

Web-Based Madrasah E-Report Information System at Madrasah Ibtida'iyah Salafiyah Syafi'iyah Putra

Abdullah Amjad Bawazin ^{1*}, Achmad Baijuri ², Firman Santoso ³

^{1*,2,3} Department of Information Systems, Universitas Ibrahimy, Situbondo Regency, East Java Province, Indonesia.

*Corresponding author: amjadbawazin02@gmail.com.

Received: May 18, 2026; Accepted: June 1, 2026; Published: August 1, 2026.

Abstract: Before this study, Madrasah Ibtida'iyah Salafiyah Syafi'iyah (MISS) Putra managed student assessment data in Microsoft Excel and prepared report cards using the mail merge feature in Microsoft Word. This workflow distributed academic records across multiple files, increasing the risk of data inconsistencies, data-entry errors, duplication, and delays in report card preparation. This study aimed to design and implement a web-based e-report information system that centralizes academic data management and supports grade processing, report card generation, and access to academic information at MISS Putra. The system was developed using the Waterfall model, comprising requirements analysis, system design, implementation, testing, deployment, and maintenance. The application was built with the Laravel framework, PHP, and MySQL. Functional testing was conducted using the black-box method on five core functions: user login, student data management, grade entry, report card generation, and report card printing. The test results showed that all five functions produced the expected outputs. The implemented system centralizes academic records, reduces repeated data entry, and supports more practical access to academic information for administrators, teachers, homeroom teachers, madrasah leaders, and student guardians.

Keywords: E-Report System; Information System; Laravel; MySQL; Waterfall.

1. Introduction

Information technology supports not only teaching and learning but also the management of academic administration in educational institutions. Web-based academic information systems can integrate student records, attendance, grades, and report card preparation, thereby supporting more organized data processing and access to academic information (Arundaa *et al.*, 2023). At Madrasah Ibtida'iyah Salafiyah Syafi'iyah (MISS) Putra, however, student grades are still managed in Microsoft Excel, while report cards are prepared using the mail merge feature in Microsoft Word. This workflow distributes academic records across separate files and requires teachers to submit grade files to the relevant committee and administrative staff for recapitulation. Changes to grade data must consequently be applied across multiple files, increasing the risk of inconsistent records, duplicate entries, data-entry errors, and delays in report card preparation (Pujiasih *et al.*, 2023). The absence of a centralized system also limits the ability of authorized users to monitor and validate academic data, while student guardians cannot independently access information about students' learning progress through a digital service.

Addressing these problems requires a system that reflects the academic administration workflow and user responsibilities at MISS Putra. The system must support administrators, teachers, homeroom teachers,

madrasah leaders, and student guardians, with access rights assigned according to their respective responsibilities. Teachers require facilities for entering grades, whereas homeroom teachers need functions for validating grade data and generating report cards. Administrators manage master and user data, madrasah leaders monitor academic information, and student guardians access the report cards of the students under their supervision. The system must therefore support centralized data management, role-based access control, grade validation, report card generation and printing, and access to academic information rather than focusing only on grade entry.

Previous studies have demonstrated the use of web-based systems for managing grades and preparing report cards. Pujiasih *et al.* (2023) developed a web-based e-report application to support grade entry and report card processing. Ramadhana Bakti and Fauzi (2025) designed a digital report card information system using the Waterfall model, showing how a web-based application could support structured data storage, automated grade processing, and consistent report card output. Effendi and Sulaksono (2021) implemented Laravel in a web-based e-report information system and demonstrated its use in organizing application components through the Model–View–Controller (MVC) architecture. These studies provide a foundation for developing integrated report card systems, particularly in relation to centralized data management, structured development, and automated report generation.

Web-based report card systems have also been developed for madrasah environments. Maimanah and Unggara (2025) developed an online report card system at Madrasah Tsanawiyah Al Mumtaz to manage student grades digitally and reduce reliance on spreadsheet-based processing. Prastya and Mayasari (2025) designed a web-based e-report system for Madrasah Aliyah Swasta Al Ma'arif NU to support the management and presentation of student grades. Although these studies confirm the relevance of web-based report card systems in madrasahs, they were designed for different institutions and administrative settings. They do not address the specific workflow at MISS Putra, where grade processing relies on separate Microsoft Excel files, report cards are prepared through Microsoft Word mail merge, and academic information must be managed across five user roles. The research gap addressed in this study therefore concerns the adaptation of an integrated e-report system to the workflow, validation process, and access structure used at MISS Putra.

