

Design and Development of A Web-Based Information System for Zakat Management And Monitoring At Lazisnu Pati

Windy Alayda¹, Endang Supriyati², Tri Listyorini³

Department of Informatics, Faculty of Engineering, Universitas Muria Kudus, Kudus, Indonesia

Author Email: 202251174@std.umk.ac.id¹, endangsupriyati@umk.ac.id², trilistyorini@umk.ac.id³

Orcid: <https://orcid.org/0009-0005-7364-9526>¹, <https://orcid.org/0000-0003-0386-582X>², <https://orcid.org/0000-0002-1334-7519>³

Abstract. This research presents the design and development of a web-based Zakat Information System at LAZISNU Pati aimed at improving transparency, efficiency, and accountability in zakat management. Zakat, a core Islamic obligation, requires institutions to uphold Sharia principles including amanah (trust), adl (justice), and hisbah (accountability). Existing digital platforms mainly address administrative processes, offering limited donor access and real-time monitoring. Using a Research and Development (R&D) approach combined with the Waterfall model, the system was implemented with Python Flask, MySQL, HTML/CSS/JavaScript, Midtrans, and WhatsApp API integration. Data were collected through observation, interviews, and documentation. System evaluation employed Black Box Testing and User Acceptance Testing (UAT) with muzakki and admin participants. Findings indicate that the system effectively supports registration, payment, unique code generation, distribution management, and reporting, while users reported high satisfaction with usability and clarity. By incorporating traceable transactions, nisab-based validation, automated notifications, and dashboards, the platform operationalizes Sharia values and fosters ethical zakat governance. This scalable, web-based system provides a practical model for enhancing digital governance and public trust in Islamic social finance institutions in Indonesia.

Keywords: Web-based Zakat System, Digital Transformation, Sharia Governance, Transparency, Accountability, Efficiency.

1 Introduction

Zakat is one of the pillars of Islam that plays a strategic role in improving community welfare [1]. Indonesia is a country with a predominantly Muslim population [2]. The development of digital technology has brought significant changes to various aspects of life, including zakat management [3]. In line with the digital era, zakat management particularly in the collection of zakat funds is conducted using the internet through digital zakat platforms [4]. The use of digital systems is no longer limited to the business and education sectors but is increasingly adopted.

Religious social institutions, such as zakat management organizations. The integration of information technology in zakat management is expected to enhance transparency, efficiency, and accountability, which are crucial for strengthening public trust in zakat institutions. Zakat is a religious obligation governed by Sharia principles such as amanah (trust), adl (justice), and hisbah (accountability). These principles require zakat institutions to ensure transparent financial records, equitable distribution, and systematic oversight of funds. In modern practice, zakat institutions need technological support to manage administration more efficiently. Digital transformation, the integration of digital technologies into organizational governance, serves as a crucial means to operationalize these Sharia principles. Therefore, implementing a web based information system for zakat management is not merely a technical improvement but a strategic approach to align religious foundations with efficiency, transparency, and stakeholder engagement in the digital era.

Zakat plays an important role in improving social welfare and economic justice among Muslims. Zakat is one of the pillars of Islam that must be fulfilled by every Muslim who meets the requirements to be a muzaki [5]. It is the third pillar of Islam and is obligatory (fardhu) [6]. Effective zakat management enables the proper distribution of funds to eligible recipients and supports poverty alleviation efforts. Zakat given to mustahik can contribute to their economic improvement if used for productive activities [7].

This issue is not limited to a single institution. A review of previous studies shows a recurring pattern in zakat management systems across different regions. Several web-based zakat systems primarily focus on administrative efficiency and data recording improvement [1], [8], while features related to public transparency, real-time monitoring, donor self-access, and integrated digital payments remain limited [9]. These recurring findings across multiple empirical studies and institutional contexts indicate that transparency limitations, workflow inefficiencies, and restricted donor access reflect broader structural challenges within zakat governance practices rather than isolated operational problems. Therefore, addressing these issues requires not only digitization, but comprehensive system integration that strengthens institutional accountability and stakeholder engagement.

In response to these structural issues, this study explores the potential of an integrated web-based zakat information system to promote greater transparency, enhance operational efficiency, and broaden donor access within zakat management institutions. The research focuses on designing and developing a system that extends beyond conventional administrative data handling by incorporating real-time transaction tracking, donor self-service access, and integrated digital payment facilities. In contrast to earlier systems that largely concentrate on internal administrative tasks, the proposed platform combines institutional management functions with mechanisms that support public transparency. The contribution of this study lies in reinforcing institutional accountability, fostering stakeholder confidence, and offering a practical digital governance framework that may guide other zakat institutions in their digital transformation efforts.

A web-based system was selected due to its wide accessibility, ease of maintenance, and cost efficiency for local zakat institutions. Unlike mobile applications that require installation and platform-specific development, and fully integrated fintech platforms that demand more complex technical and financial infrastructure, a web platform provides a more feasible and scalable solution. It can be accessed across multiple devices through standard web browsers, aligning with the operational capacity of LAZISNU Pati.

In this study, transparency refers to the availability and accessibility of accurate zakat transaction and distribution information to stakeholders, including real-time payment status and distribution records. Administrative efficiency is defined as the system's ability to streamline data processing, reduce manual workload, and accelerate reporting and monitoring processes. Accountability is operationalized as the integration of traceable transaction records, automated notifications, and structured reporting mechanisms that allow institutional activities to be monitored and verified. These constructs are embedded into the system through specific features such as payment history access, distribution tracking, dashboard summaries, automated WhatsApp confirmations, and downloadable financial reports.

