

Implementation of api chat messenger in the integrated presence system at Nur Azizi Tanjung Morawa private high school

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ABSTRACT

Development of an Integrated Attendance System at the Private Senior High School (SMA) Nur Azizi Tanjung Morawa: Messenger API Integration to Improve Parent-Guardian Communication and Monitor Student Attendance in Real-Time. Advances in information and communication technology have influenced various aspects of life, including education. One technology implementation that is increasingly common is a Radio Frequency Identification (RFID) based attendance system. However, although this system provides the advantage of automatically recording student attendance, delays in providing information to parents regarding student attendance is a major obstacle. To overcome this problem, this research aims to develop and implement a messenger API in the attendance system at Nur Azizi Tanjung Morawa Private High School. This integration is expected to strengthen communication between schools and parents and monitor student attendance in real-time.

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1. INTRODUCTION

Advances in information and communication technology (ICT) continue to change various aspects of human life, including in the field of education. In this digital era, schools are increasingly required to adopt technology to support operational efficiency, especially in terms of recording student attendance. One technology that has been widely implemented in schools is an automatic attendance system that uses various methods, such as Near Field Communication (NFC) and Radio Frequency Identification (RFID). At Nur Azizi Tanjung Morawa Private High School, an NFC-based attendance system had been implemented in the previous year, but there were still several obstacles faced, especially in terms of the speed and effectiveness of conveying student attendance information to parents.

The previous NFC attendance system was able to record student attendance automatically, but did not have the ability to directly send attendance notifications to parents or guardians. This causes a time lag between recording school attendance and receiving the information by parents, so that parents cannot monitor their children's attendance in a timely manner. These delays can impact parents' ability to promptly respond or take action, especially in situations where students are absent from school without their knowledge. This follow-up research aims to overcome these obstacles by developing a more sophisticated and integrated attendance system, through the use of API messenger as the main solution (Mely et al., 2022). The messenger API allows an attendance system based on Radio Frequency Identification (RFID) to not only

record student attendance automatically, but also directly send notifications to parents or guardians via instant messaging. In this way, parents can receive information about their child's presence in real-time, allowing them to monitor and respond to situations more quickly (Yusup, 2022).

Apart from that, it is also hoped that the API messenger integration can strengthen communication between schools and parents. Parents will have better access to their child's attendance information, resulting in closer relationships between schools and families (Salahuddin et al., 2023). In a broader context, this system is also expected to play a role in improving student discipline, because with stricter monitoring from parents, students are expected to be more disciplined in their attendance at school (Ansyori et al., 2022).

It is hoped that the development of this integrated attendance system will not only provide a solution to the problem of late attendance information, but also become a model for other schools in adopting technology to support transparency and accountability (Edo et al., 2024). By utilizing Radio Frequency Identification (RFID) technology connected to an API messenger, this system can also be further developed for other applications in the school environment, such as monitoring teaching and learning activities or student participation in various school activities (Okpatrioka, 2023). Therefore, this research is not only relevant to improve the efficiency of school administration, but also to provide greater benefits in the context of strengthening cooperation between schools and parents in supporting children's education. It is hoped that the results of this research can become a reference for the development of an attendance system in the future, which is more modern, efficient, and able to meet the communication needs between schools and parents more optimally (Nishfi et al., 2023). Parents have expressed high satisfaction with the system, as it allows them to monitor their children's attendance in real-time, tracking when their child arrives at and leaves the school. This real-time monitoring enhances their involvement in ensuring their child's safety and well-being during school hours.

2. RESEARCH METHOD

This research uses a Research and Development (R&D) approach (Waruwu, 2024), which aims to develop and test the effectiveness of a product, in this case an integrated attendance system that combines Radio Frequency Identification (RFID) technology with API messenger.