This study aimed to design, develop, and implement a web-based e-report information system at MISS Putra using the Laravel framework and a MySQL database. The system was designed to centralize academic records, support grade entry and report card generation, and provide role-based access for administrators, teachers, homeroom teachers, madrasah leaders, and student guardians. Its main functions were evaluated through black-box testing of user login, student data management, grade entry, report card generation, and report card printing. The system is expected to reduce repeated data entry, support more consistent academic data management, simplify report card preparation, and provide authorized users with more practical access to academic information.

2. Related Work

2.1 Web-Based E-Report Systems

Web-based e-report systems have been developed to integrate student data management, grade processing, and report card generation. Wahyudi *et al.* (2024) developed a digital report card information system for an elementary school and reported that the system supported grade processing and reduced the administrative work involved in preparing report cards. Novrina *et al.* (2023) designed a web-based e-report system that integrated student records, grade management, and report card generation on a centralized platform. These studies indicate that web-based systems can replace fragmented file-based workflows by storing academic records in a common database and generating report cards from the recorded data. However, the systems were primarily developed for general schools and did not specifically address the administrative workflow, grade validation process, and distribution of user access required at MISS Putra.

2.2 Laravel-Based Academic Information Systems

Laravel has been used to develop academic information systems because its Model–View–Controller architecture separates data management, application logic, and user interface components. Pangestu *et al.* (2024) used Laravel to develop a website-based e-report application at SMK Pembangunan YPT Palembang that supported student grade management and report card processing. Effendi and Sulaksono (2021) also implemented Laravel in a web-based e-report information system at SD Negeri 1 Kartoharjo. A similar approach was adopted by Suwirmayanti *et al.* (2023) in developing a web-based academic information system at SMA Negeri 1 Kediri. Together, these studies demonstrate the application of Laravel as a technical foundation for structuring academic systems and integrating their functions with a database. Nevertheless, their institutional settings and requirements differ from those of MISS Putra, particularly in relation to the involvement of

administrators, teachers, homeroom teachers, madrasah leaders, and student guardians in a single academic workflow.

2.3 Madrasah-Based Report Card Systems

Digital report card systems have also been implemented in madrasahs to reduce dependence on separate spreadsheet files. Maimanah and Unggara (2025) developed an online report card system at Madrasah Tsanawiyah Al Mumtaz to support the digital management of student grades. Nurwahid *et al.* (2023) designed a web-based e-report system for MTs Daruth Tholibiin Jatisari that centralized the academic data used in report card preparation. Febriana *et al.* (2024) developed a website-based e-report information system aligned with the 2013 Curriculum at MTs Darul Hikam Bantur. These studies demonstrate that digital report card systems can be adapted to madrasah environments, although each system was designed according to the requirements of its institution. The systems do not specifically address the workflow at MISS Putra, where grades are maintained in separate Microsoft Excel files, report cards are prepared using Microsoft Word mail merge, and academic information must be managed and accessed by five user roles.

2.4 Research Position

The reviewed studies provide a foundation for integrating grade and report card data through web-based applications, using Laravel to structure academic systems, and implementing digital report cards in madrasah environments. However, the reported systems were developed for different institutional workflows and do not specifically accommodate the combination of centralized data management, role-based access, grade validation, report card generation, and guardian access required at MISS Putra. This study therefore adapts a Laravel- and MySQL-based e-report information system to the academic administration workflow of MISS Putra. The system centralizes academic records and assigns functions to administrators, teachers, homeroom teachers, madrasah leaders, and student guardians according to their responsibilities. Its contribution lies in integrating these functions within the operational context of MISS Putra rather than proposing a new software framework or development method.

3. Methodology

This study employed the Waterfall model to develop the web-based e-report information system. The model was selected because the system requirements could be identified before development and implemented through sequential stages. The development process comprised requirements analysis, system design, implementation, testing, deployment, and maintenance preparation. This sequence is consistent with the structured development process described by Fahrezi *et al.* (2021). The stages applied in this study are illustrated in Figure 1.

