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Optimization of Digital Accounting Transformation in Village-Owned Enterprises Using a Value Chain Perspective for Good Village Governance

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ABSTRACT

This study examines how accounting practices in Village-Owned Enterprises (BUMDes) transform from manual bookkeeping to digital systems using a value-chain perspective. It addresses the core problem of misalignment between the formal logic of accounting applications and the cash-flow-based working logic of BUMDes operators, which leads to hybrid adoption, partial use of the system, and continued reliance on manual records that weaken accountability and decision making. A qualitative exploratory case-study design was applied in two BUMDes in East Java, using interviews, observations, document analysis, and focus group discussions analyzed through a value-chain framework. The findings show that digital applications are positioned mainly at the downstream reporting stage, while upstream transaction capture and processing remain manual, making hybrid adoption and workflow-system misalignment a structurally stable pattern shaped by cognitive, capability, and infrastructural constraints. The study proposes a value-chain-based, user-driven transformation model using a Minimum Viable Product (MVP) that accepts simple cash inputs, automates journal mapping, and produces contextual, offline-friendly reports, contributing to the discourse on human-system fit in rural digital transformation and offering practical guidance for BUMDes-oriented accounting system design.

Keyword: BUMDes; digital accounting; governance; system adoption; value chain

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INTRODUCTION

Digital transformation in village financial governance has become increasingly critical as Village-Owned Enterprises (Indonesian: Badan Usaha Milik Desa, abbreviated as BUMDes) continue to expand in institutional capacity, operational scale, and financial responsibility. In 2023, there were 60,417 BUMDes, of which approximately 41,000 were active, and this number increased to 65,941 in the following year, with 18,850 units legally registered (Afridayani et al., 2025; Revida et al., 2023; Sagala & Siregar, 2023).

However, empirical evidence shows that the transition toward digital financial systems in rural organizations is often constrained by unequal digital readiness, limited infrastructure, user capability gaps, and fragmented implementation frameworks (Chan et al., 2024; Kosasih & Sulaiman, 2024; Mwansa et al., 2025; Purnamasari et al., 2025). In many BUMDes, digital accounting applications are activated mainly at the reporting stage, while day-to-day transactions continue to rely on manual cash books, resulting in incomplete or delayed financial reports that are not fully functional as managerial decision-support tools. The core problem addressed in this study is the misalignment between the formal, journal-based logic embedded in accounting applications and the cash-flow-based working logic of BUMDes operators, which creates a structural gap that inhibits meaningful digital transformation (Abubakari & Namooq, 2023; Jackson & Allen, 2024; Milenia et al., 2023; Quang Huy & Kien Phuc, 2024). This misalignment produces hybrid adoption patterns, partial use of digital systems, and persistent reliance on manual records, which weaken both financial accountability and governance-oriented decision-making.

Prior studies on public-sector and rural digitalization indicate that technology adoption is more likely to succeed when system design aligns with user literacy, workflow patterns, and organizational routines rather than focusing solely on technical sophistication (Deng et al., 2024; He et al., 2025; Mao et al., 2024; Zhang et al., 2025). Research on digital accounting and information systems also emphasizes the importance of human-system fit, perceived usefulness, and ease of use in determining whether technology becomes embedded in everyday practice (Fatimah, Wijayanti, et al., 2024; Fatimah, Dwiandini, et al., 2025; Fatimah, Ernawati, et al., 2025; Widiastuti et al., 2023). Building on these insights, this study adopts a value-chain perspective to examine how manual and digital practices are distributed across stages of transaction capture, processing, consolidation, reporting, and accountability in BUMDes financial management.

