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THE ROLE OF ACCOUNTING INFORMATION SYSTEMS IN ENHANCING FINANCIAL ACCOUNTABILITY IN ISLAMIC BOARDING SCHOOLS (PESANTREN)

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ABSTRACT

This study examines the transformation of manual financial recording practices in Islamic boarding schools (pesantren) into a digital financial database prototype to enhance accountability and compliance with accounting standards. Using a qualitative descriptive approach, data were collected through interviews with financial staff, direct observations, and analysis of manual financial documents. The study aims to identify the structure and flow of existing manual records and translate them into a structured digital data model capable of producing standardized financial reports. The findings show that manual financial records are generally fragmented, inconsistent, and lack systematic classification, resulting in limited traceability and delays in report preparation. Based on data classification and mapping, this study develops a digital database prototype that integrates key financial activities, including cash receipts, disbursements, budgeting, and fund allocation. The prototype is designed to generate financial statements in accordance with nonprofit accounting standards, such as the statement of financial position, statement of activities, cash flow statement, and notes to financial statements. The study also identifies challenges related to data migration, staff digital literacy, and the need for clear standard operating procedures. Nevertheless, the results indicate that digitalization significantly improves the accuracy, accessibility, and reliability of financial information. This study concludes that the development of a digital financial database prototype is a strategic step for pesantren to strengthen transparency, internal control, and standardized financial reporting.

Keywords: Accounting information system; data prototype; internal control.

1. INTRODUCTION

Islamic educational institutions, particularly Islamic boarding schools (pesantren), play a vital role in strengthening Islamic values, promoting religious understanding, and shaping morally grounded communities. Beyond their educational function, pesantren also operate as social institutions responsible for community empowerment, character development, and the preservation of Islamic values. These roles are carried out through various educational and operational activities that require careful management of financial resources entrusted by students, parents, donors, and the wider Muslim community.

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To support these activities, pesantren rely on an internal management structure in which administrators manage functional areas, including finance. In this arrangement, administrators act as institutional agents, while the community serves as the principal that entrusts resources to the pesantren. Because almost all pesantren activities involve financial transactions, accountability becomes a central requirement. Financial accountability therefore reflects not only managerial responsibility but also moral and spiritual obligations.

In Islamic teachings, accountability (muhasabah) is closely linked to ethical conduct and integrity. Responsibility extends beyond accountability to other people and includes accountability before Allah SWT. Accountability is defined as Allah-oriented responsibility aimed at creating and distributing welfare and added value for stakeholders, including investors, employees, managers, communities, and the environment (Triana dkk.:2544–2563, 2023). This theological foundation emphasizes honesty, justice, and transparency in managing entrusted resources. Consequently, financial accountability in pesantren is not merely procedural but represents a moral and spiritual duty.

In the contemporary context, financial accountability in religious educational institutions requires systems that ensure transparency, accuracy, and traceability, as digital technologies increasingly function as instruments of public accountability and trust-building (Elbanna et al., 2021). However, many pesantren still rely on manual bookkeeping, which often leads to inconsistent records, limited information access, and difficulties in producing financial reports aligned with nonprofit accounting standards. As organizational activities become more complex, the need for a reliable financial information framework becomes increasingly urgent. This condition highlights the importance of transforming manual financial records into a digital financial database supported by an Accounting Information System (AIS). The application of internal control systems and AIS is essential to ensure that financial statements are relevant, reliable, comparable, and understandable (Majid, Suwandi, Bulutoding, Sumarlin & Wawo:1–19, 2020).

The transition from manual to digital data processing offers significant potential to strengthen accountability by standardizing data recording, reducing human error, and enabling faster and more accurate reporting. Through digital transformation, pesantren can generate financial statements that comply with accounting standards, including statements of financial position, activities, cash flows, and related disclosures. Digital systems also enhance internal control mechanisms and help build trust among stakeholders.

