

Design and Development of a Website to Assess Students' Good Deeds Using a Rule-Based Algorithm: A Case Study of Poncol State Vocational High School.

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Doi : <https://doi.org/10.65475/c4k21m62>

Key-Words :

Sistem Informasi, Website, Penilaian Poin Kebajikan, Rule-Based, Laravel, MySQL, Black Box Testing.

Received : April 31, 2026

Revised : June 4, 2026

Published : June 29, 2026

Abstract

The recording of student behavior points at Poncol State Vocational High School still relies on paper forms and separate logbooks. This manual procedure leads to delays in data verification, the risk of miscalculations, and a lack of transparency. This website stores data on students' positive behavior digitally and centrally. To process this data, the system uses a rule-based algorithm through if-then logic. Built using the Laravel framework and MySQL, this program includes features for student activity submissions, teacher verification, and point calculations. Functional testing was conducted using the Black Box method. The test results show that every feature on the admin, teacher, and student pages functions as originally designed. This system is capable of automatically determining eligibility for Field Work Practice (PKL) and grade promotion based on minimum point thresholds. This automated procedure replaces manual record-keeping on paper summary sheets.

1. INTRODUCTION

Students at Poncol State Vocational High School are required to maintain a record of good conduct in order to advance to the next grade or participate in Field Work Practice (PKL). However, the school still faces difficulties in objectively monitoring this aspect of student development. Although a system for awarding good conduct points is in place, the day-to-day recording of these points is still done manually.

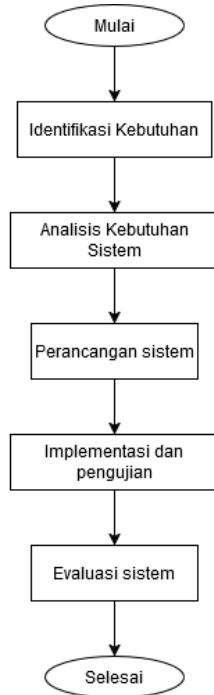
Teachers at the school record every infraction or instance of good behavior by students in a ledger and on sheets of paper. When the end of the semester arrives, teachers must go through these sheets one by one to manually tally students' scores. This method is extremely tedious and prone to miscalculations. Paper records are also easily lost or misplaced. As a result, faculty meetings to determine grade

promotion or eligibility for PKL are often marked by disagreements because the available data is incomplete.

To address these record-keeping challenges, we designed a web-based application using the Laravel framework. We integrated a rule-based algorithm with IF-THEN logic into this system. Through the application of these rules, students' points are automatically accumulated each time a teacher approves their activity reports. When the point total meets a certain threshold, the system immediately generates a recommendation regarding eligibility for the PKL or promotion to the next grade. With this one-stop system, students can submit reports independently, teachers can verify them, and the school can print reports immediately without the administrative burden of paper records

2. METHODS

We designed this system through five main stages: mapping requirements, analyzing system requirements, designing the software, writing and testing the code, and evaluating the final results. Our workflow diagram is shown in Figure 1.



In the initial stage, we collected data directly at Poncol State Vocational High School. We observed the point-recording process and interviewed teachers and staff there to understand how the student conduct point assessment system currently operates. From this field data, we mapped out the functional and non-functional requirements for the application to be developed.

After that, we determined what the system must be able to do for the three user roles: admin, teacher, and student. We programmed the system so that students can submit activity reports independently, teachers can verify those reports, and the system automatically calculates the cumulative score. In addition, we designed the application to assess students' eligibility for vocational training (PKL), determine promotion requirements, and generate final reports.

Moving on to the design phase, we created the system architecture, database structure, and user interface design using UML diagrams. We chose MySQL as the database, while the application itself

was built using the Laravel framework with the Model-View-Controller (MVC) pattern.

When we began writing the code, we used PHP, Laravel, Blade templates, Tailwind CSS, and MySQL. For the decision-making logic, we implemented a simple rule-based algorithm with IF-THEN conditions to check students' accumulated points. We formulated the equation for calculating total points in Equation (1).

$$P_k = \sum_{i=1}^n (B_i \times V_i)$$

Here, P_k is the student's total virtue points. The variable B_i represents the weight of each type of activity completed. Meanwhile, V_i is the teacher's approval status, where we assign a value of 1 if the report is approved and 0 if it is rejected. The variable n indicates the total number of activities submitted by the student. The results of this point calculation are then processed by the school's rule engine to determine whether the student in question can participate in the internship or advance to the next grade.

