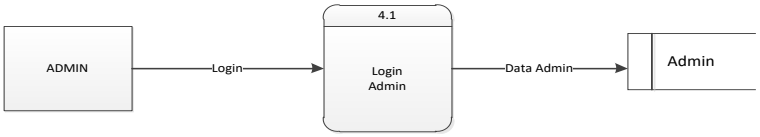

Fig. 6: Level 1 Diagram of Admin Login

The Level 1 Diagram of the Admin Login Process also consists of one subprocess, namely the login process. In this process, the user provides login data that is forwarded to the member (admin) database.

4. Result

In this section, the user interface of the repository website for lecturers and educational staff at STMIK TIME will be presented. The stakeholders who are entitled to use this application include:

1. Lecturers, as users responsible for calculating credit scores and submitting promotion proposals.
2. Assessors, as users who evaluate each supporting document uploaded by lecturers. Assessors are lecturers who are experts in a particular field and are competent to provide assessments.
3. Staff, as users responsible for issuing decrees (Surat Keputusan) once promotion proposals are completed and approved. Staff also play a role in determining which assessors will evaluate a lecturer.

4.1. Lecturer Page

Before accessing all activities in the system, lecturers must first log in by entering their NIP and password, then clicking the Login button.

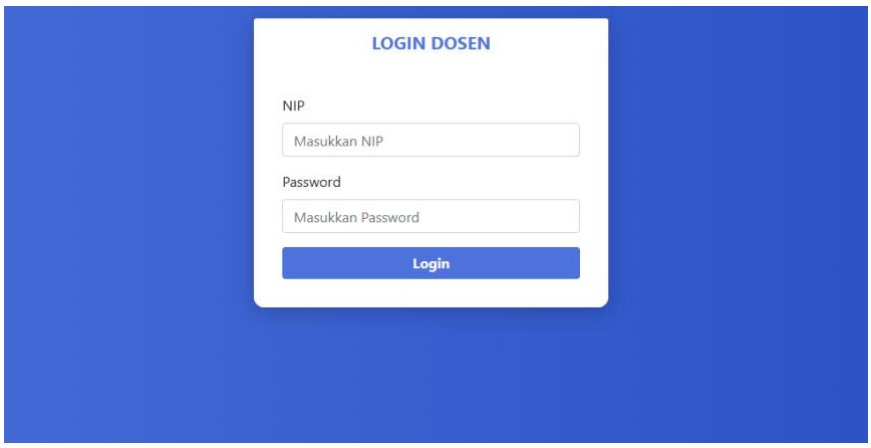

Fig. 7: Lecturer Login Page

Lecturers can perform the following activities within the credit score assessment system:
a. Submission
After logging in, lecturers click on Submission History to apply for promotion, then click Add Submission.

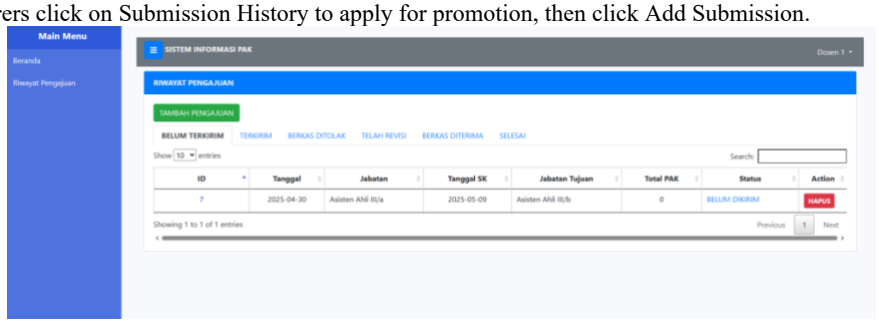

Fig. 8: Submission History Page

Next, complete the submission data. Supporting documents must be provided in the form of Google Drive links. After completing the required data, click Save Submission.