Given the growing importance of accountability and ethical financial management, this study examines how digital record-keeping can support good governance in pesantren. The research aims to identify the structure and weaknesses of existing manual financial records and to develop a prototype digital database capable of producing standardized financial reports. Accordingly, this study addresses the following research questions: (1) How are financial activities recorded manually in pesantren? (2) What processes are required to transform manual records into a digital financial database prototype? (3) How can digital data models support compliance with nonprofit accounting standards? (4) What are the implications of digital transformation for improving financial accountability in pesantren? and (5) What recommendations can be proposed to strengthen financial reporting practices in pesantren?

2. METHODS

The research method used in this study is qualitative descriptive. It aims to explore the process of transforming manual financial recording systems in pesantren into a structured digital financial database prototype. This approach was implemented through interviews, observations of financial activities, and examinations of existing financial documents. The qualitative descriptive method allows the researcher to understand financial operations in pesantren, interpret managerial practices in their natural setting, and develop a digital recording model aligned with accounting standards. In addition, this study incorporates Islamic principles—amanah (trust), itqan (professionalism), and muhasabah (accountability)—as an ethical framework to describe financial management practices and to address accountability challenges in pesantren.

This research was conducted at Pesantren Darul Arqam Gombara, Makassar, South Sulawesi, which still applies a manual bookkeeping system. The research process combined an information technology review with direct field visits. The study was carried out over a six-month period, from April 2025 to October 2025. The data collected consisted of both primary and secondary data. Primary data were obtained from individuals directly involved in financial activities, including treasurers, administrative staff, and management personnel responsible for financial transactions. Secondary data were sourced from financial guidelines, accounting literature, nonprofit accounting standards, as well as the Qur'an, Hadith, and institutional financial documents.

The sampling technique used in this study was purposive sampling. Informants were deliberately selected based on criteria relevant to the research objectives. These criteria included: (1) involvement in daily financial recording and reporting activities, (2) authority or responsibility in financial decision-making, and (3) experience with the existing manual bookkeeping system. The selected informants consisted of the pesantren treasurer, financial administration staff, and management representatives. A total of five informants participated in the study. This number was determined based on data saturation, where data collection continued until no new significant information emerged.

Data collection techniques included document studies, in-depth interviews, and observations. Document studies involved examining institutional records such as cash books, receipts, financial reports, digital files, correspondence, and financial policies. Contextual information from these documents was recorded to maintain authenticity and accuracy of interpretation (Patton, 2014). The documents were used to identify the data elements required for developing the digital database prototype.

In-depth interviews were conducted to obtain detailed information on informants' experiences and perceptions of financial recording practices. The interviews generated verbal data related to accountability issues, including inconsistencies in manual records, reporting difficulties, and expectations regarding digitalization. Interview results were documented and transcribed for analysis.

Observations were conducted to obtain direct descriptions of financial recording practices in their natural context. The researcher observed people, processes, and documentation flows without interfering with daily activities. This included observing receipt processing, expense recording, and manual report preparation. These observations provided insights into transaction patterns, staff competencies, and organizational workflows. Structured observations followed existing financial procedures and were complemented by remote observation when direct access was limited.

This study was designed to address the transformation of pesantren financial accountability from manual to digital systems through three stages: normative study, empirical study, and

confirmation and verification of results. The normative study examined Islamic ethical principles and nonprofit financial reporting standards. The empirical study involved collecting field data, analyzing interviews, and reviewing financial documents. The final stage confirmed normative principles using empirical findings to develop a digital database prototype grounded in Islamic ethics and accounting standards.

The data recording process followed systematic steps. Initial notes were taken during interviews and document reviews using keywords and key statements. These notes were then expanded into descriptive and reflective field notes. After refinement for clarity and coherence, the data were coded to support classification, analysis, and pattern identification for prototype development.

In addition to field data coding, laboratory-based experimental activities were conducted to simulate the digitalization process. These activities included testing database structures, experimenting with data input formats, and running trial entries to observe error detection mechanisms. Digital recording interfaces were also compared. The experiments allowed refinement of the prototype design, evaluation of automated classification efficiency, and selection of an appropriate data model for pesantren financial transactions. Various tools, including notebooks, mobile devices, and laptops, were used to support both fieldwork and laboratory simulations. All data were compiled into word-processing and spreadsheet files for organization, testing, and cross-checking. These laboratory activities followed an iterative testing and validation approach consistent with software engineering best practices (Pressman & Maxim, 2019).

