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Development of an Anti-Cheating Online Examination System at MTs Assulaimaniyyah

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Abstract

Digital transformation in the field of education encourages the implementation of online examination systems to improve the effectiveness and efficiency of the learning evaluation process. However, the implementation of online exams still has weaknesses, especially related to supervision and the potential for cheating by exam participants. This study aims to develop a web-based online examination system with anti-cheating features at MTs Assulaimaniyyah. The system development method used is the waterfall method, which consists of the stages of communication, planning, modeling, construction, and deployment. The system was built using the PHP programming language with the Laravel framework and a MySQL database. The anti-cheating features implemented include fullscreen mode, prevention of copy-paste actions, prohibition of using two screens, screenshot restrictions, question randomization, exam time limitations, and tab-switching detection that can cause the exam to stop automatically. The results of the study show that the system is capable of helping the exam implementation process become more effective, simplifying the management of questions and exam results, and improving supervision during the exam. With the anti-cheating features, the system can support the creation of a more honest, fair, and accurate evaluation process, thereby contributing to the improvement of educational quality.

Keywords— *online examination, anti-cheating, digital transformation, laravel, education*

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1. INTRODUCTION

In the current digital era, a transformation is needed from conventional systems to digital technology-based systems in various fields, one of which is the field of education. Digital transformation in education is the process of utilizing digital technology to change learning methods, administration, evaluation, and educational management to become more effective, efficient, and modern. Several forms of digital transformation in the field of education include the implementation of student registration information systems[1], Android-based attendance systems [2] and website-based student attendance monitoring information systems[3]. The existence of digital transformation can improve quality, efficiency, and accessibility in the educational process [4] [5][6].

Online testing systems in the evaluation of the learning process represent a form of digital transformation, as they replace conventional paper-based testing with technology-based methods. With online testing systems, the distribution and completion of questions, as well as the grading of answers, save time because these processes are automated [7][8], reduce archiving costs [9], improve the accuracy of assessment, facilitate grade reporting, and enhance the quality[10].

MTs Assulaimaniyyah is one of the educational institutions in Cianjur Regency. Every academic year, MTs Assulaimaniyyah conducts examinations twice, once each semester. Currently, the examinations are carried out using the Google Form platform for multiple-choice questions, while essay answers are still written on paper sheets. Although Google Form provides convenience in creating and distributing questions, there are still issues related to process efficiency and supervision. The processes of collecting questions, distributing links, and recapitulating scores are still done manually through email and WhatsApp groups, making them time-consuming and prone to errors. In addition, even though there are supervisors in each classroom during the examination, the school still faces difficulties in monitoring, supervising, and ensuring that students do not commit cheating. One of the causes is the lack of an effective online examination platform as well as the lack of a supporting system for virtual supervision [11].

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Based on these issues, it is necessary to develop a web-based online examination system specifically designed for MTs Assulaimaniyyah. This system not only facilitates the implementation of digital examinations but also integrates features that enable more effective monitoring, improve work efficiency, and maintain the integrity of examination results. Therefore, the system will be equipped with various anti-cheating features. This is essential to uphold academic integrity, preserve the institution's reputation, ensure fairness, and foster honesty among students.

There have been studies on the use of various anti-cheating features in online exams, including the randomization of questions [12], using a motion detector with a camera [13], plagiarism analysis of the answers [11], a proctoring system with a recording camera while students take exams and a browser lockdown [14]. Research[15] uses several anti-cheating systems by integrating head posture recognition and eye-tracking technology. The system also enhances security through features such as anti-screenshot protection, clipboard disabling, and prevention of remote answers.

Previous research has focused on specific features. This study will incorporate several anti-cheating features, including the inability to copy questions or answers, take screenshots, or use two screens simultaneously, as well as requiring students to work in full-screen mode. The time limit will be enforced, and questions will be randomized for each student. If a student switches tabs during the exam, the system will issue a warning before automatically terminating the exam.

