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DEVELOPMENT OF AN ATTENDANCE APPLICATION USING QUICK RESPONSE CODES BASED ON APPSHEET AT PT XYZ

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ABSTRACT

This study aims to develop a digital attendance application based on AppSheet using Quick Response (QR) Code as a solution for recording employee attendance at PT XYZ. The development of this application is motivated by the fact that the attendance system is still manual and relies on CCTV monitoring, which is considered inefficient, inaccurate, and difficult to use for recapitulating employee attendance and overtime. The research method used is Research and Development (R&D) with the ADDIE development model, which includes the stages of analysis, design, development, implementation, and evaluation. Data collection techniques were carried out through observation, interviews, pre research questionnaires, and documentation studies. The results showed that the AppSheet based digital attendance application developed was capable of recording employee attendance in real time, automatically, and integrated with a cloud based database. This application also facilitated the attendance monitoring process by administrators and improved the neatness and accuracy of attendance data. Based on limited trials, the digital attendance system was deemed feasible and effective in improving the efficiency of employee attendance administration at PT XYZ.

Keywords: AppSheet, Application development, Attendance, Quick response codes

ABSTRAK

Penelitian ini bertujuan untuk mengembangkan aplikasi presensi digital berbasis AppSheet dengan pemanfaatan Quick Response (QR) Code sebagai solusi pencatatan kehadiran karyawan di PT XYZ. Pengembangan aplikasi ini dilatarbelakangi oleh sistem presensi yang masih bersifat manual dan mengandalkan pemantauan CCTV, sehingga dinilai kurang efisien, tidak akurat, serta menyulitkan proses rekapitulasi kehadiran dan lembur karyawan. Metode penelitian yang digunakan adalah Research and Development (R&D) dengan model pengembangan ADDIE, yang meliputi tahapan analisis, desain, pengembangan, implementasi, dan evaluasi. Teknik pengumpulan data dilakukan melalui observasi, wawancara, kuesioner pra-riset, serta studi dokumentasi. Hasil penelitian menunjukkan bahwa aplikasi presensi digital berbasis AppSheet yang dikembangkan mampu mencatat kehadiran karyawan secara real time, otomatis, dan terintegrasi dengan database berbasis cloud. Aplikasi ini juga mempermudah proses monitoring kehadiran oleh admin serta meningkatkan kerapihan dan akurasi data presensi. Berdasarkan hasil uji coba terbatas,

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
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sistem presensi digital dinilai layak digunakan dan efektif dalam meningkatkan efisiensi administrasi kehadiran karyawan di PT XYZ.
Kata kunci: AppSheet, Pengembangan aplikasi, Presensi, Quick response codes

INTRODUCTION

Rapid technological advancement has significantly transformed organizational work patterns and administrative systems. In human resource management, employee attendance is a fundamental element that supports work discipline, operational efficiency, and managerial decision-making (Khairunnisa et al., 2023). Accurate and real-time attendance records are essential to minimize administrative errors and ensure transparency in workforce management (Sonny & Rizki, 2021). However, many newly established companies still rely on manual attendance monitoring, such as CCTV observation and written reports, which are inefficient and prone to inaccuracies. This condition highlights the importance of developing a digital attendance system that is practical, reliable, and suitable for organizations in the early stages of digital transformation.

This research was conducted at PT XYZ, a branch office operating in the transportation and logistics sector. Although the company employs a relatively small number of workers, it requires a structured attendance system to support administrative order and future organizational growth. The object of this study is the employee attendance process, while the scope of the research focuses on the development of a QR Code–based digital attendance system using the AppSheet platform. The system is designed to record employee check-in and check-out times, GPS-based locations, photo evidence, and attendance recapitulation automatically, both for office-based and field employees.

Recent studies indicate that the application of information technology in attendance management can significantly improve efficiency, accuracy, and data reliability. Digital attendance systems reduce manual recording errors and simplify administrative processes (Anggen & Sarjana, 2023). Furthermore, AppSheet has been identified as an effective no-code platform that enables users to develop data-driven applications quickly without complex programming skills, making it suitable for organizations with limited technical resources (Elisa et al., 2022). QR Code–based attendance systems also support real-time data collection and flexible work environments, particularly for employees with high mobility (Feroze & Ali, 2024).