Finally, we tested the system's feasibility using black-box testing. We tested key functions such as the login process, master data management, activity submission by students, verification by teachers, automatic point calculation, report printing, and the accuracy of decisions made by the IF-THEN rules. We compared these test results directly with the initial design plan to ensure that all features function correctly and without errors.

3. RESULTS AND DISCUSSION

3.1 System Implementation

This good-deed point assessment system is implemented as a web-based application. The technology stack uses the Laravel framework, the PHP programming language, a MySQL database, and Tailwind CSS for the user interface. The primary objective of developing this application is to transition all record-keeping at Poncol State Vocational High School from paper-based systems to a digital system. On a single platform, students submit activity reports, teachers verify the evidence, and the system automatically calculates the accumulated points. Access is divided into three roles: admin, teacher, and student.

The admin's main page is shown in Figure 2. This section serves as the control center. The admin has full access to manage the school's master data, such as the teacher roster, student data, classes, point criteria, rule-based decisions, and report generation. Since all data is managed in one place, storage is more secure and the risk of data discrepancies between tables is minimized.

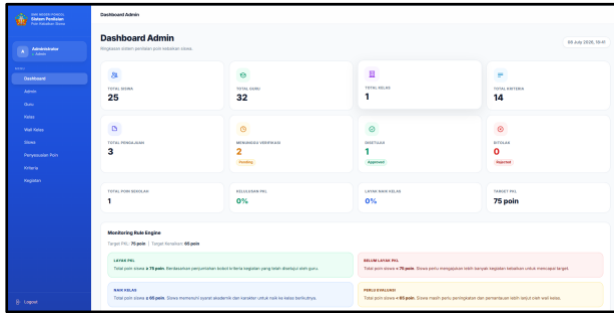


Figure 2. Admin Dashboard

Figure 3 shows the main page for teachers. The page layout is intentionally designed to be simple so that the assessment process remains focused. Before the Rule-Based algorithm calculates points, teachers need to review the evidence of activities submitted by students. Teachers can also monitor students' daily point accumulation history through this page. This type of digital record-keeping reduces work time compared to the old system's method of searching through paper worksheets.

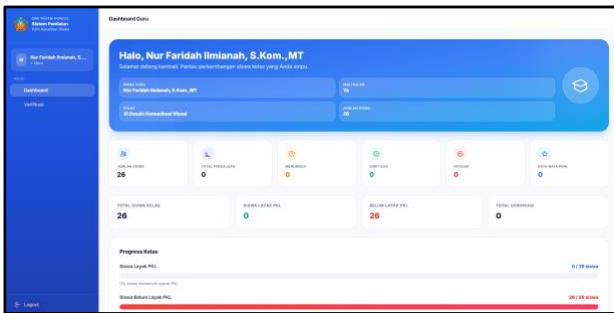


Figure 3. Teacher Dashboard

The main page for the student role is shown in Figure 4. Students use this dashboard to independently report positive activities by uploading photos or supporting documents. Through this page, students monitor the approval status of their reports, the number of points earned, and their history of previous submissions. This system ensures transparency because each student can view the details of their point sources directly.

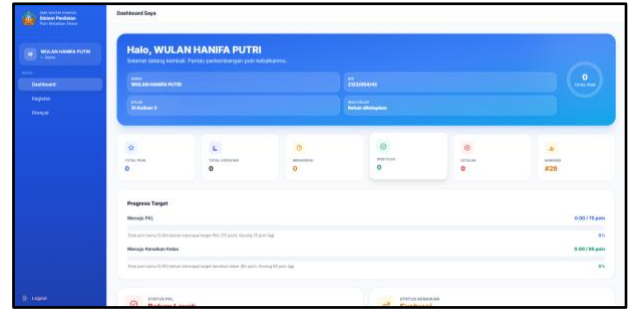


Figure 4. Student Dashboard

Integrating the entire process into a single centralized system resolves the obstacles associated with manual methods. Calculation errors can be avoided, records are stored more neatly, and students' behavioral progress can be monitored directly without the burden of piles of paper.

3.2 Implementation of the Rule-Based Algorithm

A rule-based algorithm is used as the decision-making engine in this system. IF-THEN decision rules, which have been tailored to school regulations, will process the data once a teacher approves a student's activity report. This method ensures that the assessment process is consistent and objective for all students.