Although various commercial online testing platforms, such as Moodle, are equipped with security features like browser-based testing, full-screen mode, and navigation restrictions, these features are more general in nature and require additional configuration and expertise from administrators. The custom-built application is more flexible and can meet the operational needs of small-scale schools with limited technical resources. This proposed system is specifically designed to improve the efficiency of exam administration while strengthening academic integrity at MTs Assulaimaniyyah without requiring additional external software.

With the implementation of these anti-cheating features, it is expected that the weaknesses of traditional monitoring methods can be addressed, thereby improving the quality of education by creating evaluations that are more honest, fair, and accurate.

2. RESEARCH METHOD

The system development method in this study uses the waterfall method [16]. The stages in the waterfall method are shown in Figure 1.

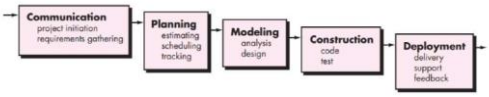


Figure 1. Waterfall model

Below are the stages of system development:

1. Communication
   The process involved conducting field observations and in-person interviews with representatives from MTs Assulaimaniyyah, specifically school administrators, teachers, and staff involved in administering exams. These activities aimed to gather key information regarding the current exam administration process, challenges encountered when using Google Forms, and the features desired in the online exam system to be developed, particularly those related to proctoring and anti-cheating measures.
2. Planning
   At this stage, a development schedule is established, and development tasks are assigned based on the system's main modules. In addition, the technologies and software to be used for the backend, frontend, and database are selected. The entire development process will be carried out using a primary editor that supports modular and efficient development. The planning also includes integration strategies and system testing phases to ensure a smooth implementation.
3. Modeling
   During the analysis phase, modeling was performed using the Unified Modeling Language (UML) and database modeling. The design phase involved designing the table structure and user interface.
4. Construction
   At this stage, the system was built using the PHP programming language and the Laravel framework. Next, black-box testing was performed.
5. Deployment
   At this stage, the system was implemented directly at MTs Assulaimaniyyah. The system is now ready to support the digital and efficient management of online exams, as well as help maintain the integrity of exam results.

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3. RESEARCH RESULT

3.1. Current System Analysis

Before the exam is conducted, the committee distributes the Google Form exam link to the teachers' group. The link is then forwarded by the homeroom teacher to each class's student group, or it can also be written directly on the whiteboard by the supervising teacher in the classroom. Students access the exam using their personal mobile phones. through the link that has been provided. The exam implementation flow with Business Process Model and Notation (BPMN) is shown in Figure 2.

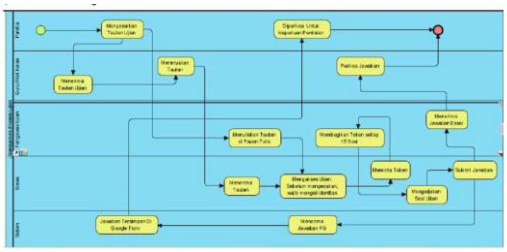


Figure 2. Current system BPMN

3.2. System Modeling

In system modeling using Unified Modeling Language (UML) and Entity Relationship Diagram (ERD), UML is used to describe, design, and document the structure and workflow processes of an online examination system visually. The UML diagrams created in this study are use case diagrams, swimlane diagrams, class diagrams, and deployment diagrams, while ERD is used to describe the database structure and the relationships between tables.

3.2.1. Use Case Diagram

The use case diagram illustrates the relationships between teachers, students, and administrators as actors in the online exam system. The use case diagram is shown in Figure 3.