Although previous research has demonstrated the effectiveness of digital attendance systems, most studies focus on large organizations with established digital infrastructure. These systems are often complex and less applicable to small or newly established companies that still rely on manual attendance monitoring. As a result, prior studies have not fully addressed the challenges faced by organizations with limited resources, such as difficulties in real-time monitoring, data recapitulation, and attendance accuracy.

The current state of the art in attendance system development emphasizes real-time data recording, system integration, mobility support, and user-friendly interfaces. This research adopts these principles by developing a QR Code–based attendance system using AppSheet, which allows automatic data storage, real-time monitoring, and mobile accessibility. The system is designed to accommodate both office-based and field employees, addressing the limitations of conventional CCTV-based attendance monitoring.

The purpose of this research is to develop a standardized digital attendance system that enhances efficiency, accuracy, and organization in employee attendance management at PT XYZ. The novelty of this study lies in its focus on a company that previously had no formal attendance system and relied solely on manual and visual monitoring. By utilizing a low-code platform, this research offers a cost-effective, easily implementable solution suitable for small and developing organizations. The findings contribute practically by providing a feasible

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
DOI: https://doi.org/10.21009/jpepa.0603.05

model for digital attendance implementation and theoretically by enriching the literature on attendance system development in organizations with limited digital infrastructure.

LITERATURE REVIEW

Digital Attendance Systems

A digital attendance system is an information system designed to record, store, and manage employee attendance data electronically. Attendance management plays a vital role in human resource administration, as it supports discipline evaluation, working hour calculation, and organizational decision-making. Conventional attendance systems that rely on manual records or visual supervision are prone to human error, data inconsistency, and inefficiency. Several studies indicate that digital attendance systems significantly improve data accuracy and administrative efficiency by automating attendance recording and minimizing manual intervention (Kurniadi et al., 2022; Rahmatuloh et al., 2023). The implementation of digital attendance systems also enables real-time monitoring and structured data storage, which enhances transparency and accountability within organizations.

QR Code Based Attendance

Quick Response (QR) Code technology has been widely adopted in attendance systems due to its simplicity, low cost, and ease of use. QR Codes function as digital identifiers that allow users to record attendance by scanning codes using mobile devices. Previous research shows that QR Code based attendance systems can reduce attendance fraud and accelerate the check-in and check-out process compared to traditional methods (Elisa et al., 2022). Additionally, QR Code technology minimizes physical contact and does not require specialized hardware, making it suitable for organizations with limited resources (Zulaiha & Usman, 2023). The flexibility and efficiency of QR Code based systems contribute to their increasing adoption across various organizational sectors.

No Code Application Development

No code application development platforms enable users to build functional applications without extensive programming knowledge. These platforms provide visual interfaces and pre built components that simplify application design and deployment. Research indicates that no code platforms support rapid system development and reduce dependency on professional developers, thereby lowering development costs and time (Mendix, 2022). In organizational contexts, no code platforms are particularly beneficial for small and medium sized enterprises that require practical digital solutions but lack technical expertise. The use of no code tools also encourages innovation and adaptability in information system development.

AppSheet as an Attendance System Platform

AppSheet is a no code application development platform that allows users to create mobile and web based applications integrated with cloud based data sources. Several studies have demonstrated the effectiveness of AppSheet in developing administrative and attendance systems due to its ease of use, real time data synchronization, and compatibility with spreadsheet based databases (Putra et al., 2023). AppSheet enables organizations to manage attendance data efficiently while providing administrators with real time access to attendance records. Its flexibility and scalability make AppSheet a suitable platform for developing digital attendance systems in organizations with limited technological infrastructure.

