

## Design of a Web-Based Lecturer Attendance Information System Using QR Codes at Muhammadiyah University of Jambi

Muhammad Ikhsan<sup>1\*</sup>, Helmina<sup>2</sup>

<sup>1</sup> Information Systems Department, Muhammadiyah University Jambi, Indonesia, <sup>2</sup> Informatics Department, Muhammadiyah University Jambi, Indonesia

<sup>1</sup>[akauikhsan@gmail.com](mailto:akauikhsan@gmail.com), <sup>2</sup>[baehelmina@gmail.com](mailto:baehelmina@gmail.com)



### \*Corresponding Author

#### Article History:

Submitted: 08-05-2024

Accepted: 11-05-2024

Published: 22-05-2024

#### Keywords:

Information Systems, Absent;  
Web; QR Code; PHP; MySQL

**Brilliance: Research of Artificial Intelligence** is licensed under a Creative Commons Attribution-NonCommercial 4.0 International (CC BY-NC 4.0).

### ABSTRACT

Information technology in the world today is developing very rapidly. This development has resulted in an information and communication system that has given birth to new innovations, one of which is online attendance using QR Code. Currently, lecturers' attendance control in teaching courses is still done manually, that is, lecturers sign absences according to the lecture schedule and courses given at the academy. Where there is a problem in this case, namely that they often forget to sign the lecturer's absence which has an impact on the lecturer's teaching honorarium. Because teaching honorarium is calculated based on the absence of control. Therefore, it is hoped that the implementation of web-based attendance using QR Code will make it easier for lecturers to take absences and help academics in recording lecturers' controlled absences which will be handed over to the finance department, thereby reducing the occurrence of errors in paying lecturers' teaching honorariums. The data collection method in this research is observation, interviews, documentation and questionnaires. System design uses DFD (Data Flow Diagram), as well as system design using HTML and PHP, while for databases using MySQL.

### INTRODUCTION

The development of science in various fields in the current era of globalization is occurring very rapidly, one of which is in the field of information and communication technology. The development of information technology which is becoming more sophisticated day by day requires us as the younger generation to keep up with developments so as not to be left behind by other countries, especially in the world of education. Information technology in educational institutions has an important role in supporting the teaching and learning process, a more organized administrative system, and ease of access. fast and accurate information. The success of an organization or agency cannot be separated from discipline. Information technology in the world today is developing very rapidly. Therefore, many aspects have changed in people's daily lives. Fast information technology is very helpful in doing many things. This development has resulted in an information and communication system that has given birth to various new innovation models, one of which is conducting online attendance using the Quick Response Code (QR Code). Currently, lecturer attendance control in teaching courses is still done manually, namely lecturers sign attendance according to the lecture schedule and courses given at the academy. Where there is a problem in this case is that lecturers often forget to sign absences, so they are considered absent which will have an impact on the lecturer's teaching honorarium. Because teaching honorarium will be paid according to the current manual attendance count in academics. In this way, many mistakes occur and are detrimental to lecturers. Therefore, it is hoped that the implementation of web-based attendance using a QR Code will make it easier for lecturers to take attendance and help the academic community in recording lecturers' controlled absences which will be submitted to the finance department, thereby reducing the occurrence of errors. in paying lecturers' teaching fees.

### LITERATURE REVIEW

Attendance is a document that records the attendance hours of each employee in a company or educational institution (Khairul et al., 2023) (Kurnialensya & Saputra, 2023) The web is a collection of various kinds of data in the form of images, sounds or videos that are connected and related to each other. (Ernawati, 2020) (Santoso et al., 2022) (Helmina, Akbar, et al., 2023) (Helmina, Santoso, et al., 2023) QR Code is a form of encryption of data that resembles a matrix arranged horizontally and vertically. With an arrangement like that, QR Codes are able to accommodate more and varied data than barcodes. (Murni & Sabaruddin, 2018) (Wulandari et al., 2021) (Januartika et al., 2023).