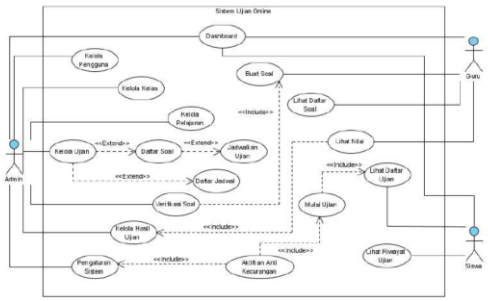


Figure 3. Use case diagram

3.2.2 Swimline Diagram

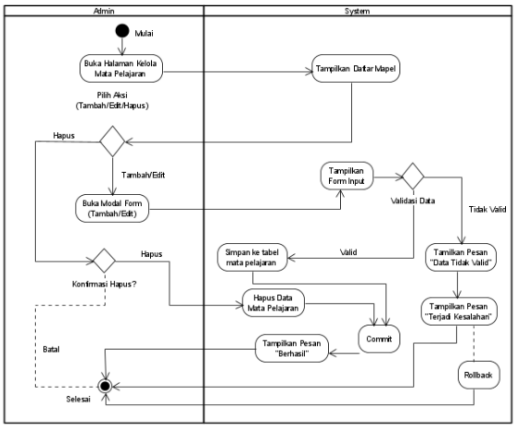


Figure 4. Lesson management swimlane diagram

Figure 4 shows the steps an administrator takes to manage courses through the system. The process begins when the administrator accesses the course management page, and the system displays a list of all available courses from the database or allows the administrator to add, edit, or delete courses.

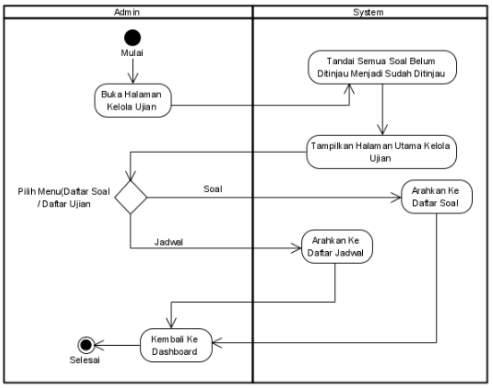


Figure 5. Exam management swimlane diagram

Figure 5 illustrates the process of managing questions and exam schedules by the administrator. This management feature includes two main options: the Question List and the Exam Schedule.

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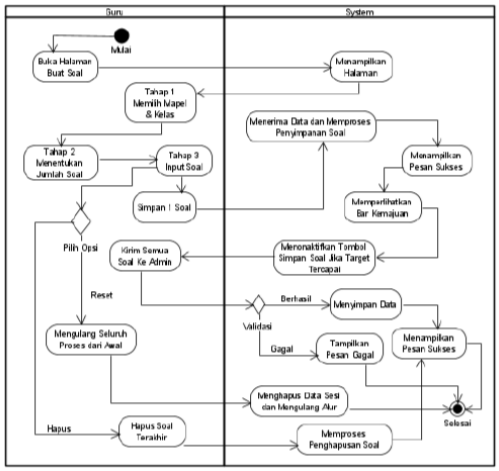


Figure 6. Swimlane diagram for exam question creation

Figure 6 illustrates the process of creating exam questions by teachers. There are three stages in the process: selecting the exam, setting learning objectives, and creating the questions, which consist of the questions themselves and the answer keys.

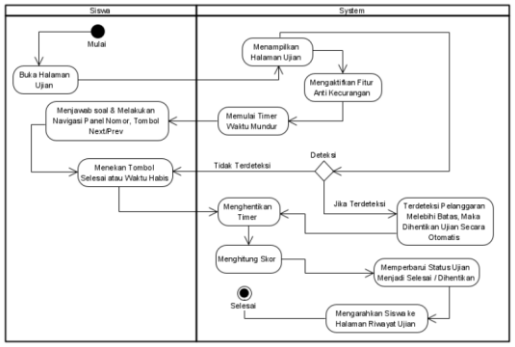


Figure 7. Swimlane diagram of taking an exam

Figure 7 illustrates students taking an exam with anti-cheating features enabled. During the exam, full-screen mode is enabled, copy-paste prevention is enforced, a countdown timer is started to set a time limit for the exam, and an anti-cheating listener is activated to detect tab switching or exiting full-screen mode. If the system detects a violation that exceeds the limits set in the configuration, the system will automatically stop the exam, preventing students from continuing and ending the exam.