ADDIE Model Development

The ADDIE model is a structured and systematic approach used to produce effective

and appropriate products. This model is not only applied in instructional media development but is also widely implemented in curriculum design, digital systems, modules, and training programs due to its flexibility and broad applicability. ADDIE is often regarded as a fundamental framework in instructional and system design because it emphasizes continuous evaluation and improvement throughout the development process (Ade, 2025). According to Shaquille and Parga (2023), the ADDIE model consists of five main stages, namely Analysis, Design, Development, Implementation, and Evaluation, which reflect a structured development process. Furthermore, Wicaksono et al. (2025) state that the ADDIE method is commonly used by developers to design systems or media through an integrated process that supports performance improvement. In this research, the ADDIE model is applied as the development framework for a digital attendance application based on AppSheet at PT XYZ. The use of this model enables a systematic development process through its five stages, allowing continuous evaluation and refinement to ensure that the resulting attendance system is efficient, user-friendly, and aligned with the company's operational needs.

METHOD

This research employed the Research and Development (R&D) method with the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. The ADDIE model was selected because it provides a systematic and flexible framework suitable for developing digital systems aligned with user needs. This approach is considered appropriate for the development of a digital attendance application based on AppSheet at PT XYZ, particularly for organizations that are still in the early stages of digital transformation.

The first stage is Analysis. This stage aims to identify problems in the existing attendance process and determine appropriate solutions based on user needs. Observations were conducted to examine the attendance system at PT XYZ, which was still carried out through CCTV monitoring and manual reports. Interviews with administrative staff and employees were also conducted to identify issues such as difficulties in data recap, delays in attendance reporting, and limited transparency. The results of this stage were used to define system requirements and functional specifications. The second stage is Design. This stage focuses on designing the system workflow and preparing supporting documents for the development stage. The researcher designed the application interface, navigation flow, and data structure using AppSheet integrated with Google Spreadsheet as the database. The third stage is Development. This stage involves developing the digital attendance application based on the prepared design. The application was built using the AppSheet platform and integrated with QR Code technology for check-in and check-out processes. Functional testing was conducted to ensure that each feature operated according to the design specifications.

The fourth stage is Implementation. This stage was carried out by applying the developed attendance application in the real working environment of PT XYZ. Employees used the application to record daily attendance through mobile devices, while administrators monitored attendance data through the dashboard. The final stage is Evaluation. Evaluation was conducted using questionnaires distributed to users and expert validators. Quantitative data were analyzed using a Likert scale and converted into percentage values to determine feasibility levels, while qualitative feedback was used for system refinement. The assessment of the developed AppSheet-based attendance application was conducted using structured evaluation instruments to obtain reliable and measurable data. Both qualitative and quantitative data were collected to support the evaluation of the system's feasibility. The use of appropriate instruments and data collection techniques is essential to ensure accurate and trustworthy research results (Ardiansyah et al., 2023). Attendance Application System Flow can be shown Figure 1.

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
DOI: https://doi.org/10.21009/jpepa.0603.05

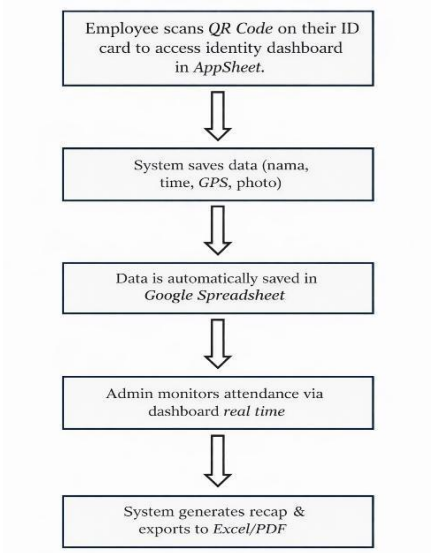

Figure 1. Attendance Application System Flow

Table 1. Likert Scale Answer Score

Answer	Score
Strongly disagree	1
Disagree	2
Neutral	3
Agree	4
Strongly Agree	5

Source: (Sugiyono, 2023)