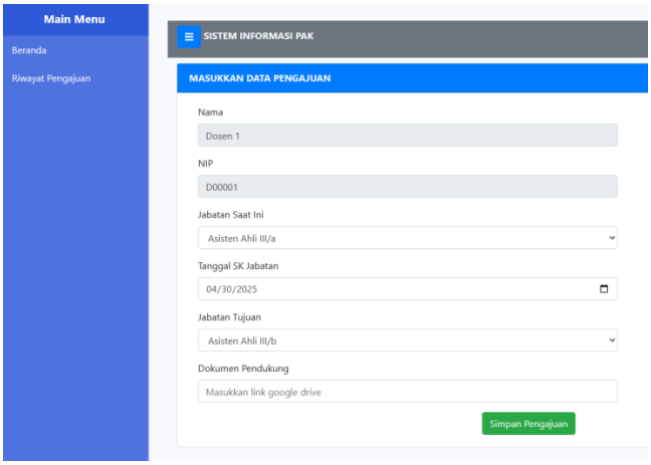

Fig 9: Add Submission History Page

After submitting, lecturers must upload promotion-related documents by clicking Add Document.

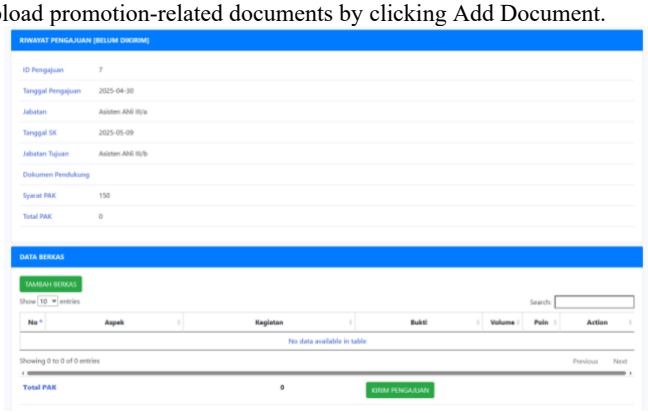

Fig. 10: Add Document Page

Select the relevant aspect and activity corresponding to the uploaded document to be stored in the system.

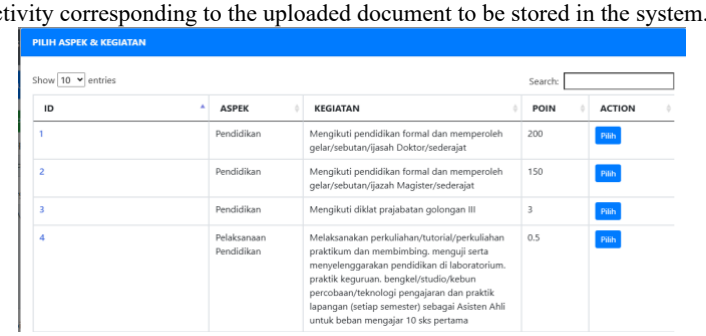

Fig. 11: Activity Selection Page

Enter supporting evidence in the form of a Google Drive link and specify the volume of the selected aspect and activity.

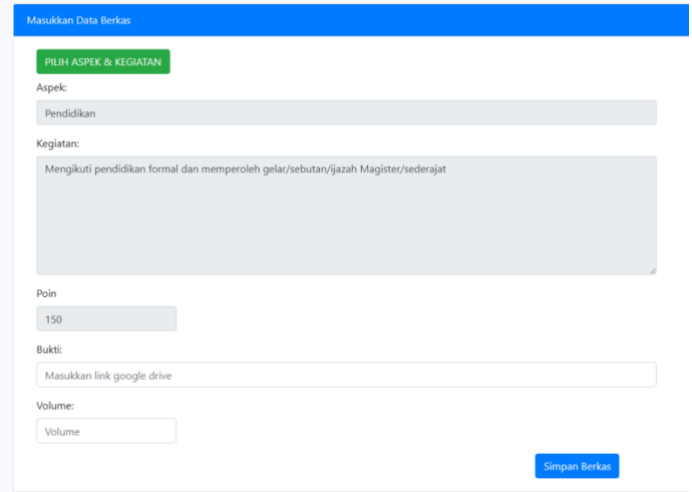

Fig 12: Document Input Page

Once the total credit score (PAK) meets the requirements, submit the application by clicking Submit Application.