To evaluate the effectiveness of the digital financial database prototype, this study applied quantitative evaluation indicators. These indicators assessed efficiency, accuracy, data consistency, system performance, and data completeness in comparison with manual recording practices. The indicators were not intended for statistical generalization but were used to provide objective measurements supporting the qualitative findings.

Data validity was ensured through triangulation. This process involved comparing information from different sources, informants, times, and documents. Interview results were cross-checked with financial records and confirmed with informants to ensure accuracy. Laboratory experiment results were also compared with field data to confirm that the prototype reflected actual financial practices. Through triangulation, the credibility of the findings was strengthened, ensuring that the results accurately represent financial recording conditions in pesantren.

3. RESULTS AND DISCUSSION

3.1 Overview of Manual Financial Record-Keeping Practices in Pesantren

The findings show that Baitul Arqam Islamic boarding schools still rely on manual financial recording systems using cash books, simple journals, and physical document archives. This practice has persisted due to entrenched administrative culture, limited human resources, and minimal use of information technology. These conditions are consistent with Rahmawati (2018:44), who notes that community-based educational institutions often retain traditional administrative systems because they are perceived as simple, despite their structural weaknesses.

Interviews and observations indicate that financial records are maintained through daily cash books, unit-level cash books, and folders containing physical transaction evidence. However,

these records do not use standardized charts of accounts. Most transactions are classified only as income or expenditure, without reference to nonprofit accounting standards. This finding aligns with Marzuki (2020:57), who states that manual record-keeping in religious institutions is often unsystematic due to the absence of standardized account classifications.

A major weakness of manual systems is the high risk of human error. Common problems include miscalculations, cash balance discrepancies, and missing transaction documents. Pradana (2019:102) reports that manual bookkeeping can increase recording errors by up to 30% because it depends entirely on individual operators. Field observations further show that treasurers often manage multiple administrative tasks simultaneously, leading to delayed and retrospective entries that increase the risk of inaccurate data.

Manual systems also result in weak internal control, particularly in document safeguarding. Physical records are vulnerable to loss, damage, and misplacement. Without backup mechanisms, the loss of a cash book or document file results in the permanent loss of financial data. This condition supports the findings of Lubis (2021:88), who emphasizes that manual systems lack redundancy and are highly vulnerable to physical damage and data loss.

In terms of transparency, financial reports are usually prepared only when requested by leaders or donors rather than on a regular basis. Report formats also vary and do not comply with PSAK 45 or other nonprofit reporting standards. This inconsistency limits accountability, especially for pesantren that manage public funds such as donations, waqf, and government assistance. Abdullah (2017:73) highlights that the absence of standardized reporting in religious institutions reduces comparability and restricts financial analysis.

Operationally, manual record-keeping complicates data compilation and report preparation, particularly for cash flow statements, activity reports, and statements of financial position. Data must be gathered from multiple books and physical documents, making the process time-consuming. Setiawan (2020:119) shows that digitalization can reduce reporting time by up to 60%, illustrating the inefficiency of manual practices.

Overall, the findings indicate that manual financial systems produce data that are less accurate and difficult to verify (Rahmawati, 2018:46), require slow and inefficient reporting processes (Setiawan, 2020:119), limit transparency and accountability—especially for public funds (Abdullah, 2017:75), and carry a high risk of data loss due to the absence of backup systems (Lubis, 2021:89).

These results underscore the urgency of implementing financial digitalization through a structured digital financial database. Such a system can improve accuracy, accessibility, data security, and overall accountability in pesantren financial management.