Table 1 presents the scoring rubric used to measure expert validation and user responses using a five-point Likert scale. The scale ranges from 1 to 5, representing Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree. This scoring system was applied to evaluate the usability, functionality, and visual communication aspects of the developed attendance application. The use of a Likert scale allows respondents to express their level of agreement clearly and provides quantitative data that can be analyzed objectively to determine the feasibility of the system (Sugiyono, 2023). After the data was collected, the percentage of feasibility was calculated using the following formula:

$$\text{Feasibility Percentage (\%)} = \frac{\text{Observed Score}}{\text{Expected Score}} \times 100\%$$

Figure 2. Feasibility Percentage Calculation
Source: (Izzati, 2024)

The scores obtained from the validation process were then converted into percentage values to determine the level of feasibility of the application. Table 2 shows the eligibility percentage categories used as a reference for interpretation. A score of 81% – 100% indicates that the application is highly eligible. Scores of 61%–80% are categorized as eligible, 41% – 60% as moderately eligible, 21% – 40% as ineligible, and 0% – 20% as highly ineligible. This classification is commonly used to assess product feasibility in research and development studies (Kusuma and Mahardi, 2021).

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
DOI: https://doi.org/10.21009/jpepa.0603.05

Table 2. Category Eligibility Percentage

Category Percentage	Percentage
Highly Eligible	81% - 100%
Eligible	61% - 80%
Moderately Eligible	41% - 60%
Ineligible	21% - 40%
Highly Ineligible	0% - 20%

Source: (Kusuma & Mahardi, 2021)

RESULTS AND DISCUSSION

Results

This research used the Research and Development (R&D) method with the aim of producing and testing the feasibility of an AppSheet-based Employee Attendance Application. The R&D method was applied through the stages of design, development, and implementation to ensure that the system was in line with the operational needs of users and was feasible for use. The employee attendance application was developed using AppSheet, which is integrated with Google Spreadsheet as the main database to replace manual attendance with a more efficient, accurate, and real-time digital system. The application can be accessed via the web as well as Android and iOS devices, with the attendance process using QR (The attendance dashboard can be seen in Figure 3). Code scanning as employee identification, photo capture as proof of attendance, GPS location recording, and automatic time recording that cannot be manipulated.

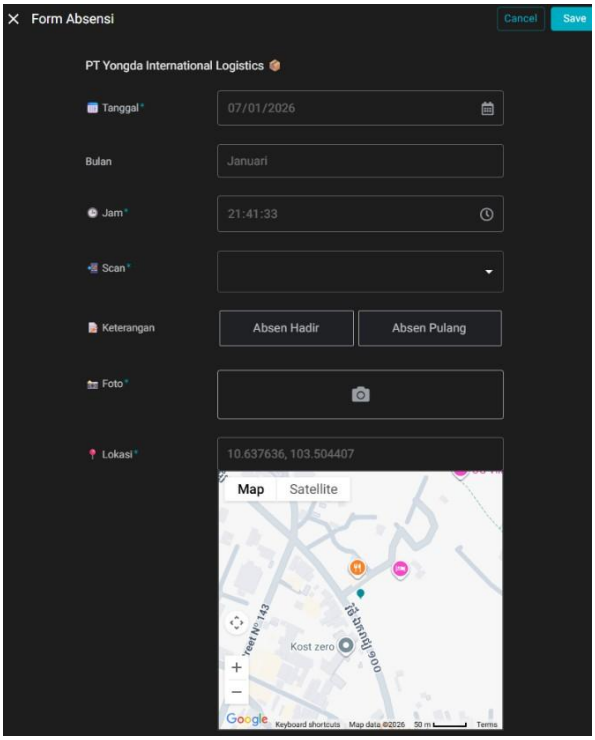

Figure 3. Attendance Dashboard

All attendance data is automatically stored in Google Spreadsheets and can be monitored in real time through the admin dashboard in the form of tables and graphs, and exported to Excel and PDF formats for monitoring and reporting purposes. The attendance results dashboard serves as a tool for administrators to monitor employee attendance in real

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
DOI: https://doi.org/10.21009/jpepa.0603.05

time (Figure 4). The dashboard displays attendance data stored in Google Spreadsheets in the form of tables and graphs, making it easy for administrators to view and analyze employee attendance data.