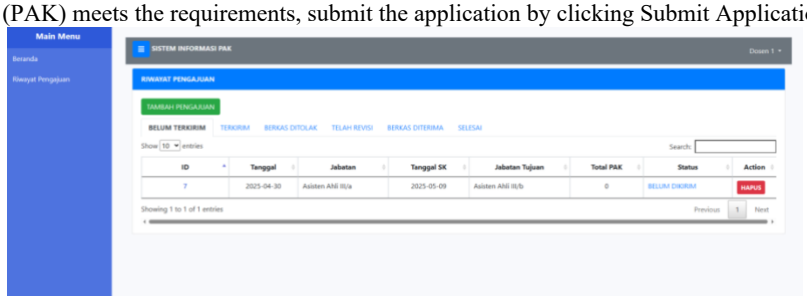

Fig. 13: Successful Submission Page

The submitted application will appear in the Submission History menu under the Sent sub-menu.

b. Application Results

The status of submitted applications can be viewed in the sub-menus under Submission History. For instance, rejected documents will appear under the Rejected Documents sub-menu. Users can revise by clicking on the Rejected Document in the status section.

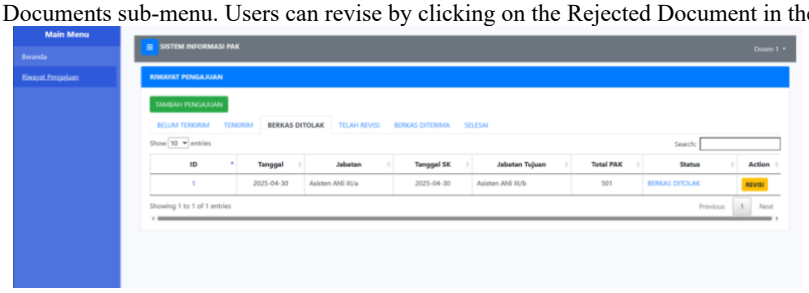

Fig 14: Rejected Application Page

If documents are accepted and evaluated, they will appear under the Completed sub-menu. To obtain the decree (SK) from the approved promotion application, click Accepted in the status section.