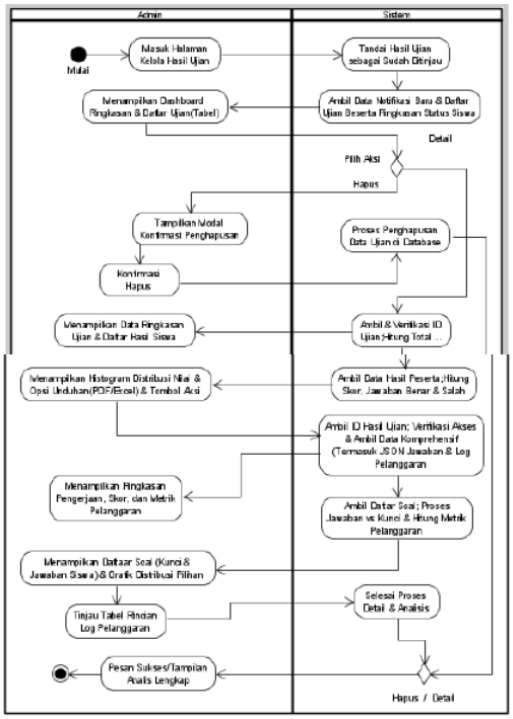


Figure 8. Swimlane diagram for managing examination results

Figure 8 illustrates the process of managing exam results, where the administrator accesses the exam reports menu and can view the details of the exam results and the students' answers. The students' final scores and any breaches committed are calculated in the answer details.

3.2.3. Class Diagram

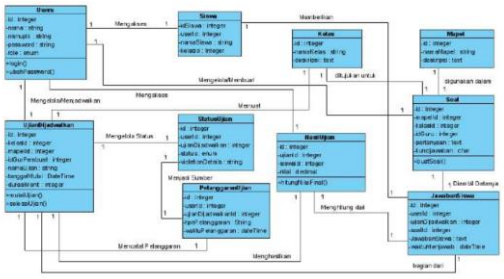


Figure 9. Class diagram

The class diagram shown in Figure 9 illustrates the structure and relationships between classes in the online examination system that has been developed. The diagram includes several main classes, such as users, students, teachers, subjects, questions, exams, results, and settings.

3.2.4. Entity Relationship Diagram

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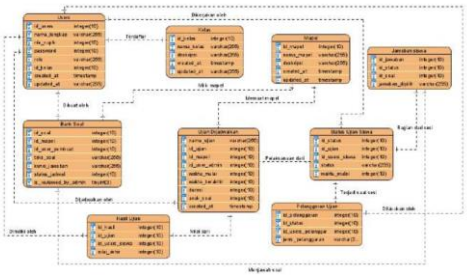


Figure 10. Entity relationship diagram

The Entity-Relationship Diagram (ERD) shown in Figure 10 is a model for designing the database used in the online examination system, illustrating the related entities. With this ERD, the database structure of the online examination system becomes clearer, thereby making it easier for developers to build the system, manage data, maintain information consistency, and support integration between features within the online examination application.

3.2.5. Deployment Diagram

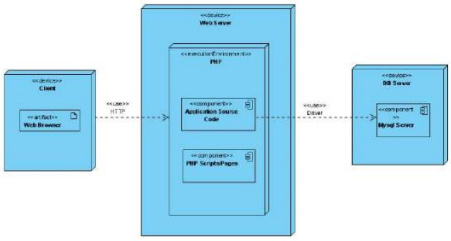


Figure 11. Deployment diagram

The deployment diagram shown in Figure 11 illustrates the physical architecture of the online examination system, which consists of three main nodes: the client, the web server, and the database server. On the client side, there is a web browser component used by students or teachers to access the examination system via the internet.