3.2 Analysis of Digitalization Needs and Identification of Financial Data Components

The transition from manual to digital financial systems in pesantren requires a clear understanding of information gaps, weak data structures, and reporting limitations in traditional bookkeeping. The findings of this study show that digital systems significantly outperform manual practices and that pesantren urgently need a structured digital financial database to improve accountability, transparency, and operational efficiency. Saputra (2020:63) notes that digital transformation in nonprofit institutions is mainly driven by the need for higher data accuracy, faster reporting, and greater reliability. These drivers are consistent with the conditions observed in the pesantren studied.

First, the study identifies significant information gaps in manual systems. Manual records do not provide real-time financial information, making it difficult for pesantren leaders to monitor

cash balances, program expenditures, or donor fund usage. Interviews with financial administrators revealed that reports are often delayed for weeks due to the need to compile data from multiple physical documents. This finding supports Hasan (2019:80), who argues that organizations relying on manual recording experience delayed decision-making because of slow data consolidation.

In addition, key financial information—such as donor histories, student payment patterns, and program-based expenditures—is not systematically recorded. Financial data are scattered across multiple books, weakening control over fund allocation and monitoring. Rahayu (2018:54) similarly emphasizes that fragmented records prevent nonprofit organizations from effectively evaluating program-based budgeting.

Second, the study highlights the need for a standardized financial data structure. The absence of a standardized chart of accounts results in inconsistent transaction classification. Digitalization therefore requires predefined account codes aligned with nonprofit accounting frameworks. This structure is essential for internal reporting and compliance with PSAK 45 and other nonprofit accounting standards. Susanto (2021:102) stresses that digital financial systems must be built on standardized data models to ensure report reliability and comparability.

To meet these requirements, the study identifies several essential components of a digital financial database. These include standardized account codes and categories, transaction metadata (such as dates, descriptions, amounts, responsible officers, and approval status), donor and funding source records, unit- and activity-based financial data, and digital storage of transaction evidence. Together, these components ensure structured, verifiable, and traceable financial information, as emphasized by Wibowo (2020:141).

Third, the findings indicate the importance of structuring financial data into a digital database model. A relational database is required to link accounts, transactions, donors, and activities. The system must support multi-level authorization, real-time updates, and automated audit logs. Nugroho (2021:93) explains that relational database models are well suited for nonprofit organizations because they maintain data integrity, reduce duplication, and improve reporting accuracy.

Based on the analysis, the most suitable structure for the pesantren consists of master tables (chart of accounts, user profiles, and funding sources), transaction tables (cash receipts, cash disbursements, and journal entries), and supporting tables (program activities, vendors, students, and donors). This structure reflects a comprehensive and integrated financial system for digital implementation.

Fourth, the digital database must support standardized financial reporting outputs. The analysis shows that the structured data can be directly mapped to core nonprofit financial statements, including the Statement of Financial Position, Statement of Activities, Statement of Cash Flows, and Notes to Financial Statements. Without a structured database, pesantren cannot produce these reports consistently or accurately. Paramita (2020:76) confirms that digital databases improve nonprofit financial reporting quality by providing structured and traceable input data.

Finally, digitalization has important implications for accountability and governance. A structured digital financial database increases data reliability, improves transparency for donors and stakeholders, strengthens internal controls, and reduces the risk of fraud. These findings support Maulana (2019:55), who argues that digital systems in religious institutions lead to measurable improvements in accountability, trust, and organizational credibility.

3.3 Prototype Database Modeling for Pesantren Financial Records

Field observations show that shifting from manual bookkeeping to a digital system should begin with clear mapping of core data elements. These include transaction entities, chart of accounts, funding sources (donations, infaq, waqf, tuition), activity units (education, dormitory, business units), transaction evidence, and system users such as treasurers, administrators, and internal auditors. This step is consistent with studies emphasizing that clear requirement definition is essential before system development to ensure standardized financial outputs (Nurlaily:31, 2024; Absari:68, 2024).