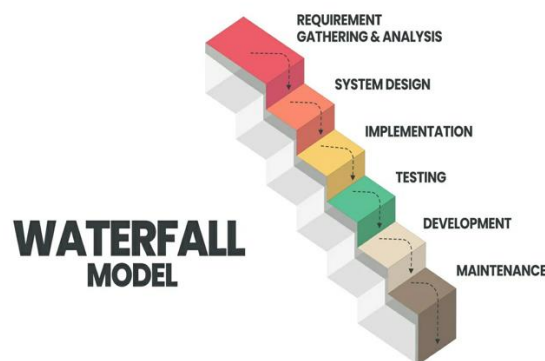


Figure 1. Waterfall Development Model

The study focused on the academic administration process at Madrasah Ibtida'iyah Salafiyah Syafi'iyah Putra, particularly student grade management and report card preparation. Data were collected through observation, interviews, documentation, and a literature review. Observation was used to examine the existing workflow for grade submission, recapitulation, validation, and report card preparation. Interviews with relevant madrasah stakeholders were conducted to identify user needs, operational constraints, access responsibilities, and required system functions. Documentation involved reviewing the academic forms and records used in the existing process, while the literature review provided a theoretical and technical basis for the system development.

3.1 Requirements Analysis

The requirements analysis identified the functional and nonfunctional requirements of the system. The functional requirements included user authentication, student and teacher data management, class and subject management, grade entry, grade validation, academic data monitoring, report card generation, and report card printing. The nonfunctional requirements covered centralized data storage, role-based access control, data security, and ease of use. Access rights were assigned to administrators, teachers, homeroom teachers, madrasah leaders, and student guardians according to their responsibilities in the academic administration process.

3.2 System Design

System design covered the database structure, user interface, and system interactions. MySQL was used to organize and store student, teacher, class, subject, grade, user account, and report card data in an integrated database. The user interface was designed according to the functions available to each user role. System behavior and user interactions were modeled using Unified Modeling Language diagrams consisting of a use case diagram, an activity diagram, and a sequence diagram. The use case diagram in Figure 2 shows the interactions between the system and its five actors. Administrators manage master data, including student, teacher, class, subject, and user account data. Teachers enter student grades, while homeroom teachers validate grade data and generate report cards. Madrasah leaders monitor academic information, and student guardians access the report card information of the students under their supervision.



Figure 2. Use Case Diagram

Figure 3 presents the sequence of activities from user authentication to report card generation and printing. After users log in with their respective accounts, the system displays the functions permitted for their roles. Teachers enter student grades, which are stored and processed by the system. Homeroom teachers subsequently validate the grade data before the report cards are generated, displayed, or printed. Authorized student guardians can then access the report card information through the system.

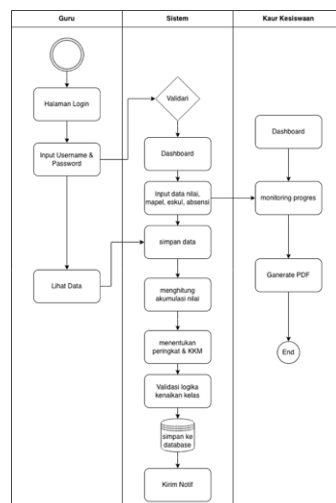


Figure 3. Activity Diagram

The sequence diagram in Figure 4 illustrates the chronological interactions among users, the system interface, Laravel controllers, and the MySQL database. It describes how user requests are received through the interface, processed by the relevant controller, stored in or retrieved from the database, and returned as grade information or report card output.

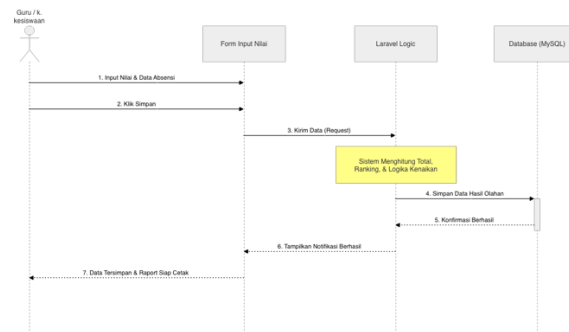


Figure 4. Sequence Diagram

3.3 Implementation

The system was implemented as a web-based application using PHP, the Laravel framework, and a MySQL database. Laravel applies the Model–View–Controller architecture, which separates data management, application logic, and interface presentation. Its use in web-based academic information system development has also been reported by Effendi and Sulaksono (2021) and Suwirmayanti *et al.* (2023). The application was developed as a multi-user system in which administrators, teachers, homeroom teachers, madrasah leaders, and student guardians access functions according to their assigned roles.