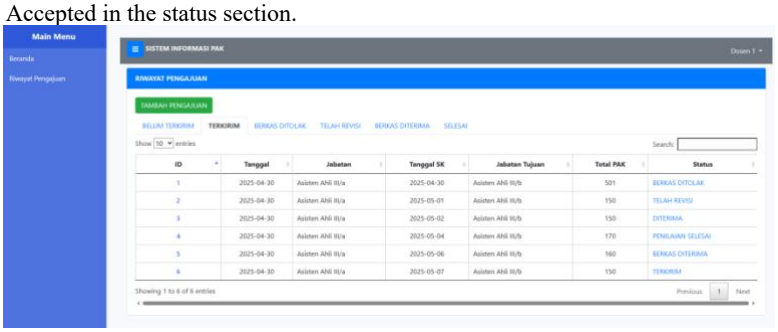

Fig. 15: Rejected Application Pages

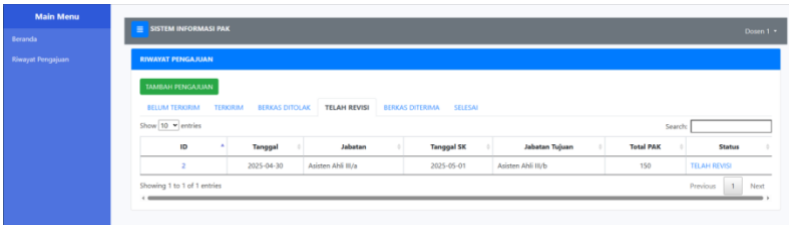

Fig. 16: Revised Application Pages

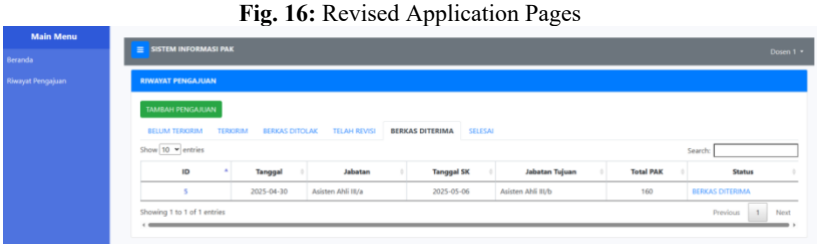

Fig. 17: Accepted Application Pages

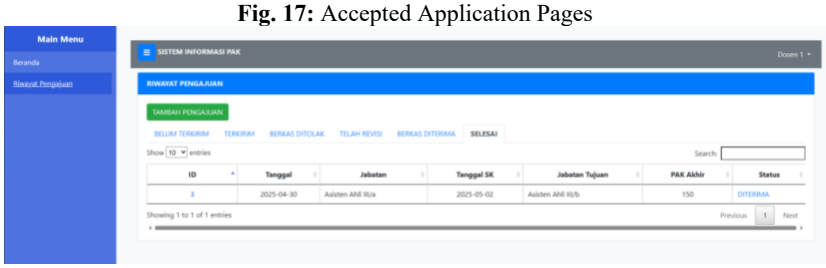

Fig. 18: Completed Application Pages

4.2. Staff Page

Before accessing all activities in the system, staff must first log in by entering their NIP and password, then clicking the Login button.

Fig. 19: Staff Login Page

a. Assessor Data Management

Assessor data management is used to add, delete, and edit assessor information for credit score assessments. Click the Assessor Data menu to manage assessors. To add an assessor, click Add Assessor.

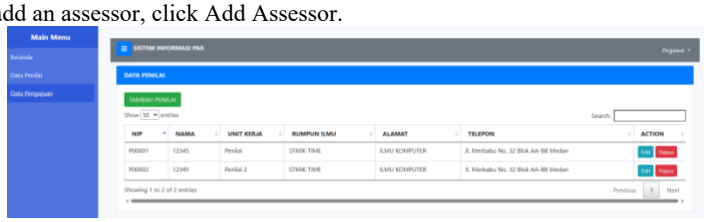

Fig. 20: Assessor List Page

Complete the assessor data and click Save.

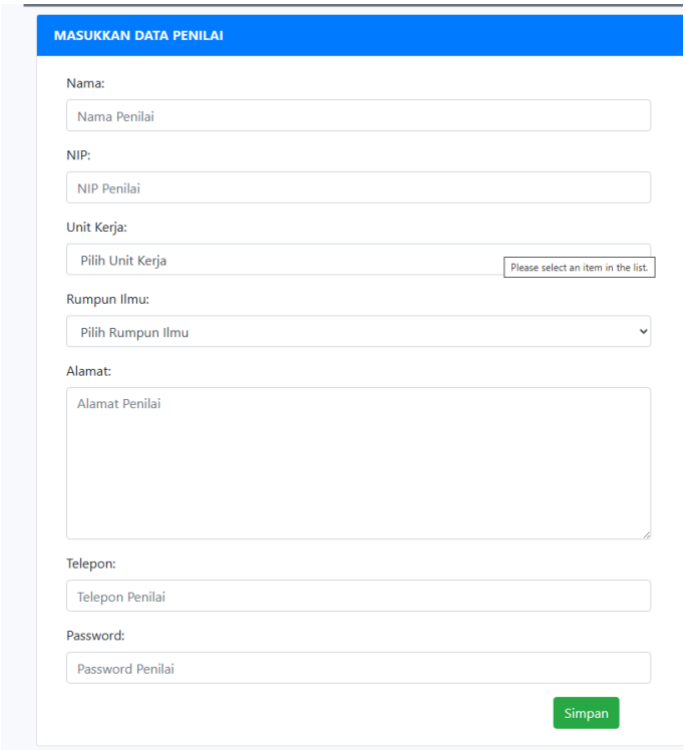

Fig. 21: Add Assessor Page

The saved data will appear in the assessor list.

b. Document Verification

Staff verify submitted documents before they can be evaluated by assessors. Click the Submission Data menu, then click Verify Document to check the submission.

Fig. 22: Document Verification Page

Supporting documents can be accessed by clicking the provided link in the Evidence column. Click Valid if the document is appropriate.

