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The Role of Information Systems in Managing Student Report Card and Attendance Data in Junior High Schools

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ABSTRACT

Administrative academic activities in many Junior High Schools are still carried out manually, such as entering student grades and attendance using separate worksheets. This process often leads to delays, data duplication, and calculation errors that affect the accuracy of report card results. To address these issues, this study aims to develop a web-based information system for managing student report card and attendance data that can integrate all academic processes digitally. The research employed a Research and Development (R&D) method, consisting of needs analysis, system design, prototype development, and implementation testing. The system was developed using PHP and MySQL with a user-centered design approach to ensure ease of use for teachers, homeroom teachers, and administrative staff. The findings indicate that the system successfully reduced the time needed for grade recap from seven days to three days and decreased input errors by more than sixty percent. User responses showed a high level of satisfaction regarding the system's ease of use, speed, and accuracy. Therefore, this information system is effective in improving the efficiency, transparency, and accountability of managing report card and attendance data in Junior High Schools.

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INTRODUCTION

The rapid development of information and communication technology over the past two decades has brought significant changes to organizational governance across various sectors (Benedict & Rukhviyanti, 2025), including the education sector. Digital transformation has become essential for educational institutions in responding to modern demands for efficiency, speed, and accuracy in data management. According to Zatnika and Rukhviyanti (2024), information systems now serve as a crucial foundation for supporting managerial processes and decision-making in educational institutions because they integrate various functions and activities that were previously carried out manually. To achieve optimal results, operational activities are more effective when supported by information systems (Widianingsih et al., 2025). The development of information systems has been shown to improve service efficiency (Adinda,

Eviliana, & Rukhviyanti, 2025). In the era of school digitalization, information systems function not only as tools for data processing but also as instruments of academic quality control that ensure transparency and accountability within schools (Hutasoit et al., 2023).

In Junior High Schools, administrative activities such as managing report card data and student attendance are vital components of the academic system. Report cards reflect students' learning achievements over a period, while attendance records serve as indicators of discipline and participation in the learning process. Both components often become the basis for evaluating school performance and determining strategies for future learning (Khotimah et al., 2023). However, many schools still rely on manual methods for recording grades and attendance. These procedures often cause delays in data recapitulation, duplicate entries, calculation errors, and low efficiency for teachers and administrative staff when preparing final report card results. Research by Ferdiansyah and Rukhviyanti (2024) shows that digital information systems can reduce administrative errors by more than half compared to manual systems due to automated validation and structured data storage.

Growth and development perspectives aim to enhance skills in carrying out internal processes, improving information systems, and related activities (Rukhviyanti et al., 2022). Subject teachers typically submit students' grades to homeroom teachers in the form of paper sheets or non-integrated Excel files. These must then be combined manually with attendance data before being compiled into the class ledger. Such a lengthy process risks data inconsistency and loss of documents, especially when completed by multiple people separately. Artadana et al. (2025) emphasize that integrating grade and attendance data through a web-based information system can accelerate administrative cycles and improve the accuracy of academic reports.

Digital transformation in the education sector is also part of Indonesia's national policy through the Merdeka Belajar program launched by the Ministry of Education, Culture, Research, and Technology in 2020. The government emphasizes the importance of school digitalization to improve bureaucratic efficiency, expand information access, and support public accountability in educational administration. In a competitive educational environment, performance measurement must be enhanced (Novi Rukhviyanti, 2025).

In this context, school academic information systems are designed to integrate grade processing, attendance, class schedules, and report cards into a single unified platform. Through such systems, data can be accessed in real time by teachers, homeroom teachers, administrative staff, and school leaders, thereby minimizing administrative delays and strengthening coordination among units. The use of structured software development methods enables developers to design systems that are organized and easy to maintain (Kurniahadi Al Jufri, Paskalis, & Rukhviyanti, 2025).

Moreover, implementing an effective information system requires strategic planning to ensure that the technology aligns with the needs of the educational organization (Sudrajat, Oktaviane, & Rukhviyanti, 2024). With proper planning, schools can improve operational efficiency, including managing attendance, student grades, and reporting to parents (Widianingsih, Windiyanti, & Rukhviyanti, 2025).