Despite growing interest in digital rural governance, research that explicitly traces transaction flows and value-chain activities in BUMDes as the basis for digital accounting transformation remains limited (Fatimah, Wijayanti, et al., 2024; Fatimah, Dwiandini, et al., 2025; Fatimah, Ernawati, et al., 2025; Widiastuti et al., 2023). Existing studies tend to focus on system implementation outcomes or reporting quality, but provide insufficient empirical explanation of how user literacy, workflow behavior, and reporting expectations interact with the technical logic embedded in accounting applications at the level of system design and everyday practice (Abubakari & Namooq, 2023; Jackson & Allen, 2024; Milenia et al., 2023; Quang Huy & Kien Phuc, 2024). There is also a lack of analytical models that link these interactions to concrete pathways for repositioning digital systems along the value chain in rural enterprises (Halim, 2023). This study addresses these gaps by analyzing digital accounting transformation in BUMDes at the level of workflow practices and system interaction, and by developing a value-chain-based transformation model grounded in empirical evidence from BUMDes cases.

The novelty of this study lies in three main elements. First, it conceptualizes digital accounting transformation in BUMDes as a dual-track configuration in manual upstream, digital downstream, and uses a value-chain lens to map this distribution systematically across financial activities (Fatimah, Wijayanti, et al., 2024; Fatimah, Dwiandini, et al., 2025; Fatimah, Ernawati, et al., 2025; Widiastuti et al., 2023). Second, it develops a user-driven transformation model that adopts a Minimum Viable Product (MVP) approach, accepting simple cash-mode inputs and translating them into automated journals and adaptive financial reports that remain simple, contextual, and offline-friendly in line with rural infrastructure conditions. Third, it advances the discourse on human–system fit in rural digital transformation by framing the proposed model as an analytically generalizable pathway that can inform the design of BUMDes-oriented accounting systems aimed at strengthening transparency, accountability, and governance-oriented decision-making.

RESEARCH METHOD

This study adopts an exploratory qualitative case-study approach to examine how digital accounting transformation emerges within the everyday workflows and value-chain activities of BUMDes organizations. The qualitative approach enables an in-depth understanding of meanings, interactions, and practices that occur in real organizational settings, rather than merely capturing numerical outcomes (Fikri et al., 2025). The case-study design provides a detailed and holistic description of the transformation process as it is experienced by users within their institutional context. The aim of this design is analytical rather than statistical generalization, namely to develop an empirically grounded explanatory model that can inform similar rural digital accounting settings (Donkoh, 2023).

The research was conducted in two BUMDes in East Java that are in the process of transitioning from manual bookkeeping to digital accounting applications. These cases were selected purposively because they represent typical village-enterprise contexts where digital accounting systems have been introduced, but manual routines remain strongly embedded in daily work (Fatimah, Ernawati, et al., 2025). The selection therefore emphasizes analytical relevance, allowing the study to trace workflow–system interactions in depth rather than to achieve statistical representativeness across all BUMDes.

The scope of analysis includes: (1) transaction-recording practices, (2) workflow patterns along the financial value chain, (3) user interactions with the digital system, and (4) the alignment between reporting needs and the technical logic of the application. Data were collected between January and September 2025 through multiple qualitative techniques consistent with established methodological guidance (Fatimah, Nurindrasari, et al., 2024; Fikri et al., 2025).

These techniques consist of: (1) in-depth interviews with treasurers, managers, supervisors, and system operators to obtain interpretations, experiences, and decision routines related to financial recording; (2) observation of transaction flows and recording activities to trace how financial information moves across stages of the value chain; (3) document analysis of cash books, financial statements, and application-generated reports; and (4) Focus Group Discussions (FGDs) to refine interpretations of workflow–system alignment. In total, the study involved approximately 10 informants across the two BUMDes, covering key roles in financial management and system operation.

To ensure the credibility of the findings, this study applies method triangulation, namely the process of comparing and integrating results obtained from different data-collection techniques and participant perspectives, so that the conclusions produced are more valid and trustworthy (Donkoh, 2023). Triangulation was implemented by cross-checking interview narratives with observational evidence and archival documents. In addition, preliminary value-chain mappings and interpretive

summaries were presented back to key participants through FGDs as a form of member checking, enabling informants to confirm, clarify, or challenge the researchers' interpretations (Fatimah, Sari, et al., 2024).