Based on document analysis and interviews, the appropriate database model for Darul Arqam Gombara Islamic Boarding School is a relational structure consisting of several main tables. These include Chart of Accounts, Transactions, Donors/Funders, Units or Programs, Documents, and Users with defined roles and permissions. This structure supports audit trails, cross-entity references, and reduced data redundancy, as recommended in nonprofit accounting information system literature (Supriyati & Bahri:151, 2020; Nugroho:93, 2021).

The entity–relationship design shows one-to-many relationships between Chart of Accounts and Transactions, Donors and Transactions, Units and Transactions, and Transactions and supporting Documents. Normalization to third normal form (3NF) is applied to avoid update anomalies and to maintain historical consistency. This approach is especially important for pesantren that require periodic and reconciled financial reporting (Mu'alina:23, 2023). Normalization also facilitates the migration of data from multiple handwritten cashbooks into a single structured transaction table.

Recent studies highlight that audit metadata—such as created_by, created_at, approved_by, approved_at, and optional identifiers like IP address or device ID—are critical for ensuring traceability and accountability (Absari:72, 2024; Nurlaily:31, 2024). Therefore, the prototype incorporates standard audit fields in each transaction record.

A key design objective is enabling the automatic generation of nonprofit-standard financial statements, including PSAK-based reports. The Statement of Financial Position is produced through structured account coding, the Statement of Activities is generated from revenue and expense classifications linked to programs or units, and the Statement of Cash Flows is derived from cash-related transactions. This design ensures that system outputs are suitable for audits, donor reporting, and regulatory compliance (Paramita:76, 2020; Supriyati & Bahri:160, 2020).

Data migration is conducted in three stages: extraction of manual records, transformation through standardization and data cleaning, and loading into the Transactions table. Field findings reveal frequent inconsistencies in handwritten dates, descriptions, and document numbering, making data cleansing a critical step (Latifa:45, 2020). Each migrated record is also marked with a source indicator to preserve an auditable migration trail.

The prototype was validated through laboratory-based simulations using common pesantren transactions, such as student fundraising, routine donations, and operational expenditures. The results show that the system successfully generates balance sheets, program activity reports, and cash flow statements with higher accuracy than manual summaries (Mu'alina:23, 2023; Supriyati & Bahri:159–162, 2020).

Several implementation challenges were identified, including poor initial data quality, limited staff digital literacy, infrastructure constraints, and the need to adapt pesantren-specific accounting terms such as waqf and designated donations. Recent studies recommend a phased implementation strategy involving pilot testing, continuous training, and ongoing technical

support to address these challenges and ensure system sustainability (Nurlaily:31, 2024; Nugroho:112, 2021).

Overall, the proposed database prototype adopts a relational structure with audit metadata, access controls, and a standardized chart of accounts to support reliable nonprofit financial reporting. Successful implementation depends on structured data migration, strong internal controls, and staff capacity building. Previous studies confirm that clear data modeling significantly accelerates improvements in accountability and governance in nonprofit institutions (Absari, 2024; Supriyati & Bahri, 2020; Mu'alina, 2023).

3.4 Identification of Required Financial Reports Based on Accounting Standards

Field data show that pesantren using manual bookkeeping are unable to produce complete and standardized financial statements. Most pesantren only prepare simple cash-in and cash-out notes without classification by account type, program activity, or funding source. This condition is consistent with findings that manual bookkeeping in nonprofit organizations often results in incomplete reporting and difficulties in meeting regulatory requirements (Paramita:72, 2020).

These limitations indicate the urgency of adopting financial reporting formats aligned with nonprofit accounting standards, particularly PSAK 45 (Financial Reporting for Nonprofit Entities) and PSAK 109 for zakat, infaq, and sadaqah management. Without standardized classifications, pesantren face difficulties in presenting their financial position, changes in net assets, and program accountability (Nugroho:87–88, 2021).

Based on document analysis and interviews, the future digital system must generate several key financial reports. The first is the Statement of Financial Position (Balance Sheet), which requires structured classification of assets, liabilities, and net assets. Manual records generally lack asset registers, making reconciliation difficult. Previous studies confirm that digital accounting systems significantly improve asset tracking and valuation accuracy in nonprofit institutions (Wibowo:33, 2020).