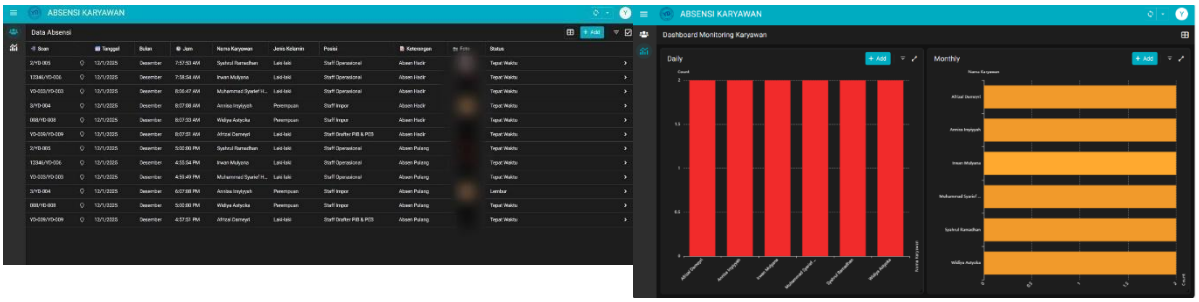

Figure 4. Employee Monitoring Dashboard

The information displayed includes employee identity, date and time of attendance, attendance status, location of attendance, and photos as proof of attendance. The data is automatically updated every time attendance is recorded, so that the monitoring process can be carried out without manual input. In addition, the dashboard provides attendance summaries per period and a data export feature to Excel and PDF formats to support administrative and reporting needs.

User Acceptance Test Results

Based on the results of the user feasibility questionnaire, as can be seen in Table 3, a total score of 221 out of a maximum score of 245 was obtained, resulting in a feasibility percentage of 90.20%. This indicates that respondents gave very positive assessments of the AppSheet based attendance application developed. All evaluation indicators scored above 90%, showing that the application meets the aspects of ease of use, smooth attendance processes, accurate attendance recording, and proper management of employee attendance data.

Table 3. User Acceptance Test Results

Statement	Total Score	Expected Score	Average	Percentage
Easy-to-use application	33	35	4,7	94,29%
Fast QR code scanning	30	35	4,2	85,71%
GPS and photo functions	30	35	4,2	85,71%
Accurate attendance times	30	35	4,2	85,71%
Neat attendance data	34	35	4,8	97,14%
Easier attendance tracking	31	35	4,4	88,57%
Worth using application	33	35	4,7	94,29%
Number	221	245	31,1	90,20%
Average Score				90%

According to the feasibility assessment criteria in Table 4, a percentage of 90.20% falls into the **"**Very Feasible**"** category. Therefore, the AppSheet based attendance application is considered suitable for use as an employee attendance system at PT XYZ. Overall, the User Acceptance Testing results show that the application is well accepted by users and is able to improve the effectiveness and efficiency of employee attendance recording and monitoring. The results of the evaluation conducted by the media expert show a feasibility percentage score of 100% for the Usability aspect, 90% for the Functionality aspect, and 90% for the Visual Communication aspect. Based on these results, the average feasibility percentage obtained is 93%. Referring to the feasibility criteria, the QR Code based Employee Attendance Application developed using AppSheet falls into the "Very Feasible" category for use.

Table 4. Analysis of Assessment by Media Experts

Assessment Aspect	Number of Items	Score for Each Aspect	Expected Score	Percentage of Eligibility
Usability	4	20	20	100%
Functionality	6	27	30	90%
Visual Communication	4	18	20	90%
Total	14	65	70	92,86%
Mean				93%

Furthermore, the following section presents the results of the assessment conducted by the second media expert. This evaluation was carried out to obtain additional insights into the feasibility level of the Employee Attendance Application from another media expert's perspective. The results of this assessment are presented in the following table as supporting data for the application feasibility analysis.