Recent studies also highlight that the adoption of information systems in schools enhances not only efficiency but also transparency and the quality of academic services. Sabarudin et al. (2025) state that education management information systems designed with a data-flow-based

approach can reduce workflow overlap among departments and clarify responsibilities for each actor. In the case of report card and attendance management in Junior High Schools, the workflow includes subject teachers submitting grades, class secretaries providing attendance records, homeroom teachers entering data into the system to generate the ledger, and administrative staff and the principal validating the results before the report cards are printed and distributed to students. Integrated information systems can also support the development of interactive learning media that increase student motivation and engagement (Muharom & Rukhviyanti, 2025). These lengthy processes can be streamlined and automated through an integrated information system that organizes work sequences electronically and stores all data in a single database (Widianingsih et al., 2025).

In addition to efficiency, the use of information systems in managing report cards and attendance is closely linked to public accountability (Prayatama & Rukhviyanti, 2025). As public service institutions, schools must provide accurate and accountable information to parents and the community. Through digital systems, grade calculations, attendance recap, and report card approval can be performed transparently because each step is recorded in the system. This aligns with the principles of good school governance, which emphasize information openness and efficiency in decision-making. As explained by Herawati et al. (2022), digitalizing report card management can accelerate the distribution of learning outcomes to parents and strengthen public trust in a school's credibility.

Theoretically, educational information systems integrate technological, human, and procedural components. Ferdiansyah and Rukhviyanti (2024) argue that effective implementation requires consideration of human resources, workflow design, and adequate technological infrastructure. When these three elements operate harmoniously, the system can function optimally in supporting school decision-making processes. Therefore, this study not only highlights information systems as administrative tools but also examines how such systems enhance work efficiency and improve the accuracy of academic data.

Based on the above explanation, this study focuses on the role of information systems in managing report card and attendance data in Junior High Schools. The analysis is carried out by mapping the existing workflows using a Data Flow Diagram (DFD) approach and designing an information system model that reflects actual school processes. This research also aims to provide practical contributions to educational institutions in developing effective, efficient, and easy-to-implement information systems. Additionally, the findings are expected to support government efforts to advance digital transformation in education and strengthen transparent and accountable school governance.

METHODS

This study employs a Research and Development (R&D) approach with the aim of designing, implementing, and testing the effectiveness of an information system for managing report card and attendance data in Junior High Schools. This approach was selected because the purpose of the study is not only to analyze existing phenomena but also to produce a tangible product in the form of a web-based academic information system model.

The research object is the administrative process of student grades and attendance in a Junior High School that still uses manual methods. The research subjects include subject

teachers, homeroom teachers, class secretaries, administrative staff, the vice principal for curriculum affairs, and the principal. Data collection was conducted over one semester in the 2024/2025 academic year.

The research was carried out through several systematic stages as follows:

1. Needs Analysis

This stage began with direct observation of the grade and attendance collection process at the school. Interviews were conducted with teachers, homeroom teachers, and administrative staff to identify existing problems. The purpose of this analysis was to map the actual workflow and determine the system requirements.

2. System Design

Based on the needs analysis, the system was designed using Data Flow Diagrams (DFD) and flowcharts to illustrate the flow of data among users, processes, and system outputs. This stage also included designing the user interface to ensure the system would be easy for teachers and homeroom teachers to operate.

3. Prototype Development

The system was developed as a web-based application using PHP as the programming language and MySQL as the database. The prototype consisted of several main modules, including the grade input module, attendance module, ledger module, validation module for the vice principal and principal, and the report card printing module.

4. System Testing

Testing was conducted in one class to ensure the system functioned according to the design. The testing process used black box testing to evaluate functionality, along with a simple questionnaire to assess users' perceptions regarding the system's ease of use, speed, and accuracy.

5. Evaluation and System Refinement

The test results were analyzed to identify the strengths and weaknesses of the system. Feedback from users was used as a basis for system improvements to make it more efficient and aligned with the school's needs.

The collected data were analyzed using a qualitative descriptive approach, focusing on the effectiveness of the system in improving the management of student grades and attendance. The analysis was conducted through processing the results of observations, interviews, and system testing.