Data analysis was conducted using a value-chain-based analytical framework. Each stage of activity—transaction capture, processing, consolidation, reporting, and accountability—was mapped against user behavior and system functionality (Prasetianingrum & Sonjaya, 2024). The analysis followed an iterative process of coding, pattern matching, and explanation building, allowing the researchers to identify areas of misalignment between system logic and user practices and to interpret how these misalignments influence the effectiveness of digital accounting adoption (Halim, 2023; Jackson & Allen, 2024). The results of this analytical process form the basis for the formulation of a MVP-oriented, user-driven digital accounting transformation model that emphasizes simplicity, contextual usability, and governance-oriented reporting. This model is proposed as an analytical generalization derived from the studied cases, not as a universal prescriptive blueprint for all BUMDes.

RESULTS AND DISCUSSION

Empirical Results: Value-Chain Mapping Context

The empirical results are first examined through a value-chain mapping that positions financial activities across the stages of transaction capture, processing, consolidation, reporting, and accountability. The mapping shows that daily financial work in the BUMDes cases is still governed by a cash-flow-based operational logic, in which transactions are recorded immediately in manual cash notes, while the digital accounting application appears only at later stages of the activity flow. Rather than functioning as an integral part of the operational process, the system is positioned primarily as a mechanism for formalizing outputs when reports are required for administrative or accountability purposes.

This configuration can be seen in the pattern of interaction between workflow practices and system use, which is summarized in the table below.

Table 1. Value-chain mapping of financial activities and recording practices

Value-Chain Stage	Observed Activity	Recording Practice	System Interaction	Implication
Transaction Capture	Cash receipts and disbursements	Manual cash notes	Not used	Operational routines remain manual
Processing	Grouping and recapping transactions	Notebook/sheets	Selective and occasional	Risk of omission and delay
Consolidation	Period-end compilation	Manual rewriting	Entered when reports are needed	System use is episodic
Reporting	Formal financial statements	Application output	Highly operator-dependent	System functions as reporting tool
Accountability Use	Submission to village stakeholders	Printed or verbal report	No real-time access	Limited managerial and learning value

Source: (Fatimah, Ernawati, et al., 2025)

The table indicates that digitalization does not replace manual routines in the upstream stages of transaction capture and processing, but enters the process downstream, at the point where financial

information is formalized for external reporting. Transactions are produced and interpreted manually, while the system is activated retrospectively to generate structured statements. As a result, digitalization reshapes how financial data are presented rather than how financial work is actually produced, and the application functions more as a reporting device than as an operational tool.

Hybrid Adoption and Workflow–System Misalignment

The empirical findings show that the transition from manual bookkeeping to digital accounting does not occur as a linear substitution of practices, but evolves into a hybrid adoption pattern in which manual and digital routines coexist within the same workflow. In day-to-day operations, transactions continue to be recorded first in manual cash notes because this medium is experienced as faster, more flexible, and cognitively aligned with the users' cash-flow-oriented way of working. The digital application is activated only after these manual records have accumulated, typically at the end of the reporting period, when financial information must be compiled for administrative or accountability purposes (Milenia et al., 2023; Quang Huy & Kien Phuc, 2024).

This sequencing creates a temporal and structural separation between where work is performed and where the system operates. Financial activities are generated and interpreted at the point of transaction capture and processing, yet the application intervenes only during consolidation and reporting, when transactions must already be reconstructed into journal structures and account-code categories. Users therefore experience the system less as a real-time support tool and more as a mechanism that requires them to re-enter, reinterpret, and formalize information that has already been processed manually.

These dynamics are reinforced by a cognitive gap between cash-flow logic and journal-based system logic, which produces hesitation and uncertainty when users attempt to enter transactions directly into the application. To minimize perceived risk of error, users develop compensatory routines in which manual recording becomes the primary working medium, while the system is engaged retrospectively and sometimes only partially. Over time, this arrangement stabilizes into a division of roles between media in manual for everyday work, digital for formal compliance—rather than representing a temporary adjustment during transition (Abubakari & Namooog, 2023; Jackson & Allen, 2024). Consequently, digitalization does not transform the underlying workflow; instead, it consolidates as a post-hoc administrative layer that formalizes outputs without reshaping the processes through which financial work is produced.