2 Methods

2.1 Research Design

This study uses the *Research and Development (R&D)* method to design and develop a web-based Zakat Information System at LAZISNU Pati. The R&D method is a research approach used to produce a specific product and test its effectiveness [10]. R&D was chosen because this research does not only analyze problems but also develops a functional system tailored to real organizational needs, allowing iterative identification of user requirements and testing of solutions in a controlled manner.

Through an R&D approach, this research identified real-world problems and developed solutions that met the organization's needs. The focus was not on replacing the existing system at LAZISNU Pati, but rather on providing a more efficient, transparent, and integrated alternative. The result of this research is the design and development of a web-based zakat information system that addresses workflow inefficiencies, improves data accuracy, and facilitates better reporting and monitoring.

2.2 System Development Model

The system development follows the *Waterfall* model, which provides a structured and sequential approach. The Waterfall model was selected because it allows a linear, stage-by-stage development process, which is suitable for a system with clearly defined requirements and allows formal evaluation at each stage. The Waterfall model is a classical method in software development that operates in a linear and orderly manner, where each phase must be completed before proceeding to the next [8]. This method is known as the sequential linear development method or the classic life cycle [11]. Using Waterfall ensures that the system design is systematically implemented, tested, and validated before deployment, providing a clear trace from requirement analysis to maintenance, which strengthens methodological rigor. The Waterfall stages applied in this study can be seen in Figure 1 as an illustration:

a. Requirement Analysis

This stage involves identifying user needs through interviews and direct observation at LAZISNU Pati. The analysis focuses on zakat collection, distribution, reporting, and monitoring processes to

ensure the system meets user requirements. This ensures that the system development aligns with actual user needs and research objectives.

b. Design

At this stage, the system structure, database, and user interface (UI/UX) are planned. The main features include the admin dashboard, donor (muzakki) management, transaction reports, and the distribution feature which comprises a form for entering distribution data and a distribution history for monitoring. Integration with a payment gateway and an automatic notification system is also planned.

c. Implementation

In this stage, the system design is transformed into a working program using *Python Flask* for the backend, *MySQL* as the database, and *HTML, CSS, and JavaScript* for the frontend interface. The system is also integrated with Midtrans for digital payment processing and WhatsApp API for automatic notifications.

d. Testing

System testing is conducted using Black Box Testing. This type of testing is performed from the perspective of the end user [12]. In addition, User Acceptance Testing (UAT) is carried out with actual users (Muzakki and Admin) to assess user satisfaction, ease of use, and system performance. Effectiveness is measured using multiple indicators, including task completion rate, time required for zakat processing, accuracy of transaction records, response time of automated notifications, and overall user satisfaction scores. The combination of Black Box Testing and UAT ensures that the system is validated against functional requirements and user expectations, reinforcing the methodological rigor of the development process.

e. Maintenance

This stage includes fixing bugs that appear after system deployment and updating the system to accommodate future user requirements.

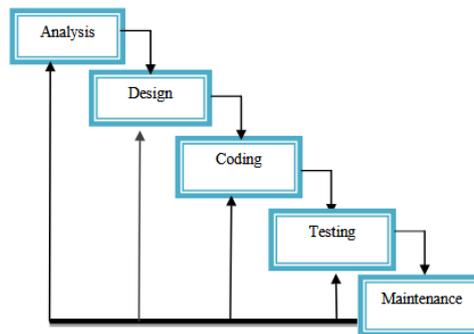


Figure 1. Stages of the Waterfall Model

2.3 Data Collection Methods

Data were collected using qualitative methods with a descriptive approach to support system requirement analysis. The data collection techniques include:

a. Observation

Direct observations at LAZISNU Pati were conducted to understand the zakat management workflow. Observations identified challenges such as manual recording, inconsistent reporting, and a lack of transparency.

b. Interviews

Interviews were conducted with the head and administrative staff to identify system requirements and determine key features, including zakat payment history and distribution features along with their forms and history.

c. Documentation

Reviewing secondary sources, such as zakat reports, donor records, and distribution data, to inform the database and system design

2.4 System Architecture and Technical Details

The web-based zakat information system uses a client-server architecture, with the backend developed in Python Flask, the frontend using HTML, CSS, and JavaScript, and a centralized MySQL database for data storage. The system is integrated with the Midtrans payment gateway for digital transactions and the WhatsApp API for automatic notifications. This architecture enables real-time data access, promotes transparency, and minimizes the risk of input errors.

Muzakki can register, obtain a unique code, make digital zakat payments, and monitor their payment history. Admins manage muzakki data, set gold prices as the basis for zakat calculation, process transactions, manage zakat distribution, and generate reports. The public dashboard displays the number of muzakki, total zakat, remaining zakat, and monthly zakat collection charts, while the admin dashboard facilitates comprehensive data and report management. The system implements admin authentication via username/password, unique codes as muzakki identities, protection of sensitive data, secure transactions through Midtrans, and WhatsApp notifications as transaction confirmations.