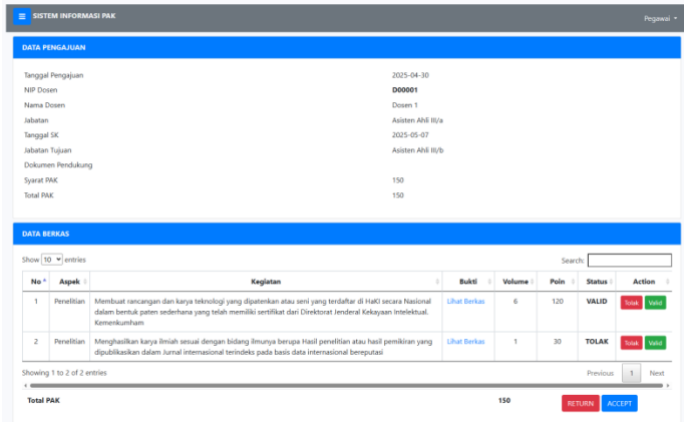

Fig. 23: Document Verification Update Page

Click Reject if the document is invalid and enter the correction notes, then click Save.

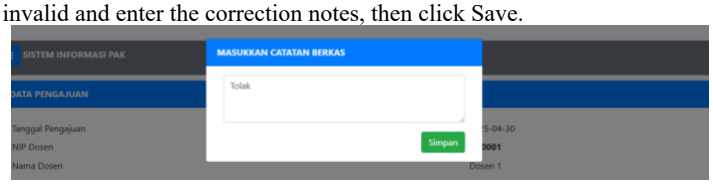

Fig. 24: Total Documents Page

After all documents are checked, click Accept if all data is valid, or click Return if one or more documents were rejected.

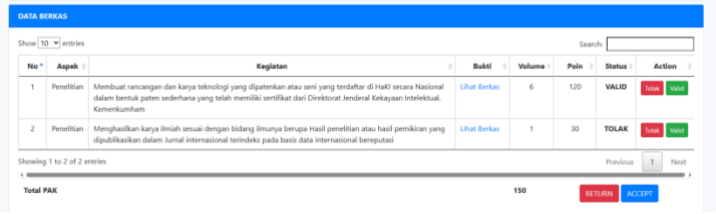

Fig. 25: Document Status Page

If the data passes verification, staff assign assessors for the promotion application. Select the first assessor by clicking Choose Assessor 1.

Fig. 26: Select Assessor 1 Page

A list of assessors will appear, and one can be chosen by clicking Select.

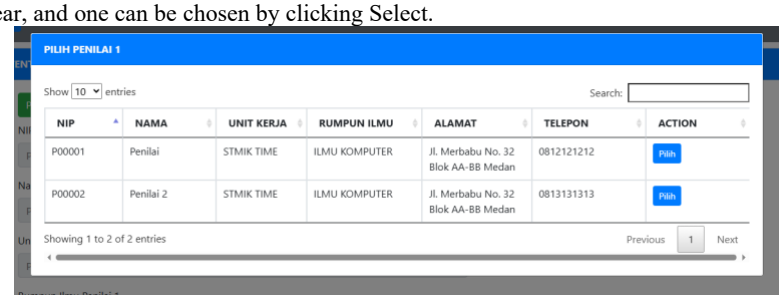

Fig 27: Assessor Selection Page

Repeat the same process to select a second assessor. After selecting Assessor 1 and Assessor 2, click Finish.