Application–User Fit and Organizational Capacity Risks

The persistence of hybrid adoption is closely tied to the limited degree of fit between the application's technical logic and the users' cognitive and organizational capacities. Although the system is functionally available, its interface assumes familiarity with journal structures, account coding, and sequential data-entry procedures that do not correspond with how users conceptualize financial work in practice. Interaction with the application is therefore experienced as cognitively demanding, especially when transactions must be categorized, edited, or corrected within the system environment (Halim, 2023; Ringan et al., 2025).

The synthesis in Table 2 shows that digital competence is often concentrated in a single operator, who becomes the only person able to use the system with confidence. When this actor is unavailable or replaced, digital recording activities temporarily cease and the organization reverts fully to manual routines. Digitalization thus remains attached to individual expertise rather than evolving into a shared institutional capability, and manual records continue to function as the primary and most trusted

financial reference. These conditions normalize selective and episodic system use and reinforce the dominance of manual workflows in everyday practice.

Table 2. Application–user fit and organizational capacity risks

Evidence Dimension	Field Observation Pattern	Implication for System Use	Analytical Interpretation
Cognitive compatibility	Users conceptualize transactions as simple cash flows.	Users experience difficulty interacting with account codes and journal formats.	The application logic exceeds users' operational logic.
Interaction behavior	Transactions are entered only after manual recording.	Data entry remains selective and delayed.	The system functions retrospectively rather than operationally.
Role distribution	One operator masters the application.	The system becomes inactive when the operator is unavailable.	Capability remains concentrated rather than institutionalized.
Learning environment	No sandbox or safe experimentation space is available.	Users exhibit fear of error and avoid direct system entry.	Users prioritize certainty over system immediacy.
Organizational continuity	Manual records remain the primary reference.	Digital records depend on episodic activation.	Manual workflows remain dominant in everyday practice.

Source: (Fatimah, Ernawati, et al., 2025)

These dynamics resonate with broader findings in digital-adoption research, where perceived usefulness, ease of use, and digital literacy play a decisive role in determining whether technology becomes embedded in everyday practice (Jackson & Allen, 2024; Ringan et al., 2025). When systems demand cognitive effort that exceeds users' competencies or habitual work logic, adoption tends to stabilize as selective, episodic, and role-dependent rather than continuous and organization-wide. In the BUMDes cases, users maintain manual routines not because they reject innovation, but because these routines provide certainty, control, and operational reliability under conditions of limited capability and uneven competence distribution.

Value-Chain–Based Interpretation of Digital Transformation Outcomes

Viewed through the value-chain lens, hybrid adoption and workflow–system misalignment are not randomly distributed across activities, but are structured by the downstream positioning of the digital system within the chain of financial processes. In the upstream stages of transaction capture and processing, financial work relies on immediacy, familiarity, and embodied interaction with cash-flow information, making manual cash notes the most compatible medium because they permit flexible interpretation, rapid correction, and personalized control over data. At this point in the chain, digitalization does not shape how financial value is produced; it remains peripheral to the moment in which operational meaning is constructed (Prasetianingrum & Sonjaya, 2024).

By contrast, the application becomes more visible in the stages of consolidation and reporting, where financial information is reconstructed into structured outputs to meet administrative and accountability requirements. In these stages, the system functions primarily as a retrospective formalization instrument, activated after transactions have already been produced and interpreted manually. This pattern aligns with broader observations in digital-accounting literature, where technology integration often begins at the reporting layer and gradually moves upstream only when

organizational capability, user literacy, and workflow alignment increase (Halim, 2023; Prasetianingrum & Sonjaya, 2024).

The value-chain perspective also clarifies why this configuration becomes institutionally stable rather than temporary. Limitations in supporting activities—such as infrastructure reliability, competence distribution, and contextual adaptation of technology—reinforce the separation between manual upstream practice and digital downstream formalization. Similar to findings in studies of public-sector and SME accounting systems, digital tools tend to consolidate in administrative zones when technical logic advances faster than practice-level capability and organizational learning (Halim, 2023). In this situation, hybrid adoption emerges not as resistance to innovation, but as a rational organizational strategy that protects workflow continuity while meeting formal reporting expectations.