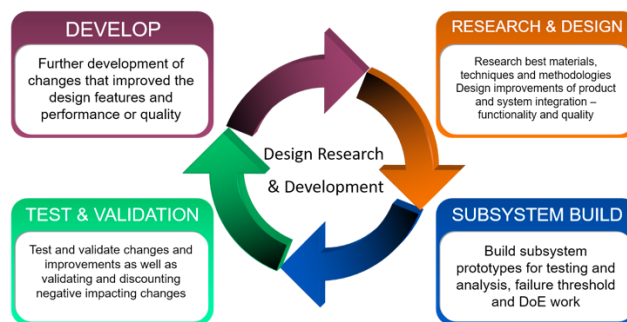


Figure 1. Design R&D

The initial stage of this research was carried out by collecting information from various relevant literature, such as scientific journals, books, and other documents that discuss RFID-based attendance technology, messenger APIs, and the application of technology in educational environments (Afrizal Amrustian, 2024). The aim of this literature study is to understand the development of attendance technology and evaluate existing systems, especially the use of NFC systems in previous research (Rahmaddion & Arribe, 2023).

Research is focused on developing an RFID-based attendance system that is integrated with the messenger API. This process begins with system design, namely creating an architectural design that includes hardware such as RFID readers and cards, as well as software in the form of an attendance system connected to a messenger API (Arribe & Ryandi, 2023). Next, coding and implementation were carried out, where software was developed to enable integration between RFID and messenger APIs in order to send real-time notifications to parents. After the system has been developed, initial testing is carried out to ensure that all components work as expected, both in terms of functionality and reliability. The system that has been developed will be tested at Nur

Azizi Tanjung Morawa Private High School by involving a number of students, teachers and parents to evaluate its functionality in real situations (Silpia et al., 2023). This trial will monitor student attendance via RFID and ensure that attendance data is automatically sent to parents (Koirum Hasibuan et al., 2023). Additionally, parents' responses to notifications will be observed, including how quickly notifications are received and their response to the new system. This stage also aims to identify technical problems that may arise during testing, such as notification delays, system errors, or hardware problems, for further improvement (Septiani Nurfauzia Koeswara et al., 2024).

After the trial phase is complete, an evaluation is carried out to assess the effectiveness and efficiency of the system being developed (Roy et al., 2024). This evaluation includes analysis of trial data and responses from all parties involved (teachers, students and parents). Based on the results of this evaluation, improvements and improvements to the system will be made to overcome problems found during testing.

3. RESULTS AND DISCUSSIONS

Based on the design method and development results using the Laravel framework, the design results are as follows:



Figure 2. Login system

The login page is designed as the first step in carrying out the attendance process, which is accessed by the class teacher or homeroom teacher before proceeding to the stage of recording attendance. This feature ensures that only authorized users can access the attendance system, thereby maintaining the security and accuracy of attendance data (Fatimah Zahra & Yulianti, 2023). With this login system, class teachers or homeroom teachers can easily manage student attendance in a structured and efficient manner before starting learning activities in class (Defriani et al., 2022).

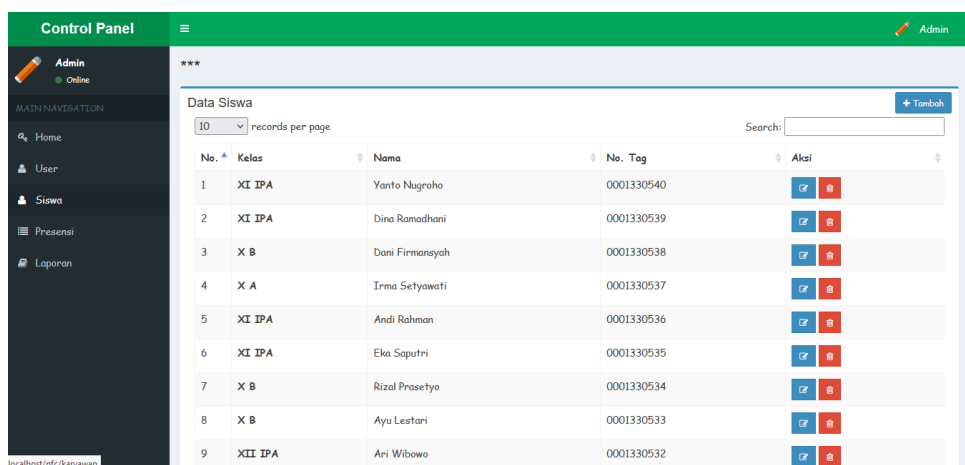


Figure 3. Class management

The student class data management page is designed to manage important information related to student attendance. This page includes student data, class data, and other information relevant to the attendance recording process. This data serves as the main basis for ensuring the

accuracy and completeness of student attendance data collection (Afrizal Amrustian, 2024). Through this page, managers can easily verify and update student information as needed, thereby supporting the smooth attendance process and structured attendance analysis (Mumtahana, 2022).