**METHOD**

**Types of research**

The type of research used by the author is Research and Development (R&D). (Okpatrioka, 2023) Research and Development research is a research method that produces a product (can be a model or design) and determines the effectiveness of the product.

The Research and Development method has steps in its research method, namely:



Figure 1. Research and Development Methods

1. Preliminary Study is the first step in carrying out a needs analysis. Needs analysis is obtained from observations, questionnaires, interviews and documentation with respondents.
2. Model development is a step in preparing a draft model carried out by developers in a forum attended by researchers, experts, practitioners and representatives of respondents.
3. Testing is the stage of final product trial results based on the effectiveness of the product.

**Research design**

The research design used is the waterfall method. (Abdul Wahid, 2020) (Normah et al., 2022) The waterfall method is software development where system design is carried out in a structured and systematic manner in accordance with the existing development cycle. The Waterfall method has seven stages in general, namely:

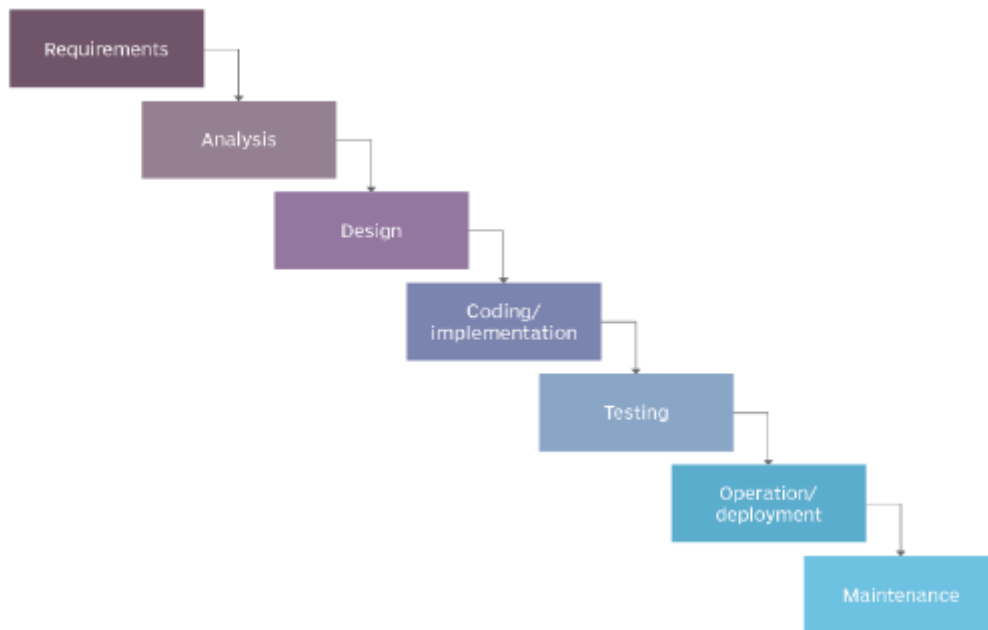


Figure 2. Waterfall Method

1. Requirements are an analysis process related to the system to be created.
2. Analysis, is a stage in analyzing the system that will be created, what are the shortcomings of the current system.
3. Design, is the process of building data structures, software architecture, interface design, internal and external function design as well as details of each procedural algorithm.
4. Coding/Implementation, is the stage of creating an application by a programmer using code from a programming language.
5. Testing is the testing stage of the application that has been created. The system will be verified to test its suitability.
6. Operation/deployment, is the stage at which the application is used and fully operational when run.
7. Maintenance is the stage of installing software and testing applications.

**Data Analysis and Collection Techniques**

The analysis technique used is PIECES analysis.(Anwardi et al., 2020)(Irji, 2020)(Septiani et al., 2023)(Oktaviani et al., 2022)PIECES analysis aims to correct and improve information systems in organizations. In analyzing a system, several important aspects are required such as system performance, information, economics, application security, efficiency and customer service. Data collection by conducting observations, interviews with sources, documentation, literature studies to complete the required data, and questionnaires to verify requirements for the system design. The following are the results of the analysis using the PIECES (Performance, Information, Economy, Control, Efficiency, Service) method carried out on the Lecturer Attendance system at Muhammadiyah University Jambi.

