

Implementation of Kodular for Developing an Online Attendance System at Bhakti Bangsa Junior High School

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ABSTRACT

Attendance is a crucial component of educational administration, closely related to teacher discipline and accountability. However, at SMP Bhakti Bangsa Sunggal, attendance is still conducted manually, often leading to delayed recapitulation, recording errors, and data manipulation. This research aims to develop an Android-based teacher attendance application utilizing the Kodular platform integrated with Google Sheets/Firebase as a digital solution that is efficient, transparent, and accurate. The research employed a Research and Development (R&D) approach with the System Development Life Cycle (SDLC) Waterfall model, which consists of needs analysis, system design, implementation, testing, and maintenance. The resulting application includes features such as user login, attendance through QR-Code scanning, automatic attendance recording, daily and monthly attendance reports, and exporting reports in Excel/PDF format. Black-box testing confirmed that all functions operated properly. Furthermore, trials involving 22 teachers and one administrative staff member showed “very good” responses, with scores of 93% for ease of use, 89% for speed, 91% for accuracy, and 92% for user satisfaction. Based on these findings, the Kodular-based attendance application is proven feasible and effective in replacing the manual system at SMP Bhakti Bangsa Sunggal. The application enhances administrative efficiency, improves data accuracy, and supports the school’s digital transformation in managing teacher attendance.

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1. INTRODUCTION

The development of information technology has significantly influenced various aspects of human life, including the education sector. One of the important administrative activities in schools is student attendance recording. Traditionally, attendance is still conducted manually using paper-based systems, which often lead to several problems such as data inaccuracies, inefficiency in data processing, and the risk of data loss.

The advancement of mobile technology, especially Android-based applications, provides opportunities to develop more efficient and accurate attendance systems. One of the solutions is by utilizing QR Code technology, which enables fast and secure data recording. By integrating QR Code with mobile applications, the attendance process can be automated and recorded in real time.

Kodular is a visual programming platform that allows users to develop Android applications without extensive coding knowledge. It offers an effective way to build functional applications quickly. In addition, integration with Google Sheets enables real-time data storage and easy access to attendance records.

Several previous studies have discussed digital attendance systems; however, many of them still require complex programming or lack real-time data integration. Therefore, this study aims to develop an online attendance application using Kodular integrated with QR Code and Google Sheets to improve efficiency, accuracy, and ease of use in attendance management.

The objective of this research is to design and implement an Android-based attendance system that can simplify the attendance process and provide accurate, real-time data for users.

2. METHOD

This study uses the Research and Development (R&D) method to design and develop an Android-based online attendance system. The system is developed using the System Development Life Cycle (SDLC) with the Waterfall model, which consists of several sequential stages.

The first stage is requirement analysis. In this stage, data is collected through observation and literature study to identify problems in the current attendance system. The analysis shows that manual attendance is inefficient, prone to errors, and difficult to manage.

The second stage is system design. At this stage, the system architecture, user interface, and database structure are designed. The application is designed to include features such as login authentication, QR Code scanning for attendance, and automatic data recording into Google Sheets.

The third stage is implementation. The system is developed using Kodular as a visual programming platform to create the Android application. Google Sheets is integrated as a real-time database to store and manage attendance data.

The fourth stage is testing. The developed application is tested to ensure that all features function properly. The testing process includes functional testing of the login system, QR Code scanning, and data synchronization with Google Sheets. The system is also evaluated based on usability and performance aspects.

The final stage is maintenance. This stage involves improving and updating the system based on testing results and user feedback to ensure the application runs effectively and efficiently.

The overall research procedure follows a structured and systematic approach to ensure that the developed system meets user requirements and provides accurate attendance data.

3. RESULTS AND DISCUSSION

This section presents the results of the developed online attendance system and discusses its performance and effectiveness.

3.1 System Implementation

The developed system is an Android-based application created using Kodular. The application provides several main features, including user login, QR Code scanning for attendance, and automatic data recording into Google Sheets.

The login interface of the application is shown in Figure 1. This feature ensures that only authorized users can access the system.

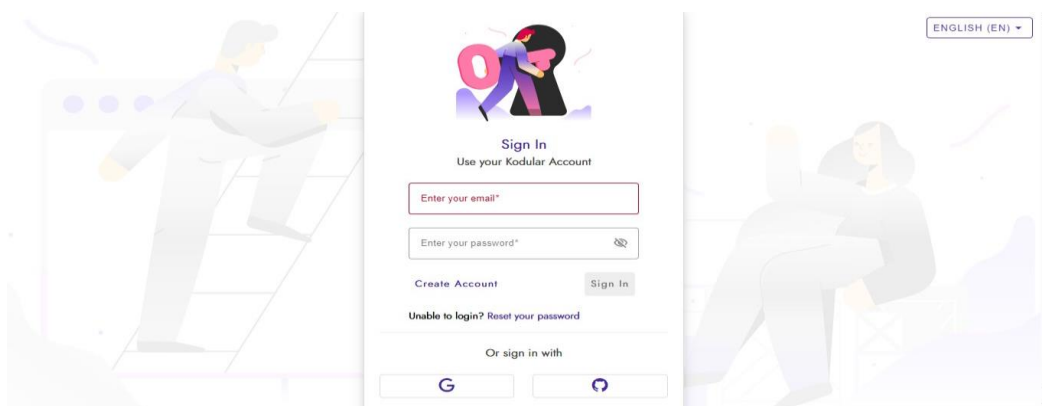


Figure 1. Login Interface of the Application

After logging in, users can access the QR Code scanning feature as shown in Figure 2. This feature allows users to scan QR Codes for attendance quickly and accurately.