The web server contains the application source code and PHP scripts/pages that manage the login process, display exam questions, store participants' answers, manage exam timings, and display exam results. The database server hosts a MySQL Server, which stores all system data, including student and teacher details, exam questions, participants' answers, marks, and exam result reports.

3.3. Implementation

The development of a web-based online examination system using the PHP programming language, as well as MySQL for the database management system.



Figure 12. Home page

Figure 12 shows the system's home page. Users click the 'acces' button to access the system, after which they are redirected to the login page.



Figure 13. Login page

The login page is shown in Figure 13. On this page, users enter their username and password as part of the authentication process.

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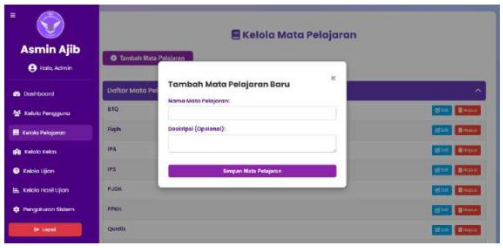


Figure 14. Subject management page

The subject management page is shown in Figure 14. This page is the admin page for adding, editing and deleting subjects.

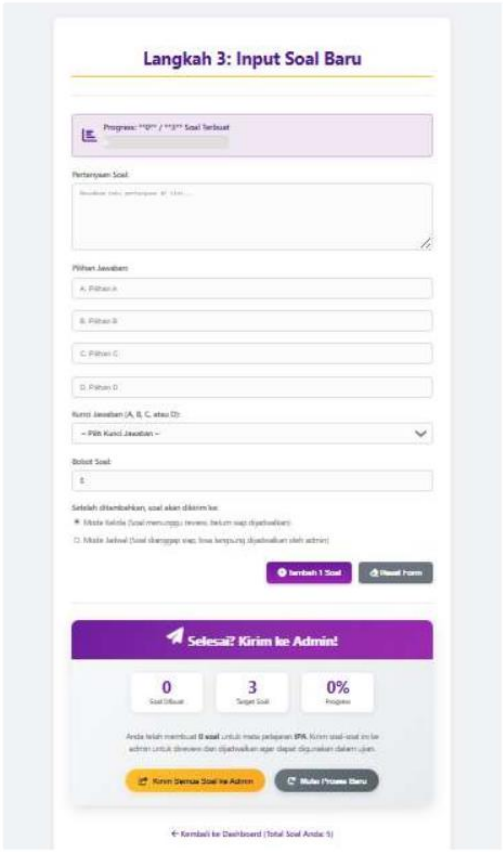


Figure 15. Exam question creation page

The question creation page is shown in Figure 15. On this page, teachers create multiple-choice exam questions after selecting the class and subject to be tested.

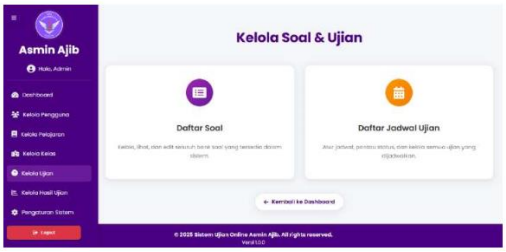


Figure 16. Exam management page

The exam management page is shown in Figure 16. On this page, the administrator manages the list of questions to be used in the exam and creates a schedule for the exams to be held.

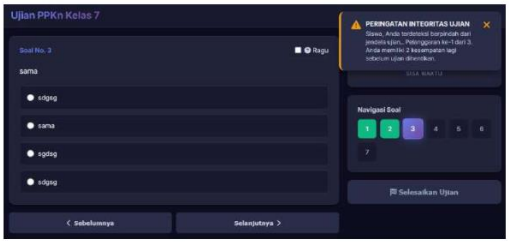


Figure 17. Page for taking exam questions

The exam page is shown in Figure 17. On this page, students enter their answers to multiple-choice questions. The exam is in progress. When a student starts the exam, the system immediately activates anti-cheating features such as forcing full-screen mode and preventing copy-paste, starts the timer, and displays questions one at a time. Students can navigate between questions using the Next and Previous buttons whilst selecting answers. Each answer is saved temporarily.