The second required report is the Statement of Activities, which presents surplus or deficit and changes in net assets. Pesantren manage multiple programs, such as education, dormitory operations, religious activities, and business units. However, manual records often fail to distinguish revenues and expenses by program. Nonprofit entities are required to separate unrestricted, temporarily restricted, and permanently restricted net assets to ensure transparency (Paramita:80, 2020).

The third is the Statement of Cash Flows. As pesantren transactions are largely cash-based, this report is essential for stewardship and operational planning. Manual bookkeeping frequently results in inconsistent classification of operating, investing, and financing activities. Digital systems support proper categorization and improve internal decision-making (Saputra:41, 2020).

In addition, Notes to the Financial Statements are necessary to explain accounting policies, funding sources, depreciation methods, donor restrictions, and waqf management. Manual systems tend to omit such disclosures, which limits financial interpretation. Research shows that notes are critical for donors and auditors to assess compliance with sharia principles (Mu'alina:26, 2023).

Pesantren also have distinctive financial characteristics related to religious funds. Therefore, several additional reports are required. The first is the Waqf and Philanthropy Fund Report, as mandated by PSAK 109, which records the collection, utilization, and remaining balances of waqf, zakat, infaq, and sadaqah. Manual systems often mix philanthropic and operational funds,

reducing accountability. Separating religious funds has been shown to strengthen donor trust (Nurlaily:29, 2024).

The second is Program-Based Accountability Reports, which present financial performance by program, such as education, tahfiz, dormitory management, and community services. Program-based reporting improves transparency and resource allocation efficiency in nonprofit organizations (Rahayu:55, 2018). The third is the Budget Realization Report (RAB versus actual), as manual systems make budget control weak due to fragmented records. Digital systems enable real-time comparison between planned and actual expenditures, supporting evidence-based decision-making and reducing overspending risks (Hasan:44, 2019).

Identifying these reporting requirements strengthens the rationale for database structuring. Reporting standards determine account categories, program and unit tables, donor restriction tags, asset registers with depreciation tracking, and transaction-type classifications for cash flow reporting. Consequently, financial reporting needs serve as the blueprint for system architecture.

Overall, these findings confirm that pesantren must move beyond basic cashbook-based recording toward standardized nonprofit financial reporting. Manual systems are insufficient to meet the needs of donors, regulators, and internal management. Digitalization enables pesantren not only to comply with accounting standards but also to fulfill ethical and religious obligations for transparency and accountability (Nurlaily:30, 2024).

3.5 Implementation of Digital Recording Mechanisms and Comparison with Manual Methods

The implementation of digital financial recording mechanisms in pesantren generally consists of four main components: (1) the development of a standardized chart of accounts and transaction coding system; (2) digital input modules for receipts, disbursements, and journal entries; (3) digital storage of transaction evidence, such as scanned receipts and uploaded documents linked to each entry; and (4) automated reporting features that generate standard financial statements and special-purpose reports, including zakat, waqf, and donation reports. This structure follows best practices in nonprofit and education-based Accounting Information System (AIS) development, where data structure and document integrity are key priorities (Permatasari: 47, 2024).

Field findings show that pesantren applied a phased implementation approach. This approach included requirement analysis based on existing manual records, the design of a simplified and pesantren-relevant chart of accounts, preparation of digital transaction input templates (such as Excel macros, Google Forms, or simple applications), limited pilot migration of historical data, user acceptance testing with treasurers, and training and system socialization. This step-by-step strategy aligns with digital system deployment models that aim to reduce resistance and minimize early-stage errors (Mu'alina: 112, 2023).

Digital systems introduce validation features that are not available in manual methods, including automatic date checks, numeric validation, debit–credit balancing, duplicate document detection, and multi-level approval workflows. Uploaded transaction evidence is embedded with metadata, such as the uploader and timestamp. These controls significantly reduce input errors and improve reconciliation accuracy (Absari: 68, 2024).