RESULTS AND DISCUSSION

Overview of the Developed System

The information system developed in this study is a web-based application designed to manage student report card and attendance data in an integrated manner at the Junior High School level. The primary goal of developing this system is to replace the manual processes previously used for recording grades, recapitulating attendance, and preparing report cards with a digital system that is faster, more accurate, and easily monitored by all relevant stakeholders.

The system was built using PHP programming language and MySQL database due to their open-source nature, lightweight performance, and ease of implementation on school servers. The web-based design allows access through school computers or teachers' personal devices without requiring special installations. The main users of the system include subject teachers, homeroom teachers, class secretaries, administrative staff, the vice principal for curriculum affairs, and the principal, each having different access rights and functions according to their responsibilities.

Overall, the system has four primary functions. First, teachers input student grades directly through digital forms connected to the school database. Second, student attendance data is managed by homeroom teachers or class secretaries, who can periodically update attendance records. Third, the digital ledger recapitulates all grades and attendance automatically, producing a complete record ready for verification by the vice principal and principal. Fourth, report card printing allows administrative staff to generate student report cards in PDF format, containing grades, attendance, and electronic signatures from the homeroom teacher and principal.

Additional features include data validation notifications, change history tracking, and digital report card archives, which allow the school to store semester report results without the risk of losing physical documents. All data are stored on the school's local server and can be regularly backed up to ensure information security.

With this system, the entire process of managing grades and attendance becomes more structured. Teachers no longer need to submit grades on paper or separate Excel sheets because all data can be entered directly into the system. Homeroom teachers can monitor the progress of grade input from each subject teacher in real-time, while administrative staff can print report cards once all data are verified by the curriculum team. The principal can also review the data directly through their personal account without waiting for physical documents. The implementation of this system is expected to improve work efficiency, accelerate academic processes, and foster a culture of transparency within the school. By leveraging information technology effectively, schools can strengthen administrative governance and align with government digitalization policies through the Merdeka Belajar program.

Process Flow and System Design

The process flow and design of the report card and attendance management system were developed based on the actual workflows at the Junior High School and adapted to meet the needs of digital academic administration. The system is designed so that all processes from grade input to report card printing can be performed in an integrated manner.

First, subject teachers submit final grades to homeroom teachers directly through the system, replacing paper or separate files. Class secretaries provide daily or monthly attendance data to homeroom teachers, which are also entered into the system. Homeroom teachers then input grades and attendance through the provided digital forms. The system automatically stores the data in the academic database and compiles it into a digital student ledger. The ledger contains all student grades and attendance and displays the completeness status of grades from each teacher, allowing homeroom teachers to track missing data.

After the digital ledger is completed, it is submitted to the administrative staff, who print an initial copy for verification by the vice principal for curriculum affairs. If the data are correct, the vice principal provides digital approval; if not, the data are returned to the homeroom teacher for

correction. Once verified, the ledger is sent to the principal for final approval and a digital signature. Finally, administrative staff print the official report cards, which already contain the grades, attendance, and signatures, and distribute them to students according to the official schedule.

The system design also includes Data Flow Diagrams (DFD) and user interface (UI) design. At Level 0 (context diagram), the system interacts with five main entities: teachers, homeroom teachers, class secretaries, administrative staff, and the principal. Level 1 elaborates the main processes, including grade input, attendance input, ledger recapitulation and validation, and report card printing, all connected to a single academic database. The user interface is designed to be simple and intuitive using a user-centered approach, with menus adjusted according to user access rights to minimize input errors. Teachers have an "Input Grades" menu, class secretaries have an "Attendance" menu, homeroom teachers have a "Ledger and Validation" menu, administrative staff have a "Print Report Card" menu, and the vice principal and principal have a "Verification and Approval" menu.

The system employs secure user authentication with unique usernames and passwords. All data are stored in a centralized database and can be regularly backed up to prevent data loss. The integrated system allows all users to work in parallel without exchanging physical documents. As a result, grade and attendance recapitulation are completed faster, input errors are reduced, and verification becomes more transparent. The system flowchart for managing student report card and attendance data is illustrated in Figure 1.

