

Development of Attendance Information System For Teacher Attendance at Pertiwi Elementary School Bandung

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Received 08 January 2024 | Revised 30 April 2024 | Accepted 21 May 2024

ABSTRACT

The advancement of technology particularly in telecommunications, has led to the creation of various software applications that are beneficial to human life. One such application is modern attendance management systems. The objective of this research is to construct and implement a QR-code-based attendance information system for teachers and staff at SD Pertiwi Kota Bandung. The research methodology comprises socialization, counseling, implementation, and monitoring and evaluation. The responses indicate that the application has met or exceeded user expectations in terms of functionality and accessibility. Of the respondents, 30.74% gave "Normal" responses, 41.85% gave "Baik" responses, and 27.41% gave "Sangat Baik" responses. Additionally, the responses from program partners, SD Pertiwi, Bandung City, indicate positive evaluation and feedback.. The results of this development are intended to improve the accuracy of the attendance process, facilitate teachers and staff in reporting attendance, and minimize fraud and human error.

Keywords: attendance, qr-code, teacher, staff

1. INTRODUCTION

The rapid development of technology in the current era requires humans to coexist with information and technology **(Subandowo, 2022) (Suryadi, 2019)**. Information and technology can facilitate and solve problems around us **(Faruqi, 2019)**. To ensure the quality, accuracy, and speed of information, the information must be easily accessible to various interested parties. One of the important developments in information technology is the increasing need for data processing tools to produce the necessary information. The computer is an efficient data processing tool that can be used in all areas of the company or institution, especially in essential areas supporting the institution's goals **(Pramitha, 2017)**. One of them is attendance management.

Many businesses, including schools, companies, and other institutions, need attendance control. An efficient and accurate attendance system is required to ensure the presence of teachers and staff for certain activities or processes **(Subiantoro & Sardiarinto, 2018) (Triyono et al., 2018)**. However, conventional attendance systems can cause problems such as possible manipulation, data loss, and time-consuming processes **(Mus & Mustafa, 2021)**

(Permana et al., 2021). The right technology is needed to overcome these problems, namely QR-Code (Quick Response Code) technology.

QR-Code is an important instrument in meeting these needs, especially in attendance management, and can be accessed easily using mobile devices or cameras commonly owned by many people **(Susianto et al., 2022) (Herlina & Hidayatullah, 2017)**. This technology is the solution that we offer to the community in need.

The solution focuses on Pratiwi Elementary School in Bandung City to design and implement an attendance system workflow based on the existing teacher attendance system at the school, which is currently considered inefficient. In addition, we will create a system that utilizes QR code technology. By improving teacher attendance management, we aim to reduce problems such as attendance manipulation, data loss, and time-consuming attendance processes.

2. ACTIVITY IMPLEMENTATION METHODS

The activity's implementation method consists of two stages: socialization and implementation, followed by training on operating the attendance application.

2.1 Socialization

During the socialization phase as shown in figure 1, the objective is to provide participants with an understanding of the importance of digitizing teacher attendance in the school information system. This understanding explains the benefits and positive impacts of using QR code technology to manage teacher and staff attendance at Pratiwi Elementary School in Bandung City.



Figure 1. Socialization with a Principal of Pertiwi Elementary School Bandung City

Through this socialization stage, participants can thoroughly understand the concept and benefits of using QR code technology to optimize the teacher attendance system at Pratiwi Elementary School in Bandung City.

2.2 Counseling

At this stage, counseling was conducted to prepare teachers and staff to implement the QR-code attendance system at SD Pertiwi Kota Bandung. Participants received a comprehensive understanding of the benefits of QR-code technology in attendance management, focusing on the steps for using the application. Counseling sessions included practical demonstrations, case studies, and interactive discussions to address potential barriers. The ultimate objective is to

mentally and practically prepare participants to adopt changes in the attendance administration process. Figure 2 shows material regarding the attendance application.



Figure 2. Material Regarding the Attendance Application

2.3 Implementation

The implementation phase involves installing a QR-code attendance system at SD Pertiwi Kota Bandung. Practical instructions were given to teachers and staff for registration, attendance reporting, and prevention of data manipulation. Hands-on training was conducted to ensure users can quickly adopt QR-code technology. The objective is to enhance user proficiency using the application, streamline processes, and minimize errors.

2.4 Monitoring and Evaluation

The final stage of implementing the QR Code-based attendance system is the monitoring and evaluation phase, which involves reviewing the application's performance. The monitoring process begins during the implementation and counseling stages, focusing on the system's functionality and effectiveness. During monitoring, attendance data entered into the database is regularly checked to ensure the application accurately records teacher and staff attendance. Evaluation involves comparing the results with the initial objectives and taking inputs from users and related parties. This process also includes analyzing the app's impact on administrative efficiency at SD Pertiwi Kota Bandung. The monitoring and evaluation stage results form the basis for continuous improvement and refinement of the application showed in figure 3.