A student's total accumulated good conduct points are calculated based on Equation (1).

$$P_k = \sum_{i=1}^n (B_i \times V_i)$$

In Equation (1), P_k represents a student's total merit points. The variable B_i indicates the point weight for the type of activity submitted, while V_i is the teacher's verification status, with a value of 1 if approved and 0 if rejected. The variable n indicates the total number of reported activities. Rejected reports automatically do not contribute any points because their multiplier is zero.

After the points are accumulated, the system compares the total score with the threshold stored in the configuration database. This IF-THEN rule-based evaluation flow runs within a rule engine, as shown in the diagram in Figure 5.

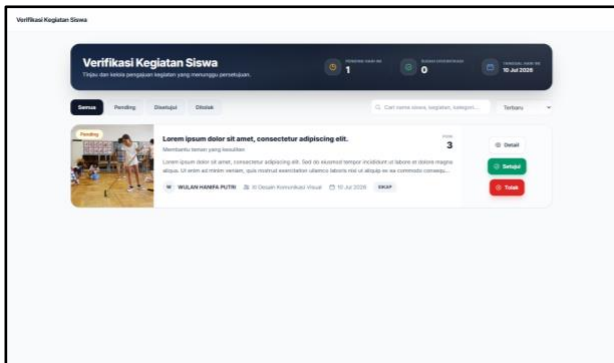


Figure 5. Rule-Based Evaluation Flow

For example, if a student's accumulated points have reached the minimum eligibility threshold for an internship, the student's status automatically changes to "eligible." A similar rule applies to eligibility for promotion to the next grade. Conversely, the eligibility status will remain "ineligible" if the points have not exceeded the minimum threshold. These status updates occur automatically in the background every time a teacher approves a new activity report.

The use of a rule-based algorithm eliminates manual calculations and minimizes data reconciliation errors. All eligibility decisions are based on standardized logical rules, making the evaluation results transparent to both students and the school. These results align with previous research showing that rule-based systems are capable of maintaining decision consistency through fixed, structured logic.

3.3 Black-Box Testing

Functional testing of the application was conducted using the Black-Box Testing method to ensure that each feature operates according to the initial design. The testing focused on the system's external functions without examining the internal structure of the program code. The testing process involved providing specific input data and then comparing the system's output with the expected results.

The test scenarios cover all the application's main menus, ranging from the login process, school data management, student activity submissions, teacher verification, automatic point calculations, determination of eligibility for internships or grade promotion, to report printing. A summary of these test results is presented in Table 1.

No	Functional Module	Number of Test Scenarios	Testing Result
1	Login Authentication	4	Valid
2	Teacher Data Management	3	Valid
3	Student Data Management	3	Valid
4	Class Data Management	3	Valid
5	Assessment Criteria Management	4	Valid
6	Student Activity Submission	3	Valid
7	Teacher Verification	2	Valid
8	Rule-Based Evaluation	5	Valid
Total	All Functional Modules	27	Valid

Based on the test results, all scenarios produced responses consistent with the design. No errors or system malfunctions were found during the testing process. These results indicate that the application has met the school's functional needs and is ready for use to accelerate the process of accurately recording students' good conduct points.

4. CONCLUSION

This study resulted in the development of a web-based student merit point assessment application for Poncol State Vocational High School, utilizing a rule-based algorithm as the basis for decision-making. This application can manage point recording, process activity verifications, automatically calculate scores, and determine eligibility for industrial training and grade promotion through IF-THEN rules predefined in the database. Based on black-box testing, all functional modules operate as planned without any technical issues. The implementation of this system makes the grade tabulation process faster, more consistent, and more transparent for students. Teachers and school administrators are also assisted in making objective decisions based on valid point history data.

ACKNOWLEDGMENT

Many thanks are extended to SMK Negeri Poncol for the permission, assistance, and cooperation provided during data collection in the field. The author also appreciates the guidance from the faculty members of the Computer Science Program at Muhammadiyah University of Ponorogo, as well as the support from all parties who helped bring this research to completion.