Laboratory-based operational comparisons between manual and digital systems show clear differences in time, accuracy, and auditability. Manual report preparation requires days or weeks due to data consolidation from multiple records, while digital systems can generate reports within hours when transactions are recorded consistently. Similar efficiency gains have been reported in

educational institutions and Islamic boarding schools after adopting digital systems (Arbitrase Journal: 99, 2024).

In terms of accuracy and consistency, automated calculations and standardized coding reduce classification errors commonly found in manual bookkeeping. Prototype testing confirmed a substantial decline in arithmetic and classification errors (Mu'alina: 115, 2023). Regarding audit trails, manual records allow undocumented revisions, whereas digital systems provide activity logs that record who entered, reviewed, and approved each transaction. This strengthens both internal and external audits and supports verification for donors and stakeholders (Permatasari: 25, 2024). Overall, these efficiency improvements support the argument that increased transparency leads to more efficient resource use, particularly in nonprofit and faith-based institutions (Valencia et al., 2014).

Quantitative evaluation results further demonstrate the superiority of the digital prototype over manual recording. Average transaction input time decreased from approximately five minutes to around one and a half minutes, representing a reduction of about 70%. Errors caused by calculation and classification inconsistencies were reduced to near-zero levels through input validation controls. Data duplication, which occurred occasionally in manual systems, was completely eliminated. In addition, report generation time declined from approximately 80 minutes to about 10 minutes, an efficiency gain of nearly 87.5%. Record completeness also improved, as all required data fields were enforced programmatically. These findings are consistent with previous studies (Alotaibi & Liu, 2022; Coupet & Berrett, 2019).

Digitalization also changes the role of the treasurer. Routine manual tasks, such as summation and monthly reclassification, are reduced, while responsibilities shift toward data validation and system operation. As a result, digital literacy becomes essential. Field observations indicate that continuous training is necessary, as the absence of training increases the risk of system misuse, errors, and resistance (Saputra: 130, 2020).

Despite its advantages, several challenges emerged during implementation preparation. These include poor-quality historical records that slow data cleansing, infrastructure limitations such as unstable internet access and inadequate scanning devices, cultural resistance to transparency and technology, uneven digital skills among staff, and the absence of formal governance policies for digital files and authorization. Similar barriers have been identified in studies on digital payments and fintech adoption in Islamic boarding schools (Zulmi: 77, 2025).

Successful pesantren cases consistently apply several good practices. These include starting with basic modules before expanding to a full AIS, using familiar tools prior to introducing specialized applications, conducting limited pilot tests, providing continuous training and simple user manuals, implementing routine backup and file retention policies, and involving pesantren leaders early to support cultural adaptation. These practices are in line with recommendations from digital implementation studies in nonprofit education institutions (Absari: 73, 2024).

Overall, digital systems outperform manual bookkeeping in terms of transparency, speed, audit readiness, and error reduction. However, their effectiveness depends on implementation quality, data preparation, staff training, infrastructure stability, and governance strength. Digitalization should therefore be integrated into organizational culture and competency development to build trust and sustain accountability, rather than treated as a standalone technical solution (Elbanna et al., 2021; Bachmann et al., 2015; Permatasari, 2024).

3.6 The Impact of Financial Digitalization on the Improvement of Pesantren Accountability

The transition from manual bookkeeping to a digital financial system significantly improves transparency in pesantren financial management. Digital records allow all transactions—income, expenses, donor contributions, and program expenditures—to be systematically recorded and easily accessed. This contrasts with manual records, which often contain missing entries, inconsistent formats, and unclear classifications. Digital systems therefore provide clearer and more traceable financial information, strengthening stakeholder trust (Saputra: 49, 2020). This transparency is particularly important for pesantren, which depend heavily on community donations and religious funding. Interviews at Darul Arqam Gombara Islamic Boarding School showed difficulties in demonstrating accountability due to incomplete manual records. Digitalization addresses this issue through transaction verification, standardized categories, and time-stamped documentation that support audit readiness (Wibowo: 37, 2020).