3.4 Testing

Functional testing was conducted using the black-box method, which evaluates system behavior by comparing inputs and outputs without examining the internal source code. The testing covered five core functions consisting of user login, student data management, grade entry, report card generation, and report card printing. The test parameters included input validation, role-based access, data storage correctness, grade processing correctness, report card generation, and print output. Each test case specified the input or user action, the expected result, and the actual system output to determine whether the function operated as intended.

3.5 Deployment and Maintenance

The developed application was deployed in the MISS Putra environment to support academic data management and report card preparation. The deployment stage involved making the system available to authorized users according to their access roles. Maintenance was prepared as a post-deployment activity covering error correction, performance adjustments, data backup, and further feature development based on operational needs and user feedback.

4. Result and Discussion

4.1 Results

The implementation produced a web-based e-report information system developed using Laravel, PHP, and MySQL. The system integrates academic data management, grade entry, grade validation, report card generation, and report card printing within a single application. It supports five user roles consisting of administrators, teachers, homeroom teachers, madrasah leaders, and student guardians. Each role is provided with functions and access rights corresponding to its responsibilities in the academic administration process. Before the system was implemented, teachers submitted student grades in separate Microsoft Excel files, and report cards were prepared using the mail merge feature in Microsoft Word. This workflow required separate file management, manual recapitulation, repeated data checking, and updates to multiple files when grades changed. In the implemented system, academic records are stored in a centralized database, allowing authorized users to manage grades, validate data, generate report cards, and access academic information through the same application. The login page shown in Figure 5 authenticates users before granting access to the system. Users enter the account credentials assigned to them, after which the system verifies the information and directs them to the appropriate dashboard. The interface and available functions are determined by the user's assigned role. Figure 6 shows the administrator dashboard, which summarizes the

numbers of active teachers, students, subjects, and classes. It also provides navigation to student, teacher, subject, class, user account, and report card management functions.

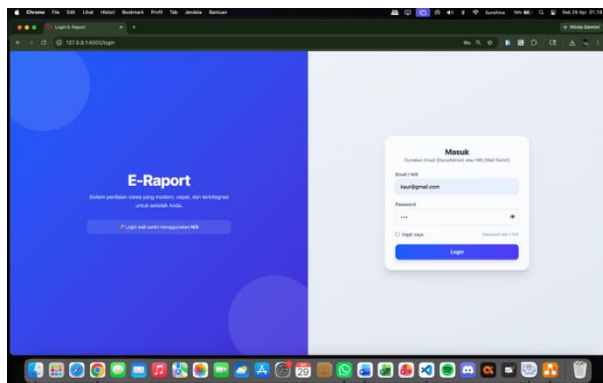


Figure 5. Login Page

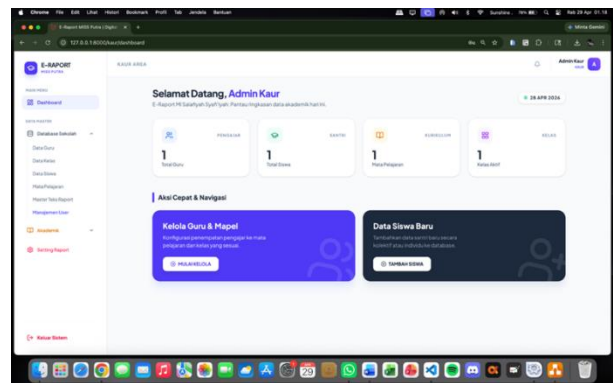


Figure 6. Administrator Dashboard

The student data page shown in Figure 7 enables administrators to add, view, edit, and delete student records. The information presented includes student identification numbers, names, classes, and data management actions. Storing these records in a centralized database reduces the need to maintain the same student information in separate files. The grade entry page in Figure 8 allows teachers or homeroom teachers to select the relevant assessment components and enter student grades. The entered data are stored in the database and used during report card generation.