REFERENCES

- [1] M. F. Abdurrahman dan A. P. Kusuma, "SISTEM INFORMASI PENILAIAN KARAKTER SISWA BERBASIS WEB DENGAN METODE SAW," vol. 4, no. 2, 2020.
- [2] H. Setiawan, "PENGEMBANGAN SISTEM INFORMASI PANTAUAN PEMBENTUKAN KARAKTER SISWA DI SMK N 2 DEPOK SLEMAN," 2017.
- [3] S. Nugraha, L. Sumaryanti, dan M. Iqbal, "SISTEM INFORMASI BUKU PENGHUBUNG PENILAIAN KARAKTER SISWA SDIT LUQMAN AL-HAKIM MERAUKE," J. Teknol. Inf. Komput. Dan Apl. JTIKA, vol. 6, no. 1, hlm. 298–307, Mar 2024, doi: 10.29303/jtika.v6i1.346.
- [4] MUHAMMAD AKBAR, "DECISION SUPPORT SYSTEM FOR IMPOSING SANCTIONS ON STUDENTS WHO VIOLATE RULES USING THE RULE BASE METHOD CASE STUDY UPTD SMK NEGERI 5 MAJENE," 2024.
- [5] M. D. S. Oktavian, M. A. Samudra, M. Reza, D. D. Satria, dan P. W. Atmaja, "DESAIN DAN PROTOTYPE APLIKASI GAMIFIKASI SISTEM INFORMASI SATUAN KREDIT POIN MAHASISWA BERNARASI 'BELA NEGARA,'" vol. 4, 2024.
- [6] A. Kadir, Pengenalan Sistem Informasi Edisi Revisi. 2014. doi: 10.13140/2.1.2637.6328.
- [7] K. Kunci, "CHARACTER EDUCATION MANAGEMENT," J. Pendidik. Karakter., 2013.
- [8] V. Christmantara dan F. S. Kristianto, "ANALISA DAN PEMODELAN PERANGKAT LUNAK ePOINT KEMAHASISWAAN SEBAGAI PENDUKUNG SKPI DI UNIVERSITAS KATOLIK WIDYA KARYA MALANG," vol. 2, 2019.
- [9] F. Himmah dan M. S. Laouar, "Development of a Web-Based Student Registration System Using Laravel Framework," vol. 02, no. 02, 2025.
- [10] M. Arif, H. S. Mangiri, dan A. Pratama, "Rancang Bangun Sistem Informasi Perhitungan Poin Pelanggaran Siswa Berbasis Website," Inf. Technol., 2023.
- [11] M. S. P. Riyadi, S. Munafis, dan H. Yoga, "RANCANG BANGUN SISTEM INFORMASI AKADEMIK BERBASIS WEBSITE MENGGUNAKAN FRAMEWORK LARAVEL 10 STUDI KASUS SEKOLAH TINGGI ILMU KOMPUTER EL RAHMA".
- [12] I. M. Sobari dan A. Primajaya, "RANCANG BANGUN SISTEM INFORMASI AKADEMIK SISWA BERBASIS WEB DI DTA MIFTAHUL FALAH," vol. 10, no. 1, 2026.
- [13] L. Laravel, "Installation | Laravel 13.x - The clean stack for Artisans and agents," Laravel. Diakses: 13 Juli 2026. [Daring]. Tersedia pada: <https://laravel.com/docs/13.x/installation>
- [14] O. Oracle, "MySQL :: MySQL Documentation." Diakses: 13 Juli 2026. [Daring]. Tersedia pada: <https://dev.mysql.com/doc/>
- [15] R. P. Mulya, M. A. Iktimal, dan C. Anwar, "Pengujian Fungsionalitas Sistem Administrasi Sekolah Berbasis Web (Administrasi Sekolah Web-App) Metode Blackbox Testing," vol. 1, 2025.

Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

Krisna Nurhuda C. Defining the core research idea, searching for reference materials, collecting field data, mapping database tables, writing program code for a Laravel-based application, designing decision rules, conducting tests using the Black Box method, creating visualizations of charts and tables, and drafting the initial version of this article.

Angga Prasetyo Providing technical guidance on program structure, supervising the development of decision-making logic, verifying the functionality of the web application, and providing direct feedback on the draft of this paper.

Fauzan Masyikur Oversaw the writing process from start to finish, verified the consistency of the research methods, evaluated the results of the data analysis,

and refined the writing structure to align with the format of a scientific manuscript.

Sources of Funding for Research Presented in a Scientific Article or Scientific Article Itself

No funding was received for conducting this study.

Conflict of Interest

The authors have no conflicts of interest to declare that are relevant to the content of this article.