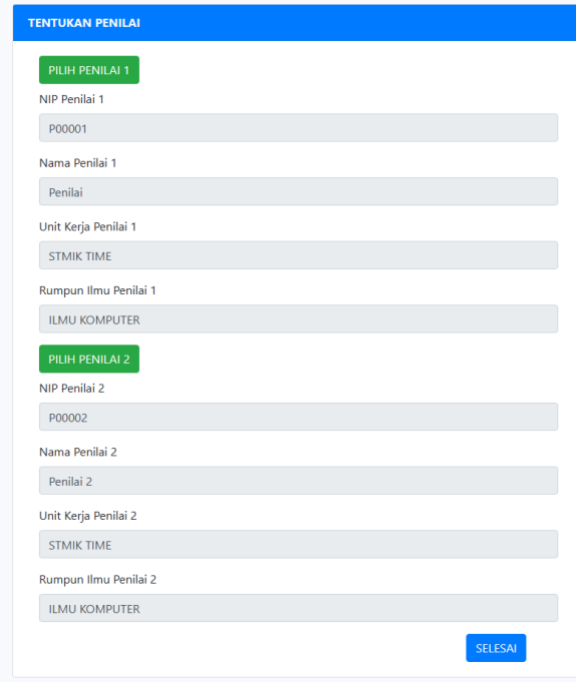

Fig. 28: Final Assessor Selection Page

The results will then appear under the Accepted Documents sub-menu.

Fig. 29: Accepted Documents Page

c. Approval

Documents that have been evaluated by assessors will appear in the Evaluated sub-menu. Staff provide final approval to accept or reject the application. Click Approval to proceed.

Fig. 30: Evaluated Documents Page

Click Reject Application to reject the submission or Accept Application to approve it. If approving, staff must upload the decree (SK) in the form of a Google Drive link so that lecturers can easily download it. Then click Save.

Fig. 31: Approval Page

The results will then appear in the Completed sub-menu with the submission status.

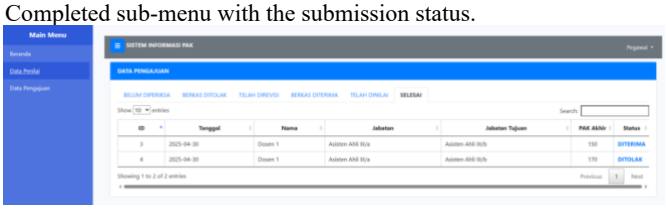

Fig. 32: Completed Applications Page

3. Assessor Page

Before accessing all activities in the system, assessors must first log in by entering their NIP and password, then clicking the Login button.

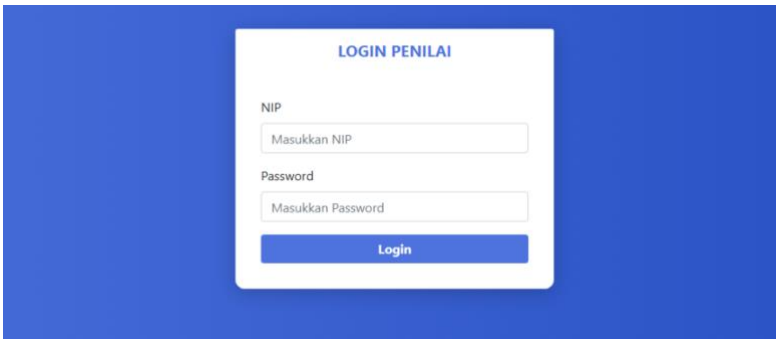

Fig. 33: Assessor Login Page

a. Credit Score Assessment

Registered assessors in the Credit Score Assessment System (SIPAK) may serve as Assessor 1 or Assessor 2 in evaluating documents. Click Submission List to view the queue of applications. To begin assessment, click View Documents.

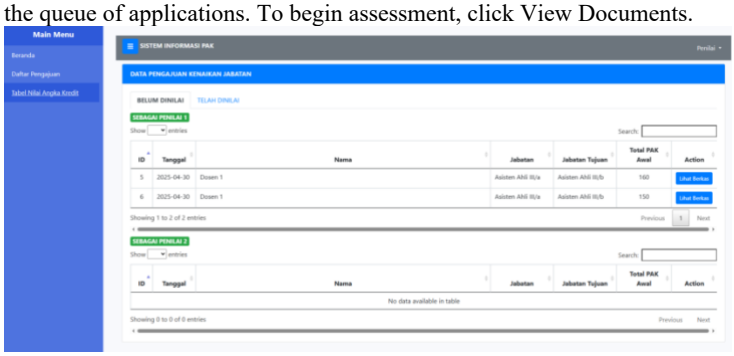

Fig. 34: Submission List Page

Assessors may increase or decrease points for each document by clicking Details & Assess.