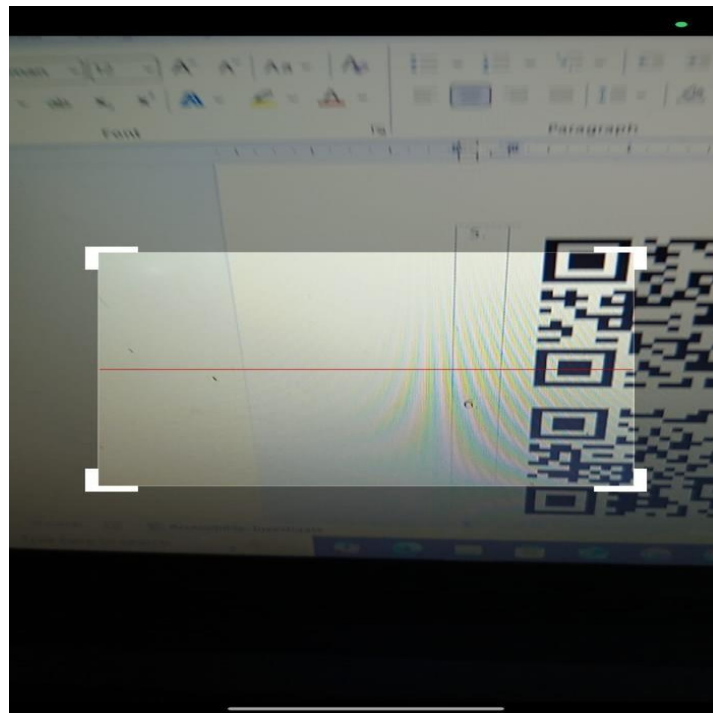


Figure 2. QR Code Scanning Feature

The attendance data is automatically stored in Google Sheets, as presented in Figure 3. This enables real-time data recording and easy data management.

				Selasa	Rabu	Kamis	Jumat	Sabtu	Minggu	Senin	Selasa	Rabu	Kamis
				30/08/2025	31/08/2025	27/08/2025	28/08/2025	29/08/2025		01/09/2025	02/09/2025	03/09/2025	04/09/2025
NO	WA	NAMA	J.K	DATANG	PULANG	DATANG	PULANG	DATANG	PULANG	DATANG	PULANG	DATANG	PULANG
1	tel:085276477712	Khairil Imam Amri Tanjung	L					TELAT	P	TELAT	P		
2	tel:083165696365	Isma Nurmayati	Perempuan					00:44:01	21:11:58	0:23:08	0:23:48		
3	tel:081269977202	Sri Rahayu Endang Lubis	Perempuan							0:24:03	0:24:37		
4	tel:0852166677325	Tasya Misriah	Perempuan							0:24:50	0:24:50		
5	tel:089505807976	Azzam Zains	L							0:24:18	0:24:18		
6	tel:082363145553	Elisabeth Laura Sihombing	Perempuan							0:26:14	0:26:14		
7										0:26:28	0:26:28		

Figure 3. Attendance Data Stored in Google Sheet

3.2 System Testing Results

The system was tested to evaluate its functionality and usability. The testing results indicate that all features of the application function properly.

The login feature works securely, while the QR Code scanning process operates quickly and accurately. The system is also capable of storing attendance data in real time without significant delays. The results of system testing are summarized in Table 1.

Table 1. System Testing Results

NO	Fitur	Skenario	Hasil yang Diharapkan	Hasil Uji	Status
1	Login	Username & password benar	Masuk ke aplikasi	Berhasil	Valid
2	Login	Username & password salah	Ditolak + pesan error	Berhasil	Valid
3	Scan QR	QR-Code valid	Data absensi Tercatat	Berhasil	Valid
4	Scan QR	QR-Code tidak valid	Pesan error	Berhasil	Valid
5	Rekap Kehadiran	TU membuka laporan	Data tampil Sesuai	Berhasil	Valid
6	Unduh Laporan	TU mengekspor data	File Excel/PDF tersedia	Berhasil	Valid

3.3 Discussion

The implementation of the QR Code-based attendance system significantly improves efficiency compared to manual attendance methods. The use of Kodular simplifies the development process, while Google Sheets integration enables real-time data storage without complex database management.

Compared to traditional attendance systems, the developed application reduces errors and speeds up the attendance process. However, the system still has limitations, such as dependency on internet connectivity and the requirement for Android devices.

Overall, the results show that the developed system provides a practical and efficient solution for attendance management.

4. CONCLUSION

Based on the results of this study, it can be concluded that the Android-based online attendance system developed using Kodular and integrated with QR Code and Google Sheets has been successfully implemented. The system is able to address the problems found in manual attendance processes, such as inefficiency, data inaccuracies, and difficulties in data management.

The implementation results show that the system performs effectively, with high functionality and usability levels. The use of QR Code technology enables faster and more accurate attendance recording, while Google Sheets integration allows real-time data storage and easy access for users.

Overall, the developed application provides a practical, efficient, and user-friendly solution for attendance management. For future work, the system can be further improved by adding additional features and enhancing system security and compatibility across different devices.

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