The anti-cheating features remain active, monitoring actions such as switching tabs or exiting full-screen mode, and if the violation threshold is exceeded, the system may automatically terminate the exam. Students end the exam by pressing the Finish button, which triggers the finalisation of answers and the submission of results.



Figure 18. Exam results management page

The exam results management page is shown in Figure 18. On this page, the administrator can view reports on the results of all exams that have been conducted. These reports can also be downloaded in PDF or Excel format.

3.4. Testing

Testing was carried out using the black-box testing method and employing a decision table

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approach. The decision table was used to map out various combinations of conditions and to determine how the system should respond to each combination.

Input	Output Expectation	Test Result	Status
Nis/Nuptk valid, Password valid	Login successful	Login successful	Pass
Nis/Nuptk valid, Password not valid	Login failed	Login failed	Pass
Nis/Nuptk not valid, Password valid	Login failed	Login failed	Pass
Nis/Nuptk not valid, Password not valid	Login failed	Login failed	Pass

Table I Test Case for Login Testing

The test results for the login menu are shown in Table I. The input consists of a combination of NIS or NUPTK. All test cases were successful, as expected.

Input	Output Expectation	Test Result	Status
Subject Name: IPA Description : Compulsory for Grade VII	Subject successfully added	Subject added	Pass
Subject Name: Mathematics Description : Blank	Subject successfully added	Subject added	Pass
Subject Name: IPA (Data already available)	Failed, Message "Course Name already registered."	Message appears	Pass
Subject Name: Blank Description : "Failed Test"	Failed, Message: "The subject name field cannot be empty."	Message appears	Pass

Table II Test Case for Subject Addition Testing

The results of the tests on adding subjects can be seen in Table 2. Input combinations where the subject does not yet exist and is already available in the database.

Input	Output Expectation	Test Result	Status
Valid students access the exam page. Anti-cheating settings are ON.	The exam page appears, the timer is running, and the finish button is active, but copying and pasting cannot be done.	The test appears, buttons are active, text cannot be selected.	Pass
Valid students access the exam page. The anti-cheating setting is OFF.	Test page appear, Timer walking, Text can be copypasted	Test appears, Text can be selected	Pass
Students click the Finish button	A confirmation pop-up will appear. After	A pop-up appears, then the finalizeExam process is executed.	Pass

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	confirmation, the exam is complete.		
Students perform Tab Switching	Exams are automatically submitted / recorded as cheating	Anti-cheating action run by initAntiCheatListeners()	Pass

Table III Test Cases for Exam Execution Testing

The results of the examination implementation testing are shown in Table III. The testing assessed students' access to examination questions and verified that the anti-cheating features—specifically the prevention of copy-paste and full-screen mode—were correctly activated.

Input	Output Expectation	Test Result	Status
Date, Time, Duration: Complete. Number of Questions: 8	Schedule successfully created and saved	Schedul created and saved	Pass
Date, Time, Duration: Complete. Number of Questions: 15	Failed, Message "The number of questions exceeds the availability."	Message appears	Pass
Date, Time, Duration: (Date blank). Number of Questions: 8	Failed, Message "All fields are required."	Message appears	Pass
Date, Time, Duration: (Date blank). Number of Questions: 15	Failed, Message "All fields are required."	Message appears	Pass

Table IV Test Case Testing the Exam Scheduling

The results of the exam scheduling test are shown in Table IV. The inputs for this test included the date, the duration of the exam and the number of questions.

4. DISCUSSION

The anti-cheating online exam system developed in this study has successfully supported the digital transformation process at MTs Assulaimaniyyah, particularly in the implementation of learning assessments. Before the system was developed, exams were still conducted using Google Forms, and test questions were distributed manually via WhatsApp groups, resulting in inefficient exam management and limited supervision of examinees.

With the system in place, the entire exam management process—from question creation, scheduling, exam administration, to result processing—can be carried out seamlessly within a single web-based platform.