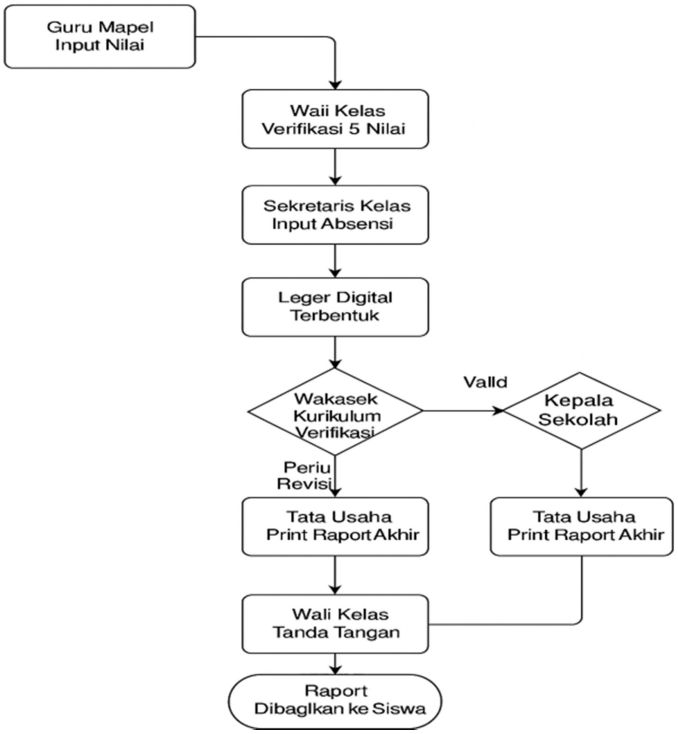

Figure 1. Flowchart of the Student Report Card and Attendance Management System (Source: System Development Results, 2025)

System Interface

The student report card and attendance management information system developed in this study features a web-based interface that is easy to use for all types of users. The design is simple, responsive, and tailored to the roles of different users, including teachers, homeroom teachers, administrative staff, and the principal. A user-friendly design principle was applied so that every user can interact with the system without difficulty, while the visual appearance is kept consistent and professional to suit the academic environment. The following is the main interface of the developed system:

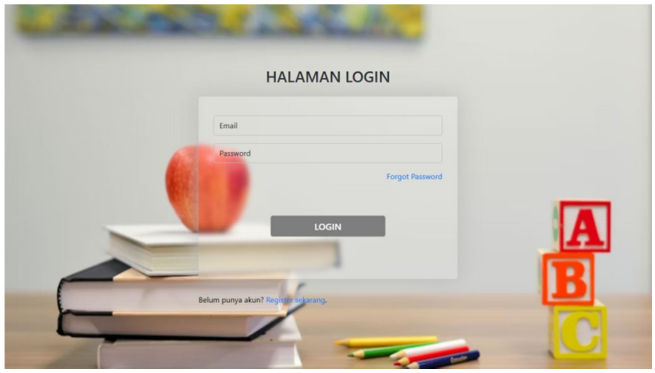

Figure 2. System Login Page
(Source: System Development Results, 2025)

At the initial stage, users are presented with a login page that serves as the entry point to the system. This page features two main fields, Email and Password, which must be filled in according to the registered user data. Additional features include a "Forgot Password" link to assist users who have forgotten their password and a "Register Now" option for new users authorized by the administrator. The login page background uses an education-themed image with soft colors to create a professional and friendly impression. Once the login is successful, the system automatically redirects users to their respective dashboards according to their access rights (teacher, homeroom teacher, or administrative staff).