Figure 3. Monitoring and Evaluation

3. RESULT AND DISCUSSION

After submitting the attendance application materials, the principal requested a specific format for the application. Our team then created the application according to their specifications. The following is a view of the application.



Figure 4. Sign In Page

Figure 4 shows the sign-in page of the mobile attendance application, which is designed with various important elements to facilitate user sign-in. Users are required to fill in the input form, including fields for email and password. Other elements, such as the option to display the password, the option to reset the password, and the sign-in button, are also included. If successful, the user will be directed to the home page, as shown in Figure 5. The design was created to provide an intuitive and user-friendly experience for app users.



Figure 5. Home Page

On the home page as shown in Figure 5 displays several feature icons these include barcode scanning which is useful for scanning barcodes using a camera as shown in Figure 6, attendance which is useful for displaying attendance barcodes that will update every specified time as shown in Figure 7, attendance list which is useful for displaying attendance lists as shown in Figure 8, and admin which is useful for monitoring and managing attendance as shown in Figure 9.



Figure 6. Scan Barcode Page

Figure 6 shows the Scan Barcode page which enables users to perform the attendance process by scanning the barcode. The application uses the user's smartphone camera to read the barcode generated by the system. If the scanned barcode matches the system-generated barcode, the system recognizes that the user has successfully taken attendance, and the information is recorded in the database. However, if the scanned barcode does not match, the system will recognize that the user has failed to take attendance, and the data will not be recorded in the database.



Figure 7. Generate QR-Code Page

Figure 7 displays the Generate QR-Code page, which automatically generates QR-Codes for attendance purposes. The automatic generation process takes one minute and is designed to prevent cheating in the attendance system. By changing the QR-Code every minute, users cannot share the code with others. This page includes a back button on the Application Bar for easy navigation back to the home screen.



Figure 8. List Presensi Page

Figure 8 shows the Attendance List Page, which monitors user attendance. The List View displays a 'Name' column with a list of teachers and staff, and a 'Status' column with their attendance status (Present or Absent). There is also a back button on the Application Bar that allows users to navigate back to the home screen.



Figure 9. Admin Page

On the Admin Page as shown in Figure 9, administrators can manually mark attendance by toggling the button. Toggling the button changes the status to 'Present' or 'Absent' depending on its position 'on' or 'off'. The Name column displays a list of teachers and staff. The App Bar includes a back button to navigate to the home screen.

The wishes of SD Pertiwi Kota Bandung are fulfilled by creating this attendance application for teachers and staff. Every teacher and staff can now easily take attendance using a QR Code, and attendance data is automatically recorded. With this application, the objectives of SD Pertiwi Kota Bandung have been successfully achieved. This application supports the school's main mission: to create honest people.



Figure 10. Active Participation of the Principal and Administration Team and the Team from Institut Teknologi Nasional Bandung

Figure 10 shows the active participation of the principal and administrative team of SD Pertiwi Kota Bandung and the team from the Bandung National Institute of Technology in using this attendance application.