3 Results and Discussion

3.1 System Design

3.1.1 Flowchart

A *Flow Chart* is a diagram that describes the workflow of an application, from the beginning before the application is run to the end of the application [13]. The Muzakki *flowchart* illustrates the zakat payment process, from registration and unique code validation to payment via *Midtrans*, with transaction data saved and *WhatsApp* notification sent after completion, as shown in Figure 2.

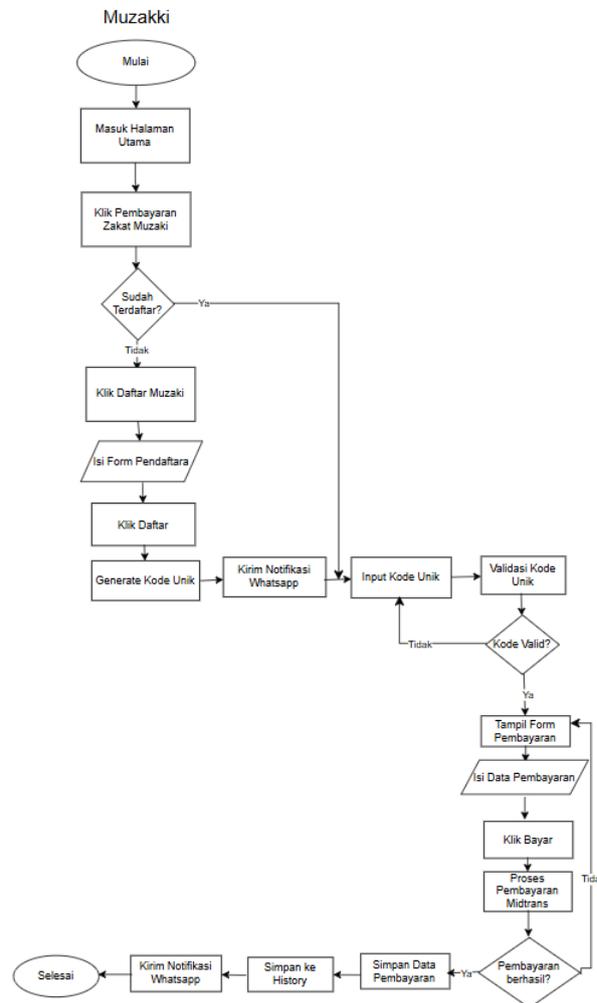


Figure 2. Muzakki Flowchart

The Admin *flowchart* illustrates the zakat management process, beginning with login and dashboard access. The Admin manages zakat data and performs zakat distribution by filling in the distribution form. Valid data are stored, displayed in the distribution history, and can be downloaded, as shown in Figure 3.

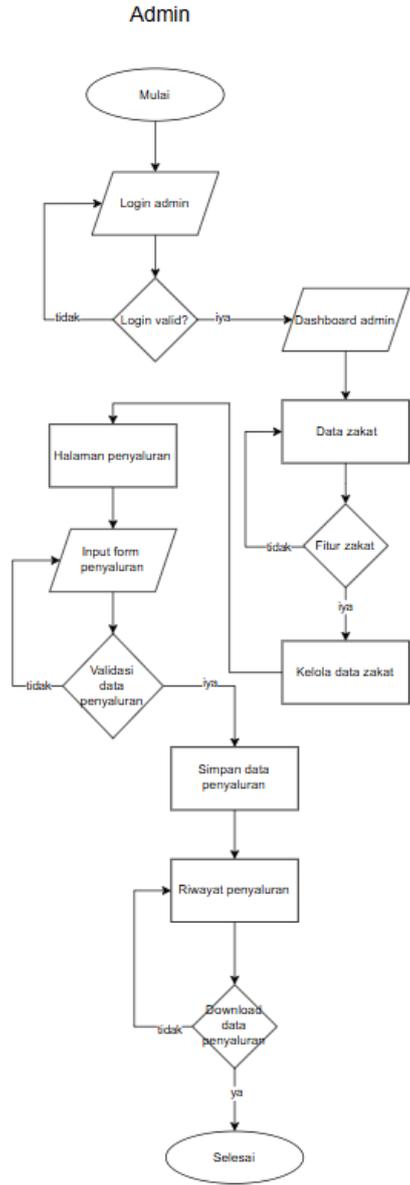


Figure 3. Admin Flowchart

3.1.2 **Sequence Diagram**

A *Sequence Diagram* is a diagram that illustrates interactions between objects [14]. The admin sequence diagram shows the login process, dashboard access, zakat data management, gold price updates, and zakat distribution. All distribution data are stored in the database and can be downloaded as reports, as shown in Figure 4.

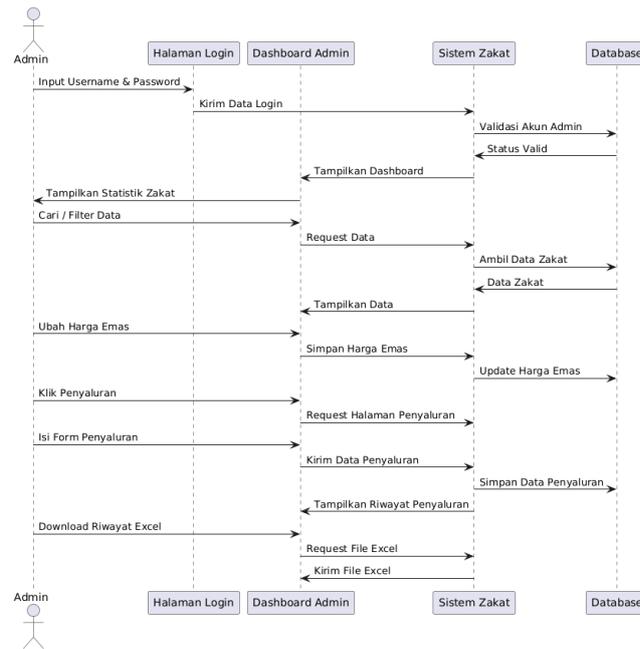


Figure 4. Admin Sequence Diagram

The muzakki *sequence diagram* illustrates user registration to obtain a unique code, code verification, zakat payment via *Midtrans*, data storage, *WhatsApp* notification, and access to payment history, as shown in Figure 5.