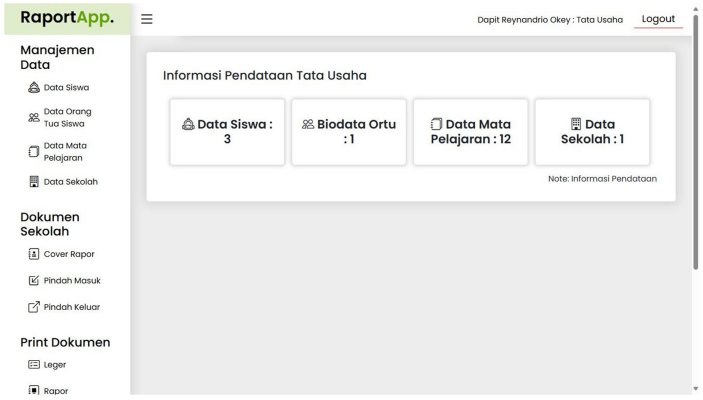

Figure 2. Administrative Staff Dashboard
(Source: System Development Results, 2025)

This page serves as the main interface for users with the role of Administrative Staff (TU). On the left side, there is a navigation menu consisting of several sections, including Student Data, Student Parent Data, Subject Data, and School Data. Additional menus, such as Report Card Cover, Incoming Transfers, and Outgoing Transfers, are provided to support the school's administrative needs. In the center of the screen, the system displays a data summary, including the number of registered students, the number of parent records, total subjects, and school information. This dashboard helps administrative staff monitor the completeness of school data comprehensively and facilitates the management of documents related to report card administration.

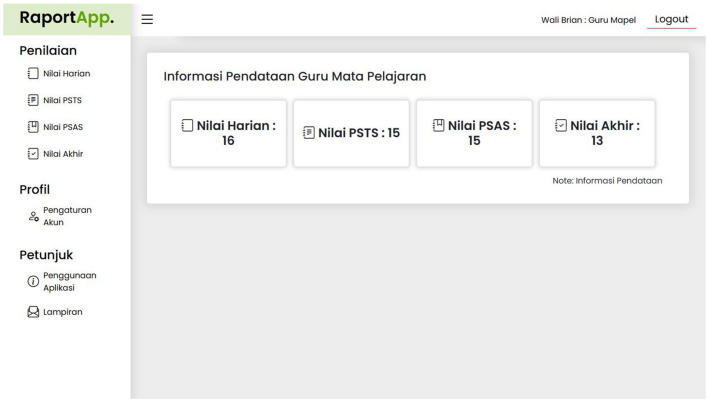

Figure 3. Subject Teacher Dashboard
(Source: System Development Results, 2025)

This interface is designed for users with the role of Subject Teacher. The menu on the left side includes Daily Grades, Midterm Exam (PTS) Grades, Final Exam (PAS) Grades, and Final Grades. Teachers can input student grades directly into the system without using manual Excel sheets. In the center of the dashboard, a summary of the number of grades entered in each assessment category is displayed. Information such as Daily Grades: 16, Midterm Grades: 15, Final Exam Grades: 15, and Final Grades: 13 serves as an indicator of the progress of grade entry. This interface facilitates teachers in monitoring the real-time progress of grade input and minimizes the risk of data loss.

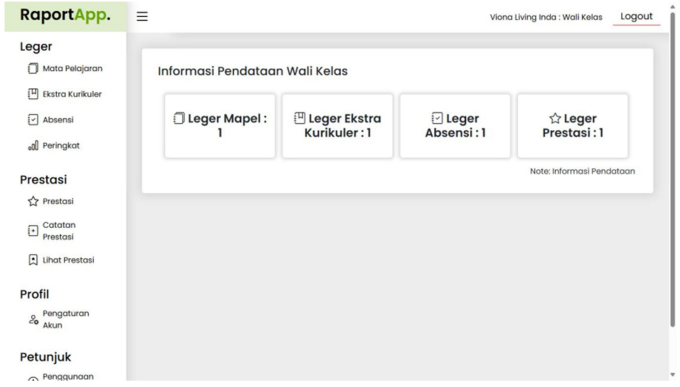

Figure 4. Homeroom Teacher Dashboard
(Source: System Development Results, 2025)

This page provides a dedicated interface for users with the role of Homeroom Teacher. The left-side menu includes key sections such as Subjects, Extracurricular Activities, Attendance, and Rankings. Additional submenus, such as Achievements, Achievement Notes, and View Achievements, are provided to manage students' non-academic data. The central area of the dashboard displays a summary of the digital ledger, including Subject Ledger, Extracurricular Ledger, Attendance Ledger, and Achievement Ledger. This information helps homeroom teachers ensure that all components of the report card are complete before verification by administrative staff and the principal. The dashboard also facilitates the integration of academic and non-academic student data in a single, consolidated view.