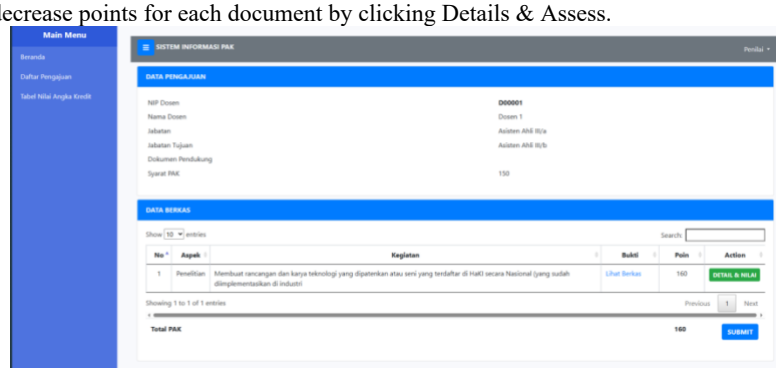

Fig. 35: Submission Details Page

Assessors review the supporting evidence via the Google Drive link. After reviewing, they may adjust the document's points. Once the score matches the document's content, click Save.

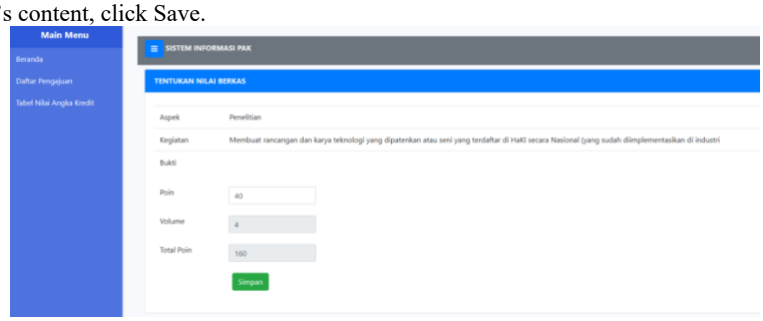

Fig. 36: Assessment Page

Repeat the same steps for the remaining documents. After all assessments are completed, click Submit.

Fig. 37: Submit Assessment Page

The results of the completed evaluation will appear in the Evaluated sub-menu.

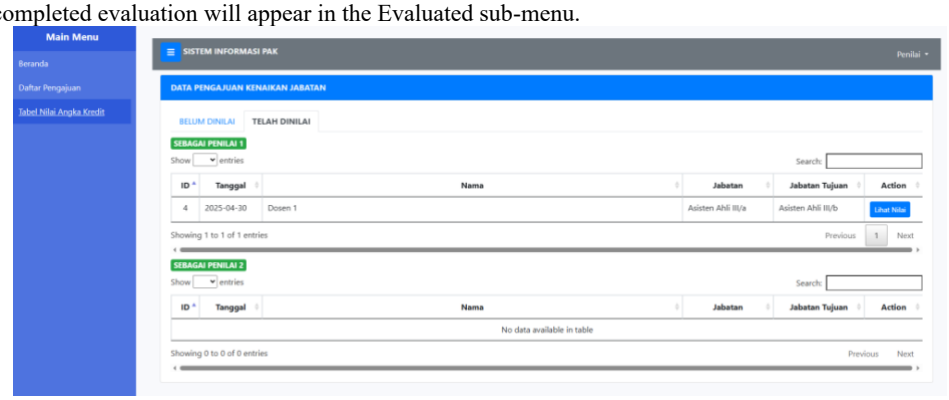

Fig. 38: Evaluated Submissions Page

5. Conclusion

The conclusions obtained by the author in designing this application include Comprehensive Information Integration. This system provides an integrated platform that facilitates lecturers and educators at STMIK TIME in accessing various important information such as profiles, research, community service, teaching materials, and training. This enhances efficiency and accessibility of information. Prototype Approach for Rapid Evaluation and Iteration. The use of the prototype method in system design allows for an initial display that can be quickly evaluated and iterated. This helps in better meeting user needs through continuous feedback and ongoing improvements. Structured Data Collection for Ranking Determination. The system collects structured data that enables the calculation and determination of lecturer and educator rankings based on certain criteria. This includes the number of publications, contributions in community service, and the development of teaching materials, thereby facilitating a more objective performance evaluation.

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