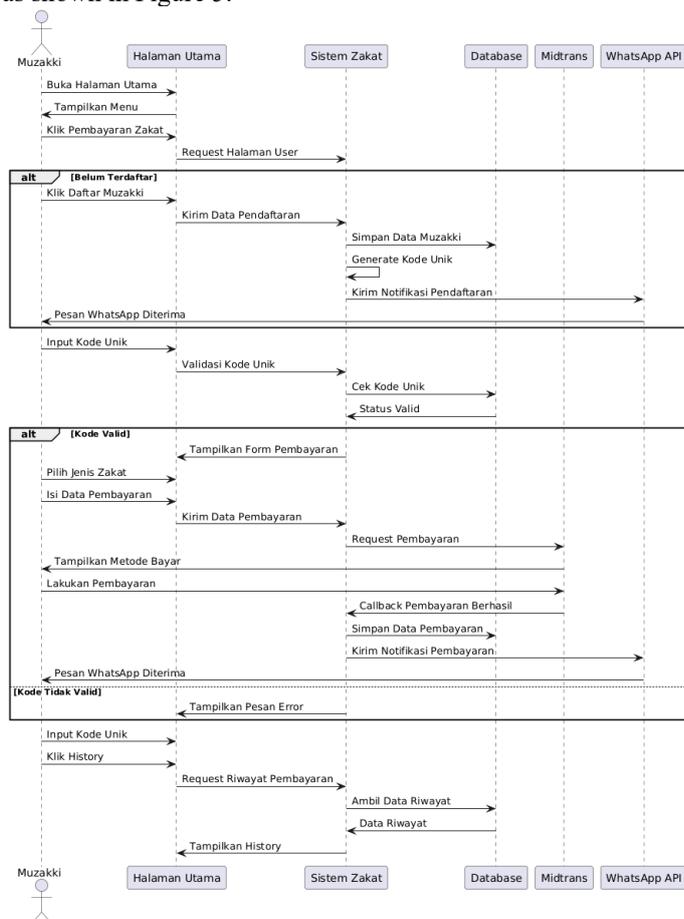


Figure 5. Muzakki Sequence Diagram

3.1.3 Data Flow Diagram (DFD)

DFD can create a visual representation of the system, making it easier to understand [15]. The diagram shows the interaction between the zakat system, the admin, and the muzakki. Muzakki performs registration and zakat payments and receives a unique code, payment status, and notifications. The admin manages system data, gold prices, zakat distribution, and reports, as shown in Figure 6.



Figure 6. Context Diagram

This diagram illustrates the main workflow of the zakat information system involving muzakki and admin, including registration, payment, zakat distribution management, and report generation processed centrally by the system, as shown in Figure 7.

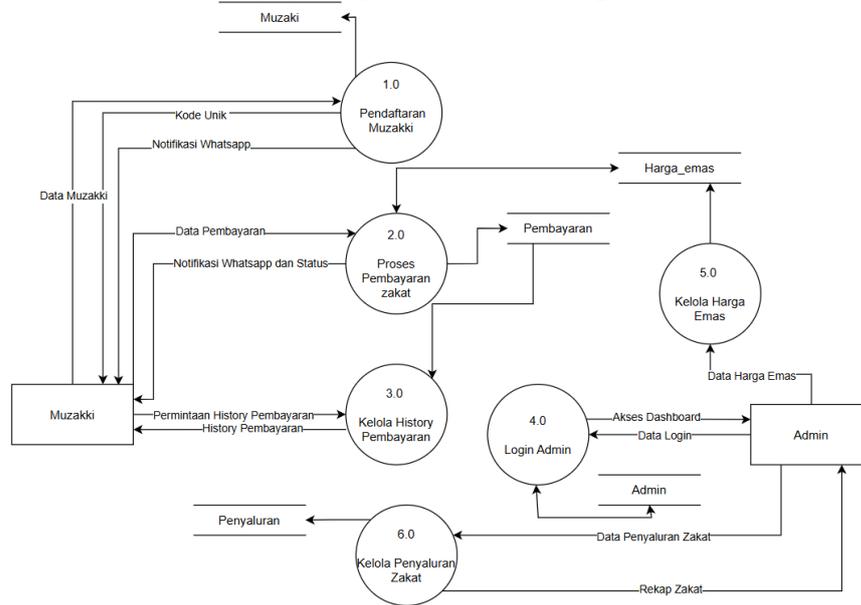


Figure 7. Data Flow Diagram

3.1.4 Use Case Diagram

The use case illustrates how actors and the system interact [16]. This zakat information system involves Admin and Muzakki. Admin manages zakat data, reports, gold prices, and distribution, while Muzakki register to obtain a unique code for zakat payment and payment history access. Transactions are integrated with *Midtrans* and supported by *WhatsApp* notifications, as shown in Figure 8.