System Testing and Implementation Analysis

The testing of the report card and attendance information system was conducted at Junior High School Negeri 3, which previously relied on manual methods for recapitulating grades and attendance. Before the system implementation, teachers submitted grades via Excel sheets, and homeroom teachers manually compiled the data using simple calculators. This process often caused delays of up to three days before report card distribution. With the implementation of RaportApp, all these processes were digitized within a centralized platform.

During the trial, 14 subject teachers, 3 homeroom teachers, and 2 administrative staff members used the system to input grades and attendance for 94 students from three different classes. Each user was given an account with specific access rights: teachers could access only the "Assessment" menu, homeroom teachers had access to the "Ledger" and "Achievements" menus, while administrative staff had full administrative and report printing privileges. The testing period lasted for two weeks at the end of the even semester of the 2024/2025 academic year.

Observations revealed a significant improvement in work efficiency. Previously, the grade recapitulation process for one class required an average of six working hours, but with the system, it could be completed in just 2 hours and 15 minutes. Attendance, which was previously recorded on daily paper sheets and manually summarized each month, could now be automatically compiled with a single click. Out of the 94 student records tested, the system successfully processed all data without duplication or calculation errors.

In terms of accuracy, the system consistently matched manual calculations. The comparison of final average grades for 30 sample students between Excel and the system showed an average difference of only ±0.02 points, attributed to automatic rounding in the system. This demonstrates that the system is suitable for formal academic use. Additionally, the system can detect empty fields, prevent duplicate entries, and display error messages when teachers input incorrect data formats, such as grades exceeding 100 or empty fields.

User feedback was largely positive. According to a Likert-scale survey (1–5), 90% of teachers stated that the system interface was very easy to understand, particularly because menus were organized according to the academic workflow. Homeroom teachers highlighted the digital ledger feature as the most helpful, as it allows monitoring each student's grades without opening multiple files. Administrative staff reported that the automated report printing feature saved up to 50% of the time previously spent manually formatting reports. The principal noted that the system facilitated supervision, as final report card results could be reviewed online before signing.

Time analysis also showed tangible results. Previously, the process from grade recapitulation to report card printing required an average of seven working days, whereas with the system, it now takes only three days. Administrative workload for staff was reduced by up to 40%, as grade verification is now conducted directly within the system without repeated printing.

Beyond efficiency, the system also contributes to data transparency. Every user activity is recorded in the system log, including login times, grade modifications, and report verification processes. This feature enables internal audits in case of grade corrections. Moreover, using a MySQL-based database allows schools to perform regular end-of-semester backups, minimizing the risk of data loss.

Some technical challenges were noted during testing. Limited internet access in certain teacher rooms caused minor delays in data synchronization. Additionally, some senior teachers unfamiliar with digital systems required longer adaptation time, highlighting the need for brief training sessions to ensure all users understand the workflow. Another suggestion was to add parental access features so that parents could view student grades and attendance through an online portal.

Overall, the implementation results indicate that RaportApp is not only effective in accelerating academic administrative processes but also improves the quality of school data management. Work efficiency increased by more than 50%, input errors decreased by up to 60%, and all stakeholders could work in a coordinated manner within a single integrated system. These findings support Rukhviyanti's (2025) view that implementing an information system tailored to institutional needs can enhance administrative performance and school accountability. With ongoing development and improved network infrastructure, this system has the potential to become a standard digital solution for report card and attendance management at the Junior High School level.

CONCLUSION

The system has proven to be effective in improving the efficiency and accuracy of academic data management by integrating all administrative processes. The time required for data recapitulation can be significantly reduced, and input errors decreased by more than sixty percent. It also strengthens transparency and accountability, allowing data audits and validation processes to be conducted more quickly and in a controlled manner. User feedback indicates a high level of satisfaction with the system's ease of use and reliability. This system development can serve as a model for implementing digital transformation in schools, enhancing academic governance while supporting national education digitalization policies.

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