Discussion

The findings of this study demonstrate that the AppSheet-based attendance application effectively addresses the limitations of manual attendance systems, particularly in terms of efficiency, accuracy, and data management. The integration of QR Code scanning, GPS-based location tracking, automatic time recording, and photo documentation enables real-time and reliable attendance recording. These results are in line with previous studies which emphasize that digital attendance systems significantly reduce human error and improve administrative efficiency through automation (Ardebili et al., 2023). In addition, the ability of the system to provide centralized and real-time data supports transparency and enhances managerial decision-making, confirming the argument of Sonny and Rizki (2021) that accurate attendance data is essential for organizational discipline and operational effectiveness. The high feasibility score from users (90.20%) further indicates that the system not only performs technically well but also meets user expectations in practical contexts.

The implementation of QR Code technology in this study also reinforces findings from earlier research that highlights its practicality, low cost, and effectiveness in simplifying attendance processes. The relatively high scores in indicators such as ease of use, data accuracy, and monitoring convenience suggest that QR Code-based systems provide a user-friendly solution suitable for organizations with limited technological infrastructure. This finding supports Elisa et al. (2022), who state that QR Code technology can accelerate attendance recording and minimize fraudulent practices compared to conventional systems. Furthermore, the flexibility of the system, particularly its compatibility with mobile devices and its ability to support both office-based and field employees, aligns with Feroze and Ali (2024), who emphasize the importance of flexible and real-time attendance solutions in modern work environments. The presence of features such as automatic data updates and dashboard-based monitoring also strengthens the system's role in facilitating continuous supervision without requiring manual intervention.

In addition, the use of AppSheet as a no-code development platform proves to be an effective approach for developing digital solutions in organizations with limited technical resources. This finding is consistent with the study by Mendix Research Group (2022), which highlights that no-code platforms enable rapid application development while reducing reliance on specialized programming skills. Similarly, Putra et al. (2023) found that AppSheet supports efficient data integration and real-time monitoring, which is reflected in this study through the use of Google Spreadsheet as a cloud-based database and the availability of interactive dashboards. The successful application of the ADDIE model in this research also confirms its relevance as a systematic framework for product development beyond instructional design contexts, as suggested by Wicaksono et al. (2025). Moreover,

Jurnal Pendidikan Ekonomi, Perkantoran, dan Akuntansi, 6 (3), December 2025: 476 – 485
DOI: https://doi.org/10.21009/jpepa.0603.05

this study contributes to the existing literature by demonstrating that digital attendance systems can be effectively implemented in small-scale organizations that are still in the early stages of digital transformation, thereby addressing the gap in previous studies that predominantly focus on large organizations with more advanced technological infrastructure.

CONCLUSION AND RECOMMENDATION

This study concludes that the development of an employee attendance application based on AppSheet integrated with QR Code technology has been successfully implemented and meets the research objectives. The application is able to support digital attendance recording through check-in and check-out features, GPS-based location tracking, photo evidence, and real-time monitoring via dashboards. The implementation results indicate that the application functions properly in real working conditions and can be effectively used by employees and human resource administrators. User Acceptance Testing results show a feasibility percentage of 90.20%, categorized as Very Feasible, indicating high user acceptance in terms of usability, accuracy, and ease of use. In addition, expert validation results from two media experts show feasibility percentages of 93% and 91%, both classified as Very Feasible, confirming that the application meets usability, functionality, and visual communication standards. Overall, the AppSheet-based employee attendance application is considered feasible for implementation at PT XYZ and is able to improve the effectiveness and efficiency of attendance management while supporting more structured and integrated data processing.

Based on the research findings, several recommendations are proposed for future development. First, the application should be enhanced with offline attendance capabilities to ensure continuous operation during unstable internet connections. Second, additional features such as leave, permission, and overtime management are recommended to create a more comprehensive attendance system. Third, future studies should involve a larger number of users to obtain more representative evaluation results. Furthermore, improving dashboard visualization is suggested to provide more informative and analytical attendance reports. These improvements are expected to enhance the functionality and scalability of the application for broader organizational use.

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