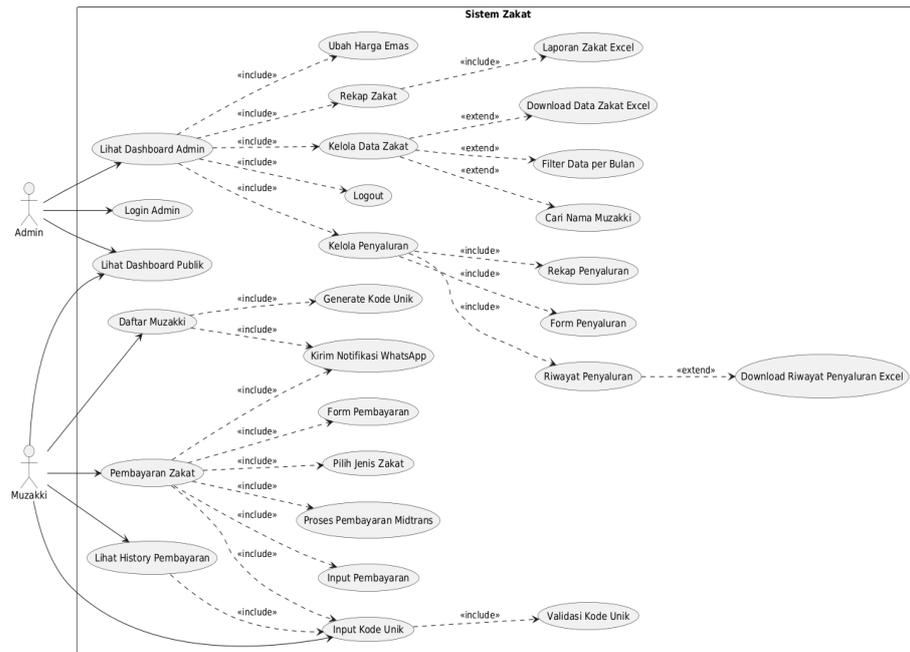


Figure 8. Use Case Diagram

3.2 Interface Design

3.2.1. Application for Muzzaki

A. Main Page

The main page displays general information about the NU CARE-LAZISNU Pati zakat information system, the institution’s identity, and the main menu to access zakat payment services and other features, as shown in Figure 9.

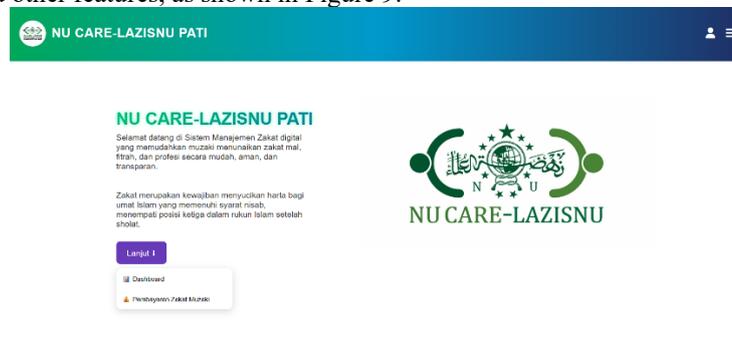


Figure 9. Main Page

B. User Page

The user page allows muzakki to enter a unique code, register as a new muzakki, view payment history, and navigate to other pages, as shown in Figure 10.

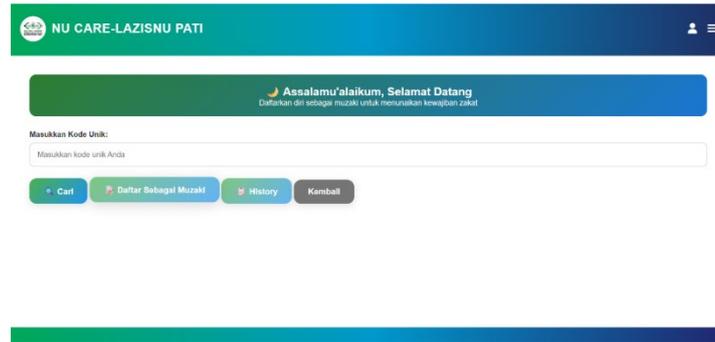


Figure 10. User Page

C. Muzakki Registration Page

This page is used for muzakki registration by filling in personal data. After successful registration, the system generates a unique code as the user's identity, as shown in Figure 11.

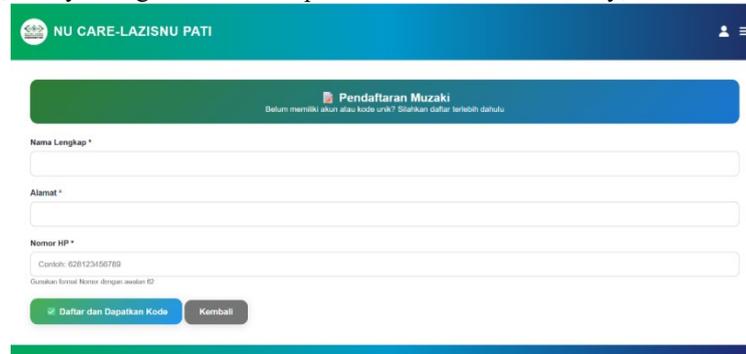


Figure 11. Muzakki Registration Page

D. Unique Code and WhatsApp Notification

After registration, the system displays the unique code and sends a WhatsApp notification as confirmation of muzakki registration, which can be seen in Figures 12 and 13.