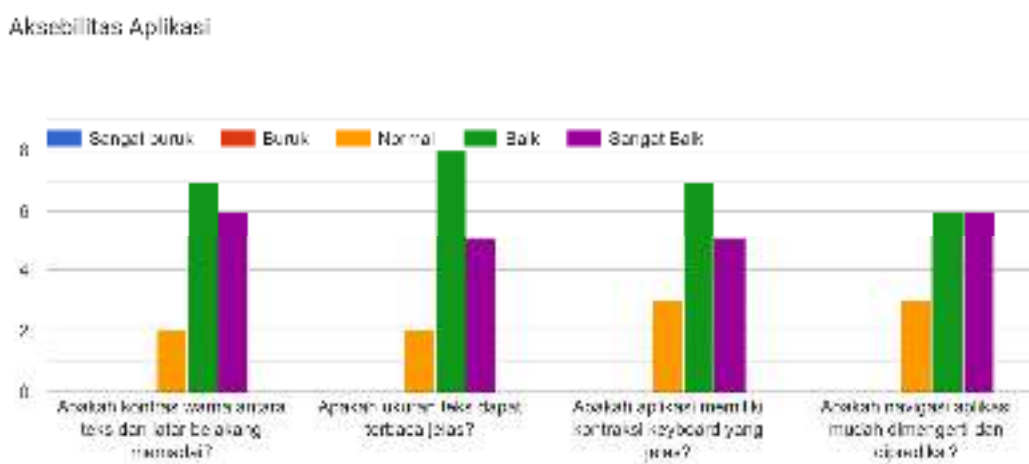


Figure 11. Accessibility Testing

Figure 11 presents the test results of this application, which highlight the accessibility aspect as being of great importance to users. The data collected indicates that some respondents gave a response of "Normal," indicating that there are certain areas of accessibility that require improvement. In contrast, the majority of respondents gave a response of "Baik," indicating that the app already provides decent accessibility for the majority of users. Moreover, the "Sangat Baik" response provided by some respondents indicates that the app has performed exceedingly well in terms of accessibility, meeting or even exceeding the expectations of the users. Figure 11 provides a clear illustration of the necessary improvements to enhance the accessibility of the app, ensuring an inclusive and satisfactory experience for all users.

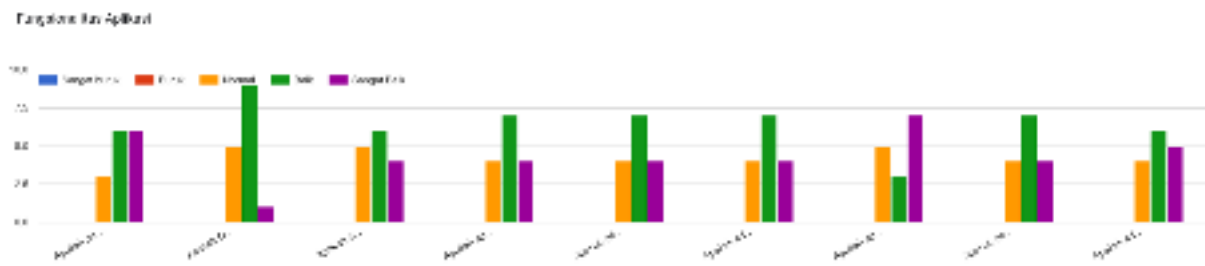


Figure 12. Functionality Testing

In Figure 12, the explanation of the functionality of the application is the primary focus of attention. The data collected from the test highlighted several important aspects related to the performance of the app. From the results of this test, it can be seen that some respondents gave a "Normal" response, indicating that there are certain areas of functionality that need to be fixed or improved. However, the majority of respondents indicated that the app met their expectations in terms of functionality, with the majority of respondents rating the app as "Baik." Additionally, a small number of respondents rated the app as "Sangat Baik," indicating that the app has performed well in terms of functionality, providing a satisfying and efficient experience for users. Figure 12 provides a comprehensive overview of the app's functional quality and performance, offering valuable insights for further development and improvement.

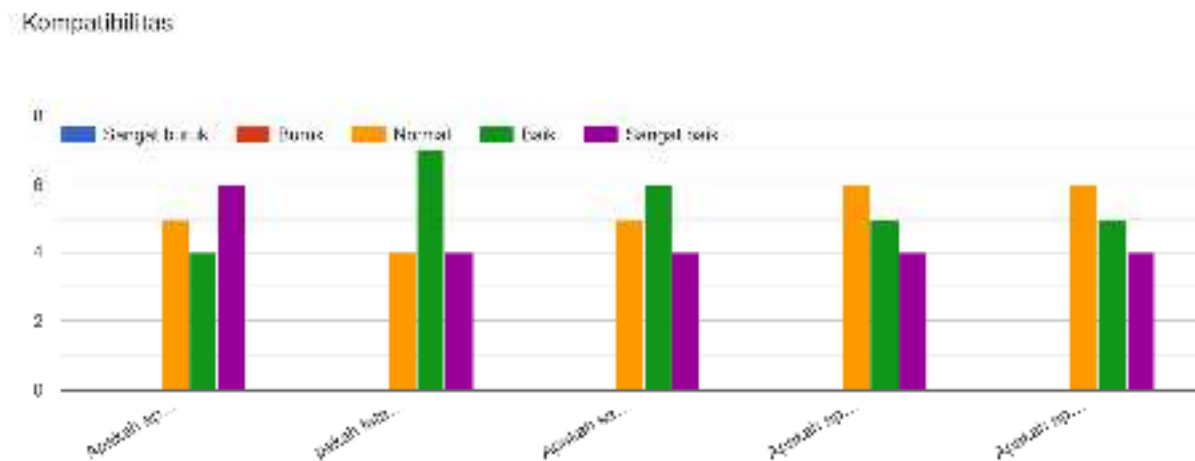


Figure 13. Compatibility Testing

Figure 13 provides an explanation of the application compatibility test. The primary objective of this test is to ascertain that the application functions properly and consistently in a variety of different environments. The results of this test indicate that some respondents provided a "Normal" response, suggesting that certain constraints or incompatibilities exist on certain platforms that require further attention. However, the majority of respondents indicated that the app was compatible with the majority of the environments tested, with the majority of responses being "Baik." Some respondents indicated that the app performed exceptionally well in terms of compatibility, providing a consistent and enjoyable experience.