Digital financial systems also strengthen internal control and financial integrity. Manual bookkeeping generally lacks effective control mechanisms, especially in cash-based operations with limited segregation of duties and no audit trails. These weaknesses increase the risk of misstatements. Digital systems introduce structured workflows, validation rules, access restrictions, and automated activity logs. Such features reduce fraud risk by ensuring secure data storage and traceable user actions (Nugroho: 102, 2021). In pesantren, where financial responsibilities often overlap, digital controls clarify roles and link each transaction to specific programs or authorized personnel. These mechanisms support the Islamic principles of *amanah* (trustworthiness) and accountability to Allah SWT, the community, and regulatory authorities.

Accuracy and reliability of financial reporting also improve through digitalization. Manual systems are prone to calculation errors, inconsistent classifications, and delays in report preparation. Digital systems reduce these problems through automated calculations, embedded accounting logic, and standardized formats aligned with PSAK 45 and PSAK 109. Digital reporting tools have been shown to enhance the accuracy and comparability of nonprofit financial statements (Paramita: 84, 2020). Field evidence further indicates that digital systems enable the timely production of monthly or quarterly reports, whereas manual systems often result in delayed or incomplete annual reports. This improvement is critical as pesantren increasingly interact with auditors, donors, and government agencies that require reliable financial information.

Digitalization also supports better decision-making and strategic planning. Unlike manual cash books that require lengthy consolidation, digital systems provide real-time financial data. Dashboards and automated summaries allow pesantren leaders to monitor cash flow, evaluate budget realization, and assess program funding needs. Delays inherent in manual systems hinder effective decision-making in nonprofit institutions (Hasan: 44, 2019). Digital systems therefore help pesantren allocate resources more efficiently, plan educational programs, and manage donor funds responsibly.

In addition, digital systems strengthen accountability to donors, government bodies, and the wider community. Given their religious mission, pesantren face strong moral and social expectations. Digital financial records enable the production of clear and auditable reports that demonstrate responsible fund management. Transparent reporting has been shown to enhance legitimacy and institutional credibility in faith-based organizations (Maulana: 58, 2019). Outputs such as donor reports, zakat utilization statements, and program expenditure summaries directly support trust and Sharia-compliant financial ethics.

Digitalization also aligns with Islamic principles of accountability, particularly *amanah* and *muhasabah*. By ensuring that all financial activities are accurately recorded and transparently

reported, digital systems support ethical self-assessment and responsible stewardship. Research on Islamic nonprofit accountability shows that technology-assisted transparency reflects the Qur'anic principle of documenting transactions for fairness and clarity (QS. Al-Baqarah:282) (Mu'alina: 19, 2023). Thus, digitalization represents both a technical improvement and a reinforcement of Islamic ethical values.

Overall, digital financial management in pesantren results in higher transparency and donor trust, stronger internal control, more accurate and timely financial reports, improved budgeting and resource allocation, better compliance with PSAK 45 and PSAK 109, and enhanced governance sustainability. These findings confirm that digital transformation is a strategic necessity for pesantren seeking to strengthen accountability and institutional integrity.

4. CONCLUSION

This study concludes that manual financial recording practices in pesantren are generally fragmented, paper-based, and prone to inconsistencies, resulting in delays and limited transparency. Transforming these manual records into a digital financial database requires systematic steps, including data classification, chart-of-accounts structuring, transaction coding, and the development of a prototype aligned with the operational characteristics of pesantren. The resulting digital data model provides a structured foundation that supports compliance with nonprofit accounting standards by enabling standardized reporting formats, automated classification, and enhanced data integrity.

Furthermore, the findings demonstrate that digital transformation has substantial implications for strengthening financial accountability in pesantren. Digital systems improve accuracy, traceability, timeliness, and stakeholder visibility, thus reinforcing internal control and governance practices. Based on these outcomes, several recommendations emerge: pesantren should adopt standardized accounting frameworks, prioritize staff training in digital financial systems, establish clear documentation procedures, and gradually integrate automated reporting tools to ensure sustainable and accountable financial management.

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