Figure 12. Unique Code

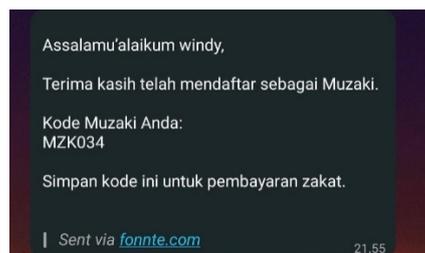


Figure 13. WhatsApp Notification

G. Payment Notification

After a successful transaction, the WhatsApp notification confirming the zakat payment can be seen in Figure 18.



Figure 18. WhatsApp notification

H. Payment History Page

The history page displays records of zakat payments made by muzakki. The data is updated automatically after each successful transaction, as shown in Figure 19.

Nama	Tanggal	Jumlah Zakat	Jenis Zakat	Status
windy	Sun, 28 Dec 2025 21:57:31 GMT	Rp 150.000	profesi	lunas
-	Sun, 28 Dec 2025 13:41:46 GMT	Rp 1.375.000	mal	lunas
-	Sun, 28 Dec 2025 13:24:57 GMT	Rp 25.000	fitriah	lunas
-	Tue, 23 Dec 2025 08:37:52 GMT	Rp 1.500.000	profesi	pending

Kembali ke Halaman Utama

Figure 19. Payment History

3.2.2. Application for admin

A. Admin Login Page

The admin login page allows administrators to access the system by entering a valid username and password, as shown in Figure 20.

Login Admin

Username

Password

Login Kembali

Figure 20. Admin Login

B. Admin Dashboard

The dashboard displays a summary of zakat data, including total registered muzakki, total zakat received, pending approvals, types of zakat, and a table of completed payments, as shown in Figure 21.

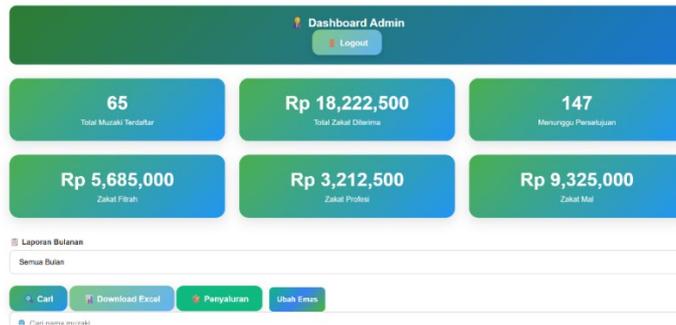


Figure 21. Admin Dashboard

C. Data Search and Export Feature

This feature allows admins to search muzakki data and download zakat records in Excel format for reporting and archiving purposes, as shown in Figure 22.

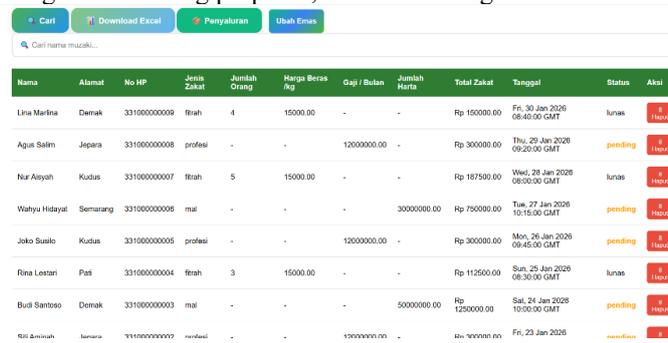


Figure 22. Data Search and Export Feature

D. Gold Price Management

This feature enables admins to update the gold price used as a reference for zakat calculation, as shown in Figure 23.

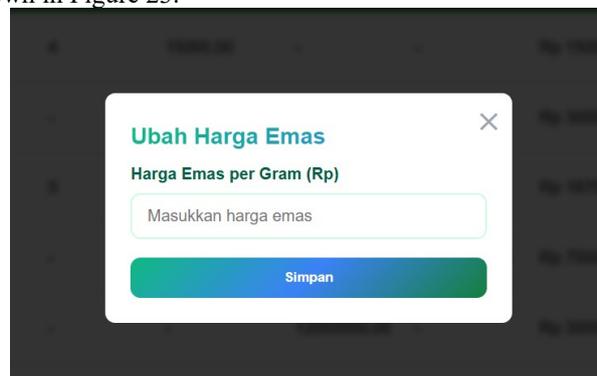


Figure 23. Gold Price Management

E. Zakat Distribution Page

The zakat distribution page allows admins to manage zakat distribution through the dashboard menu, as shown in Figure 24.



Figure 24. Zakat Distribution

F. Distribution Form

Admins can input zakat distribution data using the distribution form provided by the system, as shown in Figure 25.