The anti-cheating features implemented are one of the system's key strengths. The system employs full-screen mode, copy-paste prevention, screenshot restrictions, question randomization, time limits, and browser tab switching detection. When a student violates the established limits, the system automatically terminates the exam. This mechanism helps enhance academic integrity and minimizes the likelihood of cheating during exams.

From the user's perspective, the system makes it easier for administrators to manage course data, exam schedules, and exam result reports. Teachers can create questions in a more structured manner, and students can take exams more conveniently using internet-connected devices. Additionally, exam results are available more quickly because the grading process is automated by the system.

Based on the results of implementation and testing, the system operates in accordance with user needs, and all core functions work effectively. Black-box testing indicates that key features—such as login, question management, exam administration, answer storage, and anti-cheating measures—function as intended according to the designed scenarios.

Thus, this online exam system can serve as a solution to enhance the effectiveness of exam administration while supporting the creation of a more honest, fair, and efficient learning evaluation process within the school environment.

5. CONCLUSION

Based on the results of the research and development of an anti-cheating online exam system at MTs Assulaimaniyyah, it can be concluded that:

1. A web-based online exam system was successfully developed using the waterfall method with the PHP programming language, the Laravel framework, and a MySQL database.
2. The system helps make the exam process more effective and efficient because question management, exam scheduling, exam administration, and exam result reporting are integrated into a single platform.
3. Anti-cheating features such as full-screen mode, copy-paste prevention, question randomization, exam time limits, tab switching restrictions, and automatic exam termination can help minimize cheating during exams.
4. The system provides convenience for administrators and teachers in managing exam data and helps students take exams in a more practical and structured manner.
5. Test results indicate that all the system's core functions operate as intended, making the system suitable for use as a platform for conducting online exams at MTs Assulaimaniyyah.
6. The implementation of an anti-cheating online exam system can support digital transformation in education and help create a more honest, fair, and accurate learning assessment process.

6. RECOMMENDATIONS

The following are several recommendations that can be provided for the further development and implementation of this system:

1. The development of additional features such as the inclusion of visual content, camera-based exam proctoring features, and AI-based automatic assessment for essay questions.
2. Improvement of system scalability by optimizing the system architecture and server configuration to accommodate spikes in concurrent users without performance degradation.
3. Conducting user training and performing routine system maintenance.

REFERENCES

[1] Darsanto, "Engineering of Junior High School New Student Admissions System Using System Performance Based Prototype Method," *Nuansa Informatika*, vol. 19, no. 1, pp. 39–49, 2025, [Online]. Available: https://journal.fkom.uniku.ac.id/ilkom39TerakreditasiSINTA5

[2] A. R. Kamila, G. H. Derhass, D. A. Rabbani, F. S. Lee, and J. F. Andry, "Aplikasi Absensi Berbasis Android Pada Sekolah Boarding Sebagai Transformasi Digital Bidang Pendidikan," *Nuansa Informatika*, vol. 18, no. 2, pp. 26–34, 2024, [Online]. Available: https://journal.fkom.uniku.ac.id/ilkom

[3] A. Hendini and D. Kurniawati, "Sistem Informasi Monitoring Orang Tua Terhadap Kehadiran Anak di Sekolah Berbasis Website," *Nuansa Informatika*, vol. 18, no. 2, pp. 154–159, 2024, [Online]. Available: https://journal.fkom.uniku.ac.id/ilkom

[4] R. Purwani, A. Fathoni, S. Sarilan, and H. Siswanto, "Transformasi Administrasi Pendidikan untuk Mengoptimalkan Efisiensi dan Kualitas Layanan Pendidikan pada Era Digital," *Jurnal Keilmuan dan Keislaman*, vol. 4, no. 1, pp. 53–58, 2025, doi: 10.23917/jkk.v4i1.261.