The results of the application test activity on 15 respondents indicated that the majority of respondents provided a positive response to the application. Of the 18 questions asked, approximately 30.74% of respondents considered the application to be "Normal," suggesting that there is room for improvement. Meanwhile, approximately 41.85% of respondents provided a "Baik" response, indicating that the application has received a positive response

and satisfied most users. Furthermore, approximately 27.41% of respondents rated the app as "Sangat Baik" indicating that the app has met or even exceeded user expectations in numerous respects. This summary provides a balanced view of the app's performance, highlighting areas that require further attention while also acknowledging the quality that has been provided to users.

4. CONCLUSIONS

The program "Development Of Attendance Information System As A Tool For Monitoring Teacher Attendance At Sd Pertiwi, Bandung City" has been successfully implemented. The team observed that the manual attendance process of teachers and staff was prone to human error in recording attendance, which led to the development of this application. The program was successfully tested with the program partner, SD Pertiwi, Bandung City. The principal and administrative team responded positively, and their evaluation will guide further improvements.

The implementation of this system improves attendance administration efficiency and gains active support from the school. The following steps require ongoing monitoring, evaluation of user feedback, and refinement to ensure that this application remains an effective tool for managing teacher attendance at SD Pertiwi in Bandung City.

After observing the test percentages, it can be concluded that the application has successfully achieved a positive response rate from users. With approximately 30.74% of respondents indicating a "Normal" response, approximately 41.85% indicating a "Baik" response, and approximately 27.41% indicating a "Sangat Baik" response, this demonstrates that the application has met or even exceeded user expectations in terms of functionality and accessibility. In light of the positive evaluation and feedback from the program partner, SD Pertiwi, Bandung City, the next steps should continue to prioritize monitoring and evaluating user responses, as well as identifying necessary improvements to ensure the continued effectiveness of this application in managing teacher attendance at the school.

ACKNOWLEDGEMENT

The Community Service program was made possible through collaboration with the principal of SD Pertiwi Kota Bandung, who was willing to work together. The Institut Teknologi Nasional Bandung provided support for the program in accordance with the agreement for the implementation of Community Service (PKM).

LIST OF REFERENCES

- Faruqi, U. A. (2019). Future Service In Industry 5.0. *Jurnal Sistem Cerdas*, 2(1), 67–79.
- Herlina, E., & Hidayatulloh, T. (2017). Penerapan Qr Code Untuk Sistem Absensi Siswa Smp Berbasis Web. *Jurnal Teknologi Dan Informasi*, 7(2).
- Mus, S., & Mustafa, M. (2021). Aplikasi Sistem Presensi Dosen Dan Mahasiswa Fakultas Ilmu Pendidikan Unm. *Edustudent: Jurnal Ilmiah Pendidikan Dan Pembelajaran*, 1(1).

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- Permana, A., Zulfikar, M., & Kusumadiarti, R. (2021). In *Jurnal Infokom | 14 Jurnal Informatika Dan Komputer*.
- Pramitha, D. (2017). Pergeseran Paradigma Sistem Informasi Manajemen. *J-Mpi (Jurnal Manajemen Pendidikan Islam)*, 2(1).
- Subandowo, M. (2022). Teknologi Pendidikan Di Era Society 5.0. *Jurnal Sagacious*, 9(1).
- Subiantoro, S., & Sardiarinto, S. (2018). Perancangan Sistem Absensi Pegawai Berbasis Web Studi Kasus : Kantor Kecamatan Purwodadi. *Swabumi*, 6(2), 184–189.
- Suryadi, S. (2019). Peranan Perkembangan Teknologi Informasi Dan Komunikasi Dalam Kegiatan Pembelajaran Dan Perkembangan Dunia Pendidikan. *Jurnal Informatika*, 3(3), 9–19.
- Susianto, D., Astika, R., & Syafitri, Y. (2022). Penerapan Qr Code Untuk Media Pelayanan Absensi Mahasiswa Amik Dian Cipta Cendikia. *Jurnal Informatika Upgris*, 8(1), 14–20.
- Triyono, T., Safitri, R., & Gunawan, T. (2018). Perancangan Sistem Informasi Absensi Guru Dan Staff Pada Smk Pancakarya Tangerang Berbasis Web. *Sensi Journal*, 4(2), 153–167.