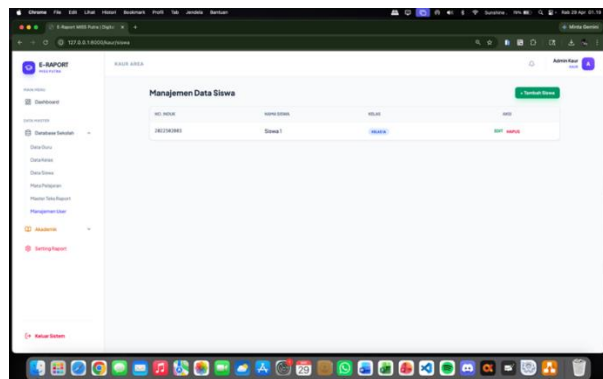


Figure 7. Student Data Page

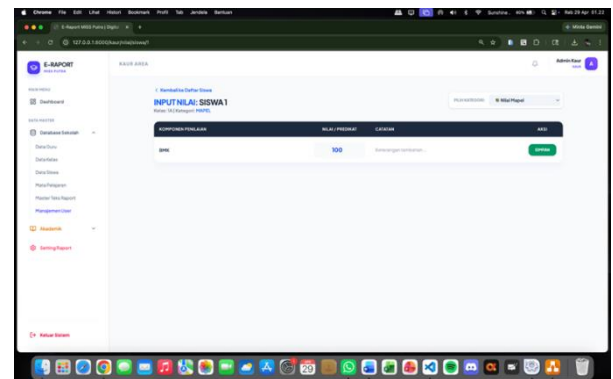


Figure 8. Grade Entry Page

Figure 9 presents the digital report card page, which displays student grades, extracurricular activities, personal development information, and attendance records. Authorized student guardians and madrasah personnel can access the information according to their assigned permissions. The page also provides a PDF output function that generates a printable report card from the academic data stored in the system, removing the need to transfer the data manually to a separate word-processing document.

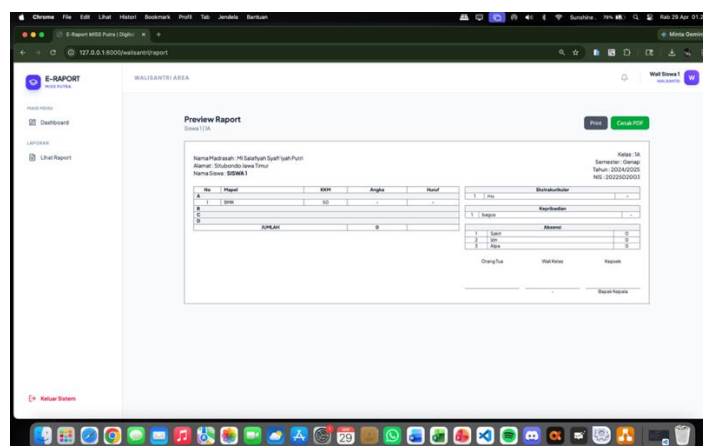


Figure 9. Report Card Page

Black-box testing was conducted to examine whether the core system functions produced the expected outputs. The testing covered user login, student data management, grade entry, report card generation, and report card printing. The evaluated aspects included credential validation, role-based access, data storage, grade processing, report card output, and print output. Table 1 summarizes the functional testing results.

Table 1. System Functional Testing Results

No.	System function	Testing scenario	Expected result	Status
1	User login	The user enters valid account credentials	The system displays the dashboard corresponding to the user's access rights	Successful
2	Student data management	The administrator adds student data	The data are stored and displayed by the system	Successful
3	Grade entry	The teacher enters student grades	The grades are stored and displayed by the system	Successful
4	Report card generation	The system processes the recorded grade data	The system generates the corresponding report card	Successful
5	Report card printing	The user selects the report card printing function	The system produces the report card in the expected printable format	Successful

As shown in Table 1, the five tested functions produced the expected outputs. The login function verified user credentials and displayed dashboards according to assigned access rights. Student data entered by the administrator were stored and displayed by the system, while grades entered by teachers were recorded and used to generate report cards. The system also produced report cards in the expected printable format. These results demonstrate the functional operation of the core features included in the testing scope. Preliminary user feedback was collected from five representatives comprising an administrator, a teacher, a homeroom teacher, a madrasah leader, and a student guardian. The participants evaluated six aspects using a five-point Likert scale, ranging from 1 for *very poor* to 5 for *very good*. Table 2 presents the average scores and their corresponding categories.