The form includes the following fields:

- Jenis Penyaluran: Dropdown menu
- Lokasi Penyaluran (Kecamatan): Dropdown menu
- Tanggal Penyaluran: Date input (dd/mm/yyyy)
- Catatan (Optional): Text area
- Upload Bukti Penyaluran: File upload button
- Konfirmasi Penyaluran: Submit button

Figure 25. Distribution Form

G. Distribution History Management

This page displays zakat distribution history and provides features to search, edit, delete, and export data in Excel format, as shown in Figure 26.

NO	JENIS	JUMLAH HEWAN	LOKASI	TOTAL PENYALURAN (Rp)	TANGGAL	CATATAN	BUKTI	AKSI
1	uang	-	Mergoyoso	Rp 1.100.000	2025-01-11	sembako		
2	uang	-	Mergoyoso	Rp 400.000	2025-01-09	membantu kebutuhan sehari-hari		
3	kambing	1	Tayu	Rp 1.500.000	2025-01-07	ternak		
4	uang	-	Tayu	Rp 500.000	2025-01-06	dibagikan ke Ibu Sumini Desa Keboromo		
5	uang	-	Tayu	Rp 100.000	2025-12-29	dibagikan kepada bapak joko		
6	uang	-	Batangan	Rp 200.000	2025-12-29	Dibagikan ke Ibu Sumarti desa Batunari		
7	uang	-	Tayu	Rp 122.500	2025-12-17	ya		

Figure 26. Distribution History Management

3.3 System Testing Results

A. Black Box Testing Results

Black Box Testing using the Midtrans sandbox confirmed that all muzakki-side system functions, including registration, zakat payment, unique code generation, payment history display, and WhatsApp notification, operated as expected as shown in Table 1.

Table 1. Black Box Testing Results for Muzakki

No	Function	Test Scenario	Expected Result	Test Result	Status
1	Muzakki Registration	Muzakki fills out the registration form	Data is saved and a unique code is generated	As expected	Successful
2	Generate Unique Code	System generates a code after registration	Unique code appears automatically	As expected	Successful
3	Validate Unique Code	Muzakki enters the unique code	System verifies the code	As expected	Successful
4	Select Zakat Type	Muzakki selects a type of zakat	Zakat type is recorded	As expected	Successful
5	Enter Payment Data	Muzakki fills out the payment form	Payment data is saved	As expected	Successful
6	Payment Process	Muzakki makes a payment via Midtrans	Payment status is recorded	As expected	Successful
7	Payment History	Muzakki opens the history menu	History data is displayed	As expected	Successful
8	WhatsApp Notification (Payment)	After successful payment, a WhatsApp notification appears	Muzakki receives payment notification via WhatsApp	As expected	Successful
9	WhatsApp Notification (Registration)	After successful registration	Muzakki receives registration notification via WhatsApp	As expected	Successful

All admin features functioned properly based on the test results in Table 2. Login, dashboard display, data search/filter, report download, gold price management, and zakat distribution ran as expected as shown in Table 2.

Table 2. Black Box Testing Results for Admin

No	Function	Test Scenario	Expected Result	Test Result	Status
1	Admin Login	Admin enters username and password	Admin accesses the dashboard	As expected	Successful
2	Admin Dashboard	Admin accesses the dashboard	Summary data is displayed	As expected	Successful
3	Manage Zakat Data	Admin views zakat data	Zakat data is displayed	As expected	Successful
4	Search Muzakki Data	Admin searches by name	Data matches the search keyword	As expected	Successful
5	Monthly Data Filter	Admin filters data by month	Data is filtered accordingly	As expected	Successful
6	Download Zakat Report	Admin downloads zakat data	Report file is downloaded	As expected	Successful
7	Update Gold Price	Admin updates the gold price	Price data is saved	As expected	Successful
8	Zakat Distribution Form	Admin fills out the distribution form	Distribution data is saved	As expected	Successful
9	Distribution History	Admin views distribution history	History data is displayed	As expected	Successful
10	Download History	Admin downloads distribution data	File is successfully downloaded	As expected	Successful

B. User Acceptance Testing (UAT) Results

The UAT results show that most muzakki were satisfied or very satisfied with the web-based Zakat Information System, with some neutral responses and no dissatisfied or very dissatisfied feedback. as shown in Table 3.

Table 3. UAT Results for Muzakki

No	Question	VS	S	N	D	VD
1.	How satisfied are you with the ease of the registration process as a Muzakki?	13	10	0	0	0
2.	How satisfied are you with the clarity of zakat information displayed on the system's home page?	17	5	1	0	0
3.	How satisfied are you with the ease of entering zakat data in the system?	16	7	0	0	0
4.	How satisfied are you with the clarity of the zakat payment status information?	15	8	0	0	0
5.	How satisfied are you with the ease of accessing zakat payment history?	17	5	1	0	0
6.	How satisfied are you with the Zakat Information System overall?	13	9	1	0	0
7.	How satisfied are you with the interface (appearance) of the Zakat Information System?	12	10	1	0	0
8.	How satisfied are you with the notifications or confirmations received after making zakat payments?	12	10	1	0	0
9.	How satisfied are you with the ease of using the system's features?	13	10	0	0	0
10.	How satisfied are you with the ease of navigating the system menus?	14	9	0	0	0

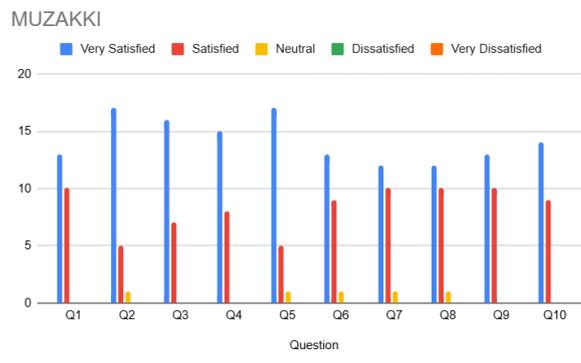


Figure 27. UAT Results Chart for Muzakki

Most of the admin respondents felt satisfied or very satisfied, with two neutral responses on the download feature and the history feature, and no dissatisfied ratings, as shown in Table 4.