Table 1. PIECES analysis

Method	Old System	New System
<b>Performance</b>	Before entering class to start lectures, lecturers must go to the academic section first to sign the lecturer's absence	Lecturers open the lecturer attendance website and fill in the courses being taught, classes, study programs, lecture hours automatically. Then a QR Code will appear. And scan the Barcode.
<b>Information</b>	A recap must be done every month. Then submit it to the finance department as an ingredient in calculating the lecturer's teaching honorarium.	Lecturer absences are stored in a database, which can be accessed by academics and can be directly accessed by finance. And speed up the reporting.
<b>Economy</b>	Many lecturers do not have time to take absences from the academic department, which has an impact on the honorarium that lecturers receive. And a lot of paper is used, because absences have to be printed.	Reducing mismatches in lecturers' honorariums, because it is easier for lecturers to take attendance. And no more paper needed.
<b>Controls</b>	Absence is not guaranteed, the lecturer may leave the absence signed by someone else.	Data is guaranteed, because only lecturers who have been given their own accounts can enter.
<b>efficiency</b>	It takes time to record lecturer absences every month.	It doesn't take a long time to recap/report the lecturer's controlled absences.
<b>Service</b>	Lecturers must request a report from academics if they want to see a recap of lecture attendance that has been carried out	Lecturers only need to open the attendance system and view the report.

**RESULT**

The results of this research are the analysis and design of a web-based attendance information system using QR Code. The discussion is based on solutions related to the findings as follows:

**Contex Diagram**

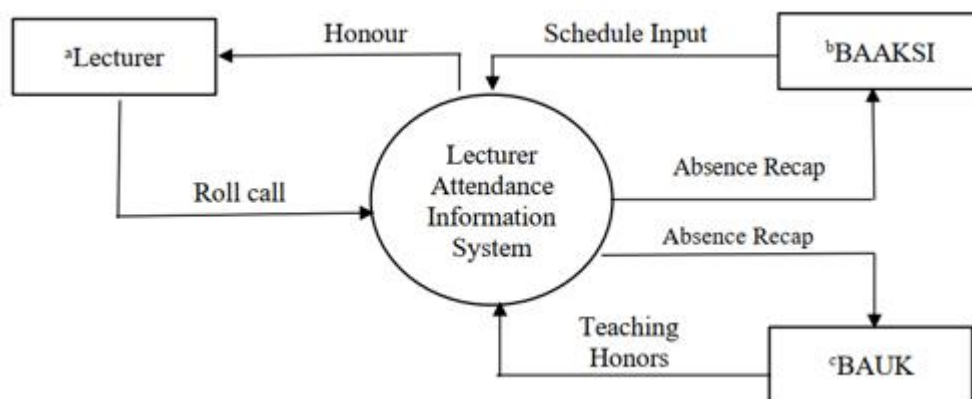


Figure 3. Context diagram for Lecturer Attendance Information System

**Image Caption 3 Contex Diagram**

The lecturer attendance system has three entities, namely Lecturers, Academic Section (BAAKSI) and Finance Section (BAUK).



Lecturer :Conduct absences and receive absence recap reports and total honorarium received  
 BAAKSI :Input lecture schedules and data. View and get a recap of lecturer absences  
 BAOK :Get lecturer attendance recaps, and provide information on lecturer honorariums