Value-Chain Synthesis Table and Integrative Discussion

Table 3. Value-chain components and digital transformation implications

Value-Chain Component	Field Evidence Pattern	Effect on System Use	Integrative Interpretation
Transaction Capture (Inbound / Upstream)	Transactions are initially recorded in manual cash notes.	The system is not utilized at the point of capture.	Digitalization remains absent at the stage where value is first created.
Processing & Recap (Operations)	Data are rewritten and grouped before entry.	Entry into the system is delayed and selective.	A cognitive gap persists between cash-flow logic and journal-based logic.
Consolidation (Outbound / Mid-stream)	The application is activated during month-end compilation.	Technology enters late in the workflow.	The system formalizes outputs rather than shaping operational processes.
Reporting (Administrative Layer)	The system generates structured financial statements.	Operation remains highly dependent on individual operators.	Digitalization stabilizes as a compliance-oriented instrument.
Accountability & Public Forums (Service)	Reports delivered verbally, low interpretation	Limited transparency comprehension	Information legitimizes reporting more than learning
Firm Infrastructure (Support)	Devices are limited and connectivity is unstable.	Digital use remains discontinuous.	Infrastructure conditions reinforces hybrid adoption.
Human Resource Management (Support)	Competence is concentrated in a single operator.	The system becomes unstable when roles change.	Capability remains individual rather than institutional.
Technology Development (Support)	System features are fixed and not adapted to workflow needs.	Contextual usability remains low.	Technology evolves more slowly than organizational practice.
Procurement / Technical Support (Support)	Training is provided without iterative mentoring.	Learning does not mature.	Adoption becomes episodic rather than cumulative.

Source: (Fatimah, Ernawati, et al., 2025)

The value-chain synthesis reinforces that hybrid adoption and workflow–system misalignment follow a patterned rather than random distribution across activities. In the upstream stages of transaction capture and processing, manual routines dominate because they provide immediacy, flexibility, and cognitive compatibility with the way users interpret cash-flow information in practice. Digitalization enters primarily at the reporting layer, where it functions as a retrospective formalization mechanism rather than as a process-shaping tool. Similar outcomes have been identified in broader digital-accounting research, where technology tends to consolidate first within administrative domains before gradually engaging operational workflows when capability and alignment increase (Prasetianingrum & Sonjaya, 2024).

This pattern becomes institutionally stable because key support-activity components including infrastructure reliability, competence distribution, and adaptive technology development do not evolve at the same pace as system introduction. As earlier studies on implementation barriers also note, digital transformation is constrained not only by technical limitations but by the organizational capacity to internalize new work logic, leading to selective and episodic system use (Halim, 2023). In this sense, the coexistence of manual upstream practice and digital downstream formalization is not a transitional anomaly, but a rational organizational strategy that protects workflow continuity while fulfilling accountability requirements.

Read through this matrix, the value-chain perspective reveals that digital transformation does not fail because users reject technology, but because technology is positioned structurally at the downstream end of the chain, where activities shift from doing to reporting. Financial value is created upstream in the capture and processing of transactions, yet the application intervenes only after those activities have already taken place. Consequently, the system becomes detached from the sites where meaning, judgment, and operational decisions are produced and instead as a retrospective formalization layer.

At the same time, the support-activity layer explains why this downstream positioning becomes stable rather than temporary. Concentrated expertise, limited infrastructure, and non-adaptive technology design collectively normalize selective and episodic use. Manual routines remain central not because they are traditional, but because they provide continuity, reliability, and cognitive compatibility within everyday work. In this sense, hybrid adoption emerges as a rational organizational strategy, allowing the institution to protect workflow stability while fulfilling formal accountability expectations through the digital system.

The synthesis, therefore, strengthens the interpretation that digitalization in BUMDes evolves into a dual-track configuration—manual upstream and digital downstream—reflecting the organization’s logic of practice rather than the formal logic of the application. This conclusion provides the conceptual bridge to the next section, where the findings are translated into an MVP-based transformation pathway that aims to reposition technology earlier in the chain while preserving usability, contextual relevance, and institutional capability development.