Table 4. UAT Results for Admin

No	Question	VS	S	N	D	VD
1	How satisfied are you with the ease of logging in as an admin?	13	10	0	0	0
2	How satisfied are you with the appearance of the admin dashboard?	15	8	0	0	0
3	How satisfied are you with the ease of viewing Muzakki and zakat data summaries on the dashboard?	16	7	0	0	0
4	How satisfied are you with the ease of searching for Muzakki data using the search feature?	15	8	0	0	0

5	How satisfied are you with the Excel report download feature?	17	5	1	0	0
6	How satisfied are you with the ease of viewing zakat types (Fitrah, Mal, Profession)?	13	10	0	0	0
7	How satisfied are you with the ease of viewing total collected zakat and remaining zakat on the dashboard?	18	5	0	0	0
8	How satisfied are you with the ease of filling out forms in the zakat distribution system?	14	9	0	0	0
9	How satisfied are you with the zakat distribution history feature and its ease of management?	18	4	1	0	0
10	How satisfied are you with the Zakat Information System overall from the admin's perspective?	11	12	0	0	0

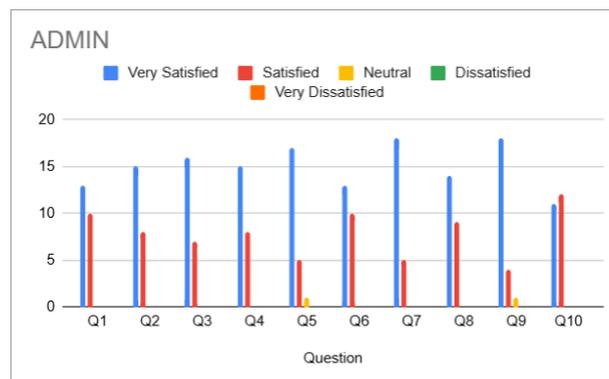


Figure 28. UAT Results Chart for Admin

The effectiveness of the developed web-based Zakat Information System was evaluated using Black Box Testing and User Acceptance Testing (UAT). Black Box Testing confirmed that all system functionalities including registration, unique code generation, zakat payment processing, payment history, and WhatsApp notifications operated correctly according to expected results. UAT was conducted with 23 Muzakki users and 23 Admin users who assessed usability, clarity of information, ease of navigation, and overall satisfaction. The majority of Muzakki respondents reported being satisfied or very satisfied with only a few neutral responses, while all Admin respondents were largely satisfied or very satisfied except for minor neutral feedback on report downloads and distribution history features. Performance metrics such as task completion rate, accuracy of transaction records, response time for notifications, and report generation were also analyzed. These evaluation and validation results indicate that the system meets technical requirements, is user-friendly, and effectively enhances transparency, efficiency, and accountability in zakat management.

Beyond confirming technical performance and positive user acceptance, the proposed system also demonstrates alignment with fundamental Islamic governance values. The incorporation of traceable transaction records and unique code authentication mechanisms embodies the principle of *amanah* (trust), ensuring that zakat funds are securely managed and properly documented. The structured recording of zakat distribution, supported by nisab-based validation, reinforces *adl* (fairness) by promoting equitable allocation to eligible beneficiaries. Moreover, the availability of real-time dashboards, automated WhatsApp confirmations, and downloadable financial reports reflects the operationalization of *hisbah* (accountability), as institutional activities can be systematically monitored and verified. Accordingly, the system contributes not only to administrative efficiency but also to strengthening ethical governance within zakat management practices.

This study contributes to the literature on digital zakat platforms by presenting an integrated web based system that enhances transparency, efficiency, and accountability in zakat management. Unlike previous systems that mainly focus on administrative tasks, this platform includes real time transaction tracking, donor self service, digital payment integration, automated notifications, and structured reporting. By embedding Sharia principles *amanah*, *adl*, and *hisbah*, the system ensures secure, fair, and accountable zakat management while providing practical guidance for institutions seeking to strengthen digital governance.

3.4 Practical and Policy Implications

The web-based Zakat Information System developed for LAZISNU Pati offers clear practical benefits for zakat management organizations. It streamlines administrative tasks, improves data accuracy, enables real-time monitoring of zakat collection and distribution, and enhances donor engagement through automated WhatsApp notifications and accessible dashboards. Zakat institutions and policymakers can adopt this integrated platform to strengthen digital governance, ensure fair and Sharia-compliant distribution, and increase public trust in zakat management. Furthermore, this system provides a scalable model that can support broader Islamic social finance governance in Indonesia by promoting transparency, accountability, and operational efficiency across multiple institutions.

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Conflict of Interest.

The author declares no conflict of interest regarding this research. The study was conducted independently, and the results were not influenced by any organization, financial support, or personal interest.

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