**Level 0 Charts**

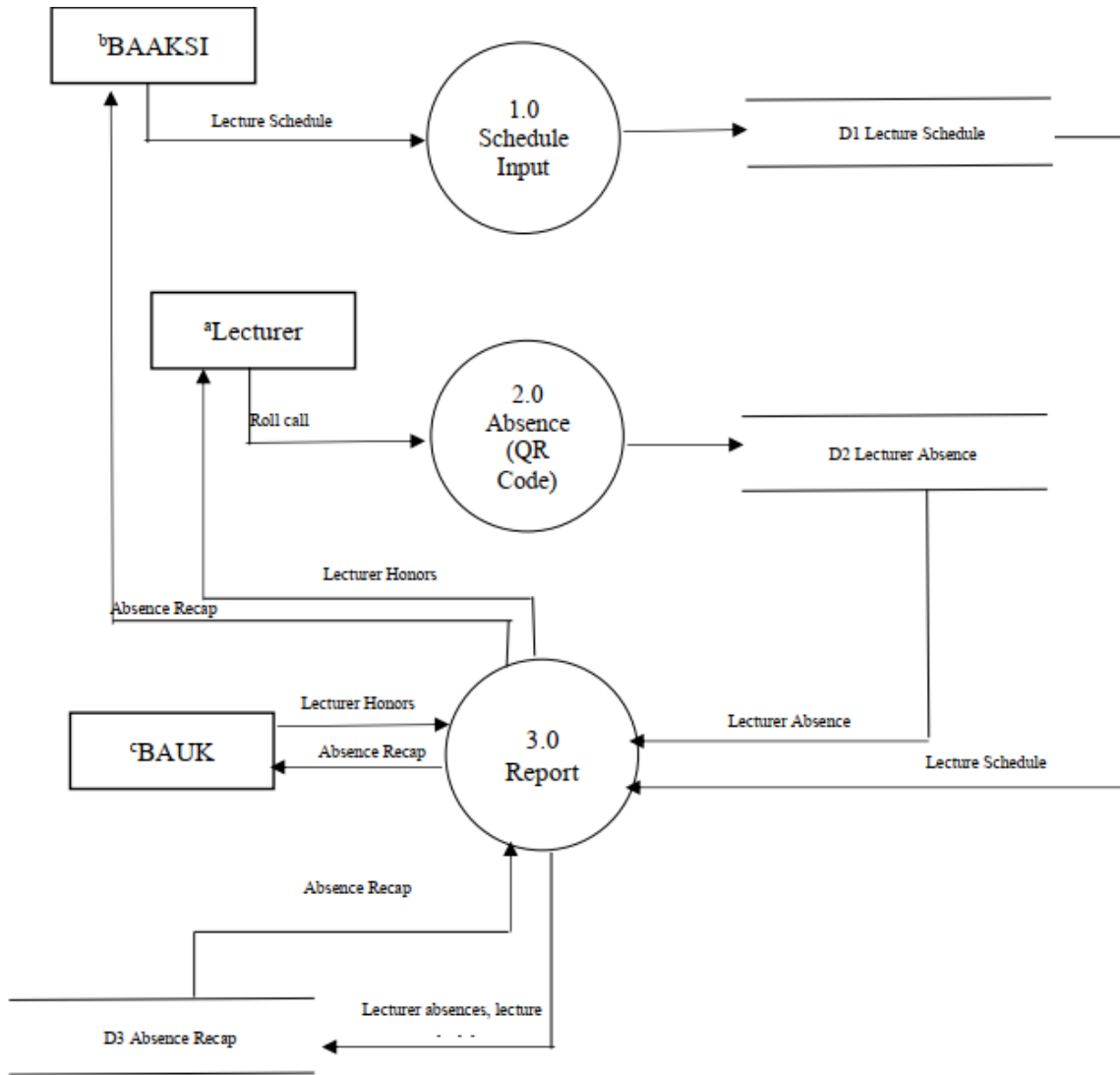


Figure 4. Level 0 Charts

Image caption 4. Level 0 diagram  
 Has 3 entities (Lecturer, BAAKSI and BAOK)  
 Have 3 Data Stores (Lecture schedule, Basen and Absence Recap)  
 Has 3 Processes (Schedule Input, Absence (QR Code), Report)  
 Have 12 Flow Diagrams that connect Entities, data stores and Processes.