[5] D. Lazwardi and M. A. Kurinawan, "Transformasi Digital Dalam Manajemen Pendidikan Meningkatkan Efisiensi dan Aksesibilitas," *Al-Idarah: Jurnal Kependidikan Islam*, vol. 15, no. 1, pp. 22–30, 2025.

[6] R. R. Tanjung, A. A. Ritonga, B. M. Abdullah, N. A. Siregar, and Armilah, "Transformasi Digital dalam Pendidikan: Meningkatkan Kualitas Pembelajaran Melalui Teknologi," *Sinar Dunia: Jurnal Riset Sosial Humaniora dan Ilmu Pendidikan*, vol. 3, no. 2, pp. 211–217, 2024, doi: 10.58192/sidu.v3i2.2195.

[7] A. Rifai and N. Suryani, "RANCANG BANGUN SISTEM UJIAN ONLINE BERBASIS WEB STUDI KASUS : MDTA NURUL HUDA

p-ISSN :1858-3911* , *e-ISSN : 2614-5405
https://journal.fkom.uniku.ac.id/ilkom

PULOKALAPA," *Jurnal Akademika*, vol. 15, no. 1, pp. 45–48, 2022.

[8] L. Fadhilah, A. Baijuri, and N. Azise, "Sistem Informasi Ujian Online Berbasis Website pada UPT Balai Latihan Kerja Situbondo," in *Semnas Dumai 2025 Sekolah Tinggi Teknologi Dumai*, Dumai, 2025, pp. 443–453.

[9] Supriady and S. Kurnia, "RANCANG BANGUN APLIKASI UJIAN BERBASIS KOMPUTER TINGKAT SEKOLAH DASAR (SD)," *Jurnal Teknik Informatika*, vol. 13, no. 3, pp. 36–45, 2021.

[10] F. Haswan and B. Saputra, "Rancang Bangun Sistem Informasi Ujian Online di SD Negeri 004 Sungai Manau," *Jurnal Sintika*, vol. 1, no. 3, pp. 92–101, 2025, [Online]. Available: https://yasiinpublisher.org/

[11] J. Fawaid, S. A. Wicaksono, and A. D. Herlambang, "Pengembangan E-Learning dengan Modul Pendeteksi Potensi Kecurangan pada Ujian Daring (Studi pada SMPN 3 Situbondo)," *Jurnal Pengembangan Teknologi Informasi dan Ilmu Komputer*, vol. 5, no. 8, pp. 3308–3315, 2021, [Online]. Available: http://j-ptiik.ub.ac.id

[12] D. F. Saefudin, Y. Komalasari, and E. Maesyari, "RANCANG BANGUN APLIKASI UJIAN ONLINE STUDI KASUS: SMK 1 PGRI CIKAMPEK," *JURNAL TEKNOLOGI DAN OPEN SOURCE*, no. 1, p. 14, 2020.

[13] M. P. Pangestu, S. Wiyono, and D. I. Af'idah, "Platform Ujian Online Berbasis Pendeteksi Gerakan Kecurangan Menggunakan Kamera," *Infomatek*, vol. 26, pp. 55–62, 2024, doi: 10.23969/infomatek.v26i1.11208.

[14] M. A. Ghani, R. A. Zuama, D. Gunawan, and A. L. Matihudin, "Implementasi Metode Waterfall Dalam Mengembangkan Sistem Informasi Ujian Online Dengan Fitur Proctoring," *Informatics for Educators And Professionals : Journal of Informatics*, vol. 7, no. 2, pp. 218–225, 2023.

[15] Z. Zheng, S. Lin, and X. Chen, "Design and implementation of an anti-cheating system for exams," in *Fifth International Conference on Computer Communication and Network Security (CCNS 2024)*, Z. Ning and Z. Xiong, Eds., in Society of Photo-Optical Instrumentation Engineers (SPIE) Conference Series, vol. 13228. Aug. 2024, p. 132280R. doi: 10.1117/12.3038056.

[16] P. Roger S, *Software Engineering : a practitioner's approach*. New York: McGraw Hill, 2010.