Evidence-Based MVP Transformation Pathway

Building on the synthesis above, the findings indicate that meaningful digital transformation in BUMDes cannot be achieved by merely extending or intensifying system use at the reporting layer. Instead, transformation must be approached as a progressive repositioning of technology along the value chain, beginning from the points where financial value is first produced and gradually moving downstream toward consolidation and accountability. This logic forms the basis for an MVP-based transformation pathway that aligns technological development with the empirical realities of workflow, literacy, and institutional capacity.

The pathway begins with an entry-stage MVP that accepts cash-mode inputs as a legitimate starting point rather than treating them as transitional or erroneous practice. At this stage, the system is designed to support simple, familiar transaction capture, while automated journal mapping operates in the background. In doing so, the application does not require users to abandon their existing cash-flow logic; instead, it translates that logic into accounting structures without disrupting cognitive habits or operational rhythm.

In the next stage, the MVP evolves to strengthen mid-stream processing and interpretation, enabling users to gradually engage with categorized data, verification prompts, and semi-structured summaries. Rather than imposing full accounting complexity at once, the system introduces progressive literacy scaffolding, allowing capability to develop through repeated interaction with meaningful tasks. As competence becomes more distributed across roles, digital practices begin to shift from individual expertise toward institutional capability.

Only after upstream and mid-stream integration is achieved does the MVP expand toward adaptive reporting and governance-oriented accountability. At this stage, the system produces outputs that combine formal financial statements with interpretive visual-narrative representations, enabling both internal decision-making and public transparency. The emphasis moves from simply generating compliant reports to supporting learning-oriented accountability, where financial information can be discussed, interpreted, and reflected upon by multiple stakeholders.

From this perspective, the MVP does not represent a reduced or simplified version of a full system, but a context-sensitive transformation pathway grounded in empirical evidence. By repositioning technology earlier in the value chain, supporting progressive capability formation, and preserving usability within local work practices, the pathway aims to convert fragmented, downstream-oriented digitalization into a gradually integrated, process-oriented transformation that strengthens both operational practice and governance in BUMDes financial management.

CONCLUSION

This study examined the dynamics of digital accounting transformation in BUMDes by analyzing how financial activities, recording practices, and system interaction are distributed along the value chain. The findings show that digitalization does not replace manual routines in a linear manner, but instead stabilizes as a hybrid configuration in which manual processes dominate the upstream stages of transaction capture and processing, while the accounting application operates mainly in the downstream stages of consolidation and reporting. In this arrangement, the system functions primarily as a retrospective formalization layer, generating structured outputs without intervening in the production of financial work itself.

The study further demonstrates that this configuration is shaped by a combination of cognitive, organizational, and infrastructural conditions. Gaps between cash-flow-based work logic and journal-based system logic, the concentration of digital competence in a single operator, and limited institutional learning capacity collectively sustain selective and episodic system use. Rather than reflecting resistance to innovation, the persistence of manual routines represents a rational adaptation strategy that preserves workflow certainty under constrained capability conditions.

Viewed through the value-chain perspective, these findings advance existing debates on digital accounting adoption by showing that transformation outcomes are not determined solely by technology availability, but by where technology is positioned within the chain of activities. The study contributes theoretically by conceptualizing digitalization in rural-organizational contexts as a dual-track process, manual upstream, digital downstream, and by highlighting workflow-system misalignment as a structural, rather than incidental phenomenon.

At the practical level, the results inform a pathway for evidence-based, MVP-oriented transformation, in which technology is progressively repositioned from the reporting layer toward earlier stages of the value chain, while supporting gradual capability development and maintaining usability within existing work practices. This approach shifts the emphasis from enforcing full system adoption to building integration incrementally through contextual alignment.

Finally, the study opens avenues for future research, including comparative analysis across different BUMDes models and longitudinal evaluation of MVP-based integration strategies. Such work would help deepen understanding of how digital accounting systems can evolve from administrative instruments into embedded components of everyday financial practice in community-based organizations.

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