**Qr Code Attendance Interface Display**

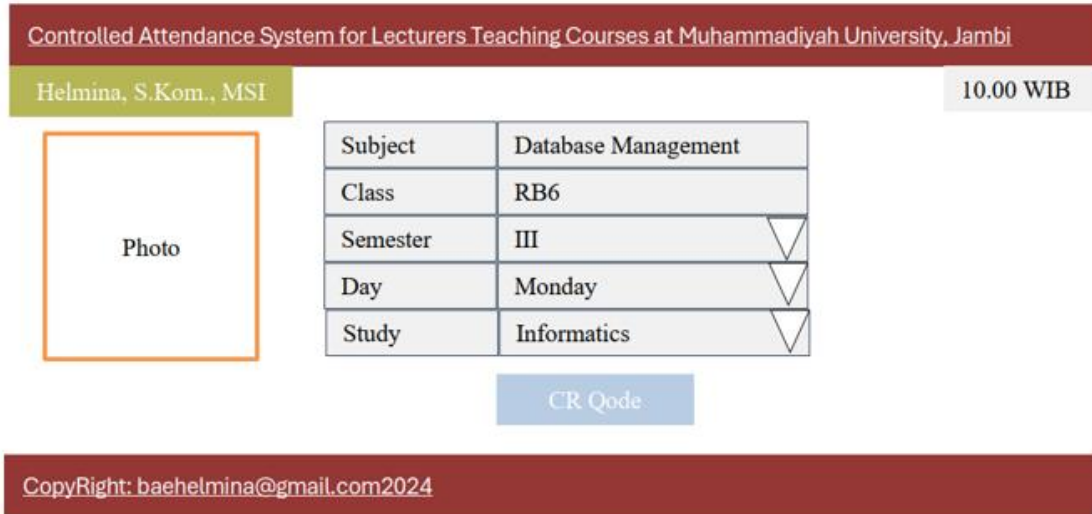


Figure 5. Course Data Input

**QR Code Interface Display**



Figure 6. QR Code display

**Display of scanning the QR Code and successful attendance on the Lecturer's Smart Phone**

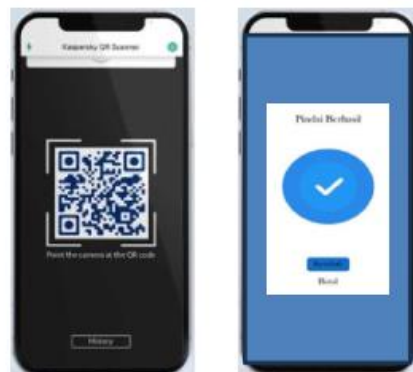


Figure 7. Successful Attendance

## DISCUSSION

From the experimental results it can be concluded that creating a lecturer attendance information system with a web-based QR Code can be implemented easily, in testing this system it involves three entities, namely lecturers, the BAAKSI section and the BAUK section. The system has input results that are in accordance with system requirements and this application has features which is easy to use. For further suggestions and improvements the system can be developed into a mobile-based application.

## CONCLUSION

The analysis in this research uses PIECES (Performance, Information, Economic, Control, Efficiency, Service) analysis to obtain the advantages and disadvantages of the old system, with this the author can provide a new system design that is more effective and efficient. The web-based attendance system interface screen design using QR Code was created with PHP and a MySQL database. The design of a web-based attendance information system using QR Code follows the user's system needs

