

Applied Informatics in SME Digital Transformation: Integrating Bai Salam Islamic Contracts with Odoo ERP System in the Garment Industry

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ABSTRAK

In the digital transformation era, Small and Medium Enterprises (SMEs) in Indonesia, particularly in the garment sector producing Muslim attire, encounter significant challenges in managing working capital and Sharia-compliant transactions efficiently. Traditional financing often conflicts with Islamic principles prohibiting riba, while manual processes lead to errors, poor transparency, and operational inefficiencies in handling Bai Salam contracts—prepaid forward sales that provide advance capital for production while ensuring fixed prices and specifications. This study applies informatics principles to integrate Bai Salam contracts into the open-source Odoo ERP system at a Bekasi-based garment SME specializing in hijab and gamis. Employing a mixed-methods sequential explanatory design within a single-case descriptive study, researchers customized Odoo modules (e.g., accounting for advance deposits as liabilities, automated inventory and sales integration) to enable real-time tracking, Sharia-compliant reporting per PSAK 103, and seamless transaction automation. The implementation yielded substantial improvements: financial performance ratios rose 13% (from 1.15 to 1.28), attributed to enhanced cash flow predictability and inventory control; transaction errors decreased by 85% through automation eliminating manual discrepancies. E-wallet deposit usage remained stable at 60–68% monthly, supporting proactive production during peak seasons. This research contributes to applied informatics by offering a replicable, informatics-driven model for customizing open-source ERP platforms to support Sharia-compliant financial operations in resource-constrained SMEs, bridging Islamic economic principles with digital tools to foster transparency, efficiency, and sustainable growth in Indonesia's halal fashion ecosystem.

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1. INTRODUCTION

In the era of digital transformation, Small and Medium Enterprises (SMEs) remain the backbone of Indonesia's economy. As of late 2024, Indonesia hosts over 64 million SMEs, contributing approximately 61% to national GDP and employing 97% of the workforce [1]. In the era of digital transformation, Small and Medium Enterprises (SMEs) remain the backbone of Indonesia's economy. As of late 2024, Indonesia hosts over 64 million SMEs, contributing approximately 61% to national GDP and employing 97% of the workforce [2].

This sector requires efficient working capital for upfront material purchases and mass production. Conventional interest-based loans conflict with Islamic principles prohibiting riba (usury). Bai Salam—a Sharia-compliant forward sale contract—offers a viable alternative, enabling advance payment for future delivery of specified goods, thus providing producers immediate capital while securing buyers fixed prices and quality [3]. According to PSAK 103 on Salam Accounting, this contract allows prepaid payments for specified goods, offering certainty in cash flow for production planning [4].

Despite advantages, SMEs adopting Bai Salam face persistent challenges: manual transaction recording, inventory mismanagement, error-prone processes, and limited transparency in Sharia compliance [5]. These issues cause delays, discrepancies, and inefficiencies.

Digitalization via Enterprise Resource Planning (ERP) systems integrates finance, inventory, sales, and production for real-time management and decision-making [6]. Open-source platforms like Odoo suit resource-constrained SMEs due to modularity, customizability, and low cost [7]. A Bekasi-based Muslim garment SME exemplifies this: as a pioneer, it integrates Bai Salam via customized Odoo modules for prepaid deposits (recorded as liabilities), automated inventory, and Sharia-compliant reporting [8].

Prior research examines these elements separately. Studies on Bai Salam highlight its role in ethical working capital for manufacturing, especially agriculture and SMEs, but largely in manual or non-digital contexts with limited adoption due to risks and operational challenges [9]. Conversely, ERP studies in Indonesian SMEs demonstrate gains in operational transparency, efficiency, and post-implementation acceptance (e.g., via Odoo in retail or services), yet rarely address Sharia-specific requirements or Islamic finance contracts [10]. Integrated approaches combining Bai Salam with ERP—particularly open-source systems for Sharia-compliant SMEs—remain scarce, especially in Indonesia's growing modest fashion sector [11].