Table 2. User Feedback on the Web-Based E-Report System

No.	Evaluation aspect	Average score	Category
1	Ease of use	4	Good
2	Speed of grade entry	4	Good
3	Accuracy of data management	5	Very Good
4	Report card generation	4	Good
5	Access to information	4	Good
6	Overall user satisfaction	4	Good

The feedback results ranged from Good to Very Good. Data management accuracy received the highest average score of 5 and was categorized as Very Good. Ease of use, grade-entry speed, report card generation, access to information, and overall satisfaction each received an average score of 4 and were categorized as Good. These scores indicate that the participating users generally viewed the system positively. Given the limited number of participants, however, the results represent preliminary feedback from user-role representatives rather than a comprehensive assessment of system usability or user acceptance.

4.2 Discussion

The implementation results show that the web-based e-report system consolidates academic records that were previously maintained in separate Microsoft Excel and Microsoft Word files. Its primary contribution to the workflow at MISS Putra is the integration of student data, grades, validation activities, report card generation, and report card printing within one application. This integration reduces the need to re-enter the same information across multiple files and provides authorized users with a common source of academic data. The results do not establish a quantified improvement in processing time or error rates because no before-and-after measurements were conducted. The implementation corresponds with the findings of Pujiasih *et al.* (2023), who reported that a web-based e-report application could support grade entry and report card processing. It is also consistent with Novrina *et al.* (2023), whose system integrated student records, grade management, and report card generation on a centralized platform. From a technical perspective, the use of Laravel follows the implementation reported by Effendi and Sulaksono (2021), in which the Model–View–Controller architecture was applied to organize the components of a web-based e-report system. Ramadhana Bakti and Fauzi (2025) similarly used the Waterfall model to develop a digital report card system supporting structured data storage and report card generation.

Although the system shares its main technological approach with previous studies, it was configured according to the academic administration workflow at MISS Putra. The application distributes functions among administrators, teachers, homeroom teachers, madrasah leaders, and student guardians. Teachers enter grades, homeroom teachers validate academic data and generate report cards, administrators manage master data, madrasah leaders monitor academic information, and student guardians access the report cards of the students under their supervision. The contribution of this study therefore lies in adapting an integrated e-report application to the institutional workflow and access structure of MISS Putra rather than introducing a new framework or software development model. The functional testing results confirm that the five tested features produced the expected outputs under the scenarios summarized in Table 1. User feedback also showed positive initial responses, with five aspects categorized as Good and one as Very Good. These findings support the system's use as an academic administration tool within the tested scope, but they do not provide evidence of technical performance improvements or broad user acceptance. The evaluation involved only five user representatives and did not measure response time, task completion time, error frequency, or server performance. The system also remains limited to grade management and report card processing. Features such as mobile attendance, school payment management, automatic notifications, mobile application access, and automated backup mechanisms were not included. Further development may extend these functions according to institutional needs. Subsequent evaluation should involve a larger group of users and a structured usability instrument to assess ease of use, task completion, user satisfaction, and system effectiveness more reliably.

5. Conclusion and Recommendations

The web-based e-report information system for Madrasah Ibtida'iyah Salafiyah Syafi'iyah Putra was developed using Laravel, PHP, and MySQL. The system integrates student data management, grade entry and validation, academic data monitoring, report card generation, and report card printing within a centralized application. It also assigns access rights to administrators, teachers, homeroom teachers, madrasah leaders, and student guardians according to their responsibilities. Black-box testing showed that the five tested functions consisting of user login, student data management, grade entry, report card generation, and report card printing produced the expected outputs. Preliminary feedback from five user representatives rated five evaluation aspects as Good and data management accuracy as Very Good. Within the evaluated scope, these results show that the system can support the main academic administration workflow at MISS Putra and reduce the need to manage the same data across separate Excel and Word files.

The evaluation was limited to functional testing and preliminary feedback from a small number of user representatives. It did not measure system response time, task completion time, error frequency, security, or usability across a broader user population. Further development may include automatic notifications for student guardians, mobile access, mobile attendance, and scheduled database backup and recovery mechanisms. Future studies should involve more users and apply a structured usability instrument to evaluate ease of use, user satisfaction, task completion, and system effectiveness more reliably.

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