Presensi

Tag Number

#	Nama	Kelas	Tanggal	Waktu
ACCEPTED	Yanto Nugroho	XI IPA	16-10-23	12:30
ACCEPTED	Dina Ramadhani	XI IPA	16-10-23	12:12
ACCEPTED	Dani Firmansyah	X B	16-10-23	12:13
ACCEPTED	Irma Setyawati	X A	16-10-23	12:23
ACCEPTED	Andi Behman	VI IPA	16-10-23	12:14

Figure 4. Presence data collection process

The process of collecting attendance data is carried out using the card owned by each student. Each student will use the card to register attendance via a card reader device, such as an RFID reader, which is connected directly to the attendance system (Husain et al., 2023). This system automatically records student attendance quickly and accurately into a database, ensuring that the resulting data matches the identity of the card owner (Ilham & Yuniarti, 2022). This approach not only simplifies the process of recording attendance, but also increases efficiency and reduces the possibility of errors in manual data collection.

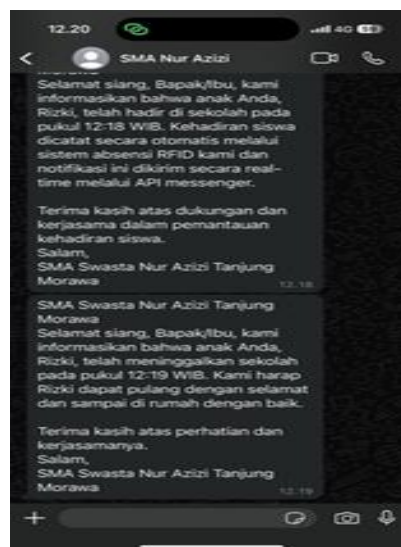


Figure 6. Whatsapp notification

This system is designed to automatically send WhatsApp notifications to parents every time students arrive at school or leave school. This notification contains information such as student attendance or departure time, which is taken directly from RFID-based attendance data. With this feature, parents can monitor student activities in real-time, providing peace of mind and ensuring better communication between school and parents. The system is also designed to work efficiently with the WhatsApp API (Rahmawati et al., 2022), ensuring notifications are sent quickly and correctly (Mukhtar et al., 2020). Unit operations, enabling a more organized and transparent

rental process (Pada et al., 2023). Additionally, this feature helps improve asset management efficiency and contributes to overall business unit revenue (Hayati et al., 2021).

4. CONCLUSION

The implementation of an RFID-based attendance system connected to API Messenger at Nur Azizi Private High School has succeeded in increasing efficiency in recording student attendance and strengthening communication between the school and parents (Apriati et al., 2022). This system allows for automatic and real-time attendance recording, as well as providing direct notification to parents regarding their child's presence (Suprapti et al., 2022). This not only increases parental involvement in monitoring student attendance, but also reduces the administrative burden on the school. The accuracy of the data and positive feedback from users indicate that this system has potential for further development and application in other educational institutions. The implementation of the RFID-based attendance system connected to the API Messenger at Nur Azizi Private High School has successfully increased efficiency in recording student attendance and strengthened communication between the school and parents (Apriati et al., 2022). This system allows for automatic and real-time attendance recording, as well as providing direct notifications to parents regarding their child's presence (Suprapti et al., 2022). This not only increases parental involvement in monitoring student attendance but also reduces the administrative burden on the school. However, the system is currently limited to student attendance recording and has not yet been developed to support other functions, such as teacher attendance tracking or extracurricular activity monitoring. Additionally, the security of students' and parents' personal data needs to be a primary focus for future development. The accuracy of the data and the positive feedback from users indicate that this system has potential for broader application and further development in other educational institutions.

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