This gap is critical: amid halal ecosystem demands and government digitalization initiatives, Sharia-based SMEs need informatics-driven tools for competitiveness.

This study addresses:

1. How can Bai Salam contracts be implemented and integrated into Odoo ERP as an applied informatics solution for transaction management in garment SMEs?
2. What key challenges arise in ERP customization and adoption for Sharia-compliant operations, including technical and human factors?
3. What practical strategies optimize informatics support for Bai Salam in resource-limited SMEs?

This research advances applied informatics by providing an empirical, replicable model for customizing open-source ERP to embed Islamic finance principles, enhancing transparency, efficiency, and Sharia compliance. Practically, it offers blueprints for Indonesian garment SMEs to achieve ethical digital transformation, supporting halal industry growth and national SME digitalization policies [12]. Ultimately, it bridges informatics technology with Islamic economics for sustainable development in the modest fashion landscape.

2. RESEARCH METHODS

This study employs a mixed-methods sequential explanatory design, with a primary qualitative focus supplemented by quantitative elements to provide empirical validation [13]. This approach suits applied informatics research, as it allows in-depth exploration of ERP system implementation and customization while quantifying impacts on operational performance [14].

The design categorizes as a case study in applied informatics, examining the practical development, deployment, and evaluation of an Odoo ERP system customized for Sharia-compliant transactions in an SME context.

2.1. Research Design and Context

Researchers conduct the study as a single-case descriptive case study at a garment SME in Bekasi, Indonesia, specializing in Muslim apparel (hijab and gamis). This site was selected purposively based on several strategic criteria derived from the original thesis. The SME represents the typical characteristics of the Indonesian Muslim garment industry, where Bai Salam contracts are well-suited for mass production involving standard specifications. Additionally, the SME holds pioneer status in integrating Sharia contracts with ERP systems in its region. The management provided full accessibility to operational, financial, and transactional data, which was essential for rigorous analysis. Furthermore, the company had implemented Odoo ERP for over 12 months prior to the study, allowing for meaningful pre- and post-implementation comparisons. Finally, the business scale was appropriate for detailed examination without overwhelming complexity. This context aligns closely with the goals of applied informatics, emphasizing the real-world deployment of open-source ERP solutions to drive digital transformation in resource-constrained SMEs [6].

Figure 1 illustrates the overall research methodology flow, adopting a **mixed-methods sequential explanatory design** [13]. This approach begins with a quantitative phase to identify patterns and impacts of the implementation, followed by a qualitative phase that explains and interprets the quantitative findings. Integration of both phases is achieved through triangulation to produce a more comprehensive and valid understanding.

The diagram flows from top to bottom as follows:

1. **Overall Research Framework** The study is categorized as an **applied informatics case study** with a single-case descriptive design, focusing on a real-world implementation at a Muslim garment SME in Bekasi that has integrated Odoo ERP with Bai Salam contracts for over 12 months.
2. **Phase 1: Quantitative (Sequential – First Part)** Researchers collected quantitative data directly from Odoo ERP transaction logs and reports, including financial performance metrics (pre- and post-implementation ratios), transaction error rates, and e-wallet deposit usage ratios over a 12-month period (2023–2024). Data were analyzed using descriptive statistics (means, percentages, trends, before-after comparisons). This phase produced key numerical results, such as a 13% improvement in financial performance ratios (from 1.15 to 1.28) and an 85% reduction in transaction errors.
3. **Transition / Connecting Phase** The quantitative findings served as the foundation and guide for deeper exploration in the subsequent phase. Prominent figures (e.g., the 85% error reduction) were used as starting points to investigate “why” and “how” these outcomes occurred.
4. **Phase 2: Qualitative (Explanatory – Second Part)** Qualitative data were gathered through in-depth interviews with SME management and staff, workplace observations, and analysis of internal documents (transaction records, Odoo customization notes). Analysis was conducted using **thematic analysis** with inductive coding to identify recurring patterns related to implementation processes, module customization challenges, digital literacy barriers, and optimization strategies. The output consisted of key themes that explain the mechanisms behind the quantitative figures.
5. **Integration & Final Analysis Phase** Both data types were integrated through **triangulation** (cross-verification) to validate findings and reduce bias. A weighted SWOT analysis was also performed based on the combined quantitative and qualitative data, supplemented by expert judgments. Final interpretation linked quantitative metrics to qualitative explanations—for example, the 85% reduction in transaction errors resulted from automated deposit recording as liabilities and the elimination of manual interventions.
6. **Final Outputs** The study produced a replicable applied informatics model for customizing open-source ERP systems in Sharia-compliant financial contexts, practical strategies for Bai Salam-based SMEs, and contributions to digital transformation within Indonesia’s halal ecosystem.

This flow ensures the research not only describes “what” happened but also explains “why” and “how,” consistent with the characteristics of sequential explanatory design and the objectives of applied informatics.

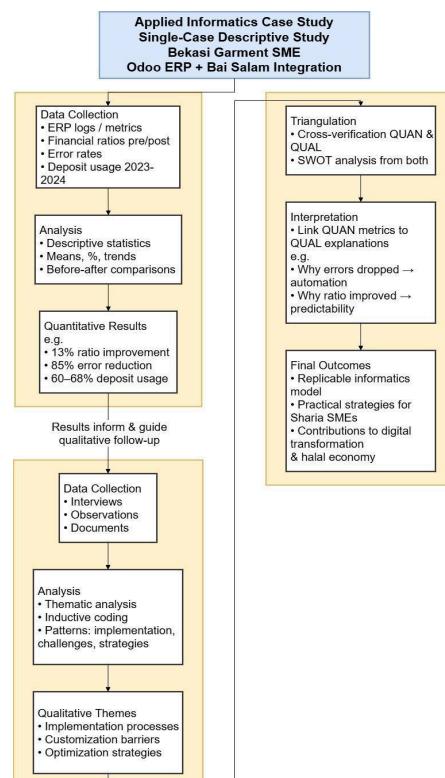


Figure 1. Research Methodology Flowchart: Sequential Explanatory Mixed-Methods Approach in an Applied Informatics Case Study

2.2. Data Analysis

Qualitative data were analyzed using thematic analysis with inductive coding to identify recurring patterns related to implementation processes, challenges, and optimization strategies, such as themes surrounding system customization and barriers stemming from digital literacy. Quantitative data underwent descriptive statistical analysis, including calculations of means, ratios, percentages, and trends, to measure tangible improvements, for instance, the shift in financial performance ratio from 1.15 to 1.28. Findings from both approaches were integrated through triangulation, with a SWOT analysis employed to derive strategic recommendations for informatics enhancements. Odoo's built-in reporting tools, supplemented by external software such as Python with the pandas library for advanced processing, facilitated data extraction and visualization. To ensure validity and reliability, multiple data sources were cross-verified, member checking was performed with participants, and strict ethical standards were maintained, including informed consent and participant anonymity [8].

2.3. System Customization and Workflow in Odoo ERP

As an applied informatics intervention, researchers customize Odoo (open-source, modular platform) to support Bai Salam transactions. Key modifications involved configuring payment methods to handle advance deposits, which are recorded as liabilities until product delivery, as well as automating ledger adjustments to maintain Sharia compliance in accordance with PSAK 103 [4]. Integration across sales, inventory, and accounting modules enabled real-time tracking, including e-wallet deposit reductions upon order fulfillment. The following Figure 2 diagram illustrates the customized workflow for Bai Salam transactions in Odoo ERP at the SME, showing integration from customer deposit to production, delivery, and accounting recognition.