## REFERENCES

- Abdul Wahid, A. (2020). Waterfall Method Analysis for Information Systems Development. *STMIK Journal of Informatics and Management Sciences*, November, 1–5.
- Anwardi, Anggi, R., Misra, H., Tengku, N., & Ekie, GP (2020). PIECES Analysis and the Influence of Fikri Karya Gemilang Website Design on Promotion Systems Using the Waterfall Model. *Journal of Systems Engineering & Industry (JRSI)*, 7(1), 57–65. <https://jr.si.sie.telkomuniversity.ac.id/JRSI/article/view/380>
- Ernawati, S. (2020). Pieces Analysis for the Design and Development of a Web-Based Inventory Monitoring Information System at the Sartika Bogor Cooperative. *EVOLUTION : Journal of Science and Management*, 8(1), 18–28. <https://doi.org/10.31294/evolution.v8i1.7386>
- Helmina, Akbar, Z., Ikhsan, M., Dani, R., & Amandha, S. (2023). Analysis and design of website-based hospital management information system applications. *Mantic Journal*, 7(2), 2685–4236.
- Helmina, H., Santoso, H., Nurdin, N., & Ikhsan, M. (2023). Designing a Website-Based Lecturer Evaluation System by Students (Edom) at Muhammadiyah University of Jambi. *Journal of Informatics, Information Systems and Forestry (FORSINTA)*, 2(1), 14–20. <https://doi.org/10.53978/jfsa.v2i1.263>
- Irji, MMR (2020). PIECES Method in Analyzing Goods Tracking Management Information Systems. *DYNAMIC Journal*, 17(2), 33–39.
- Januartika, C., Rosmiati, R., & Sartana, S. (2023). Analysis and Design of a Web-Based Attendance Information System Using QR Code Case Study: STMIK Palangkaraya. *Journal of Information Systems, Management and Information Technology*, 1(1), 29–36. <https://doi.org/10.33020/jsimtek.v1i1.385>
- Khairul, KZ, Rianti, E., Yenila, F., & Pradana, T. (2023). Quality Analysis of Employee Attendance Information Systems using the McCall Method. *KomtekInfo Journal*, 10, 93–100. <https://doi.org/10.35134/komtekinf.v10i3.417>
- Kurnialensya, T., & Saputra, PC (2023). STUDENT ATTENDANCE MONITORING SYSTEM USING WEB-BASED MICROCONTROLLER. *Rabit: Univrab Journal of Technology and Information Systems*, 8(1), 92–99. <https://doi.org/10.36341/rabit.v8i1.3039>
- Murni, S., & Sabaruddin, R. (2018). Utilization of Qr Codes in Developing a Web-Based Student Attendance Information System. *Journal of Information Technology and Management*, 4(2). <https://doi.org/10.26905/jtmi.v4i2.2144>
- Normah, Rifai, B., Vambudi, S., & Maulana, R. (2022). Sentiment Analysis of Vtuber Development Using the SMOTE-Based Support Vector Machine Method. *AMIK BSI Computer Engineering Journal*, 8(2), 174–180. <https://doi.org/10.31294/jtk.v4i2>
- Okpatrioka. (2023). Research and Development (R & D) Innovative Research in Education. *Journal of Education, Language and Culture*, 1(1), 86–100.
- Oktaviani, I., Sri Sumarlinda, & Widyaningsih, P. (2022). Application of the PIECES Method in Pharmacy Management Information System Analysis. *הָרָאָה*, 11(8.5.2017), 2003–2005.
- Santoso, H., Akbar, Z., & Helmina, H. (2022). Information System Analysis of the Success of the Online Ppdb Ready Website for the Jambi Provincial Education Service Using the Delone and McLean Method. *Journal of Informatics, Information Systems and Forestry (FORSINTA)*, 1(2), 1–11. <https://doi.org/10.53978/jfsa.v1i2.244>
- Septiani, D., Ruhama, S., & Astuti, I. (2023). Implementation of the Pieces Method to Analyze the Level of User Satisfaction of the Peduli Protect Application. *JIKI (Journal of Computer Science and Informatics)*, 4(1), 53–64.
- Wulandari, N., Supriatna, Engkos Qrcode, I., Information, S., Personnel, A., Office, P., Education, D., & Bekasi, K. (2021). Implementation of QRcode for the Personnel Attendance Information System at the Bekasi Regency Education Office. *JIMIKA (MI KA Informatics Journal)*, 5(2), 53–62. <https://journal.almuslim.ac.id/index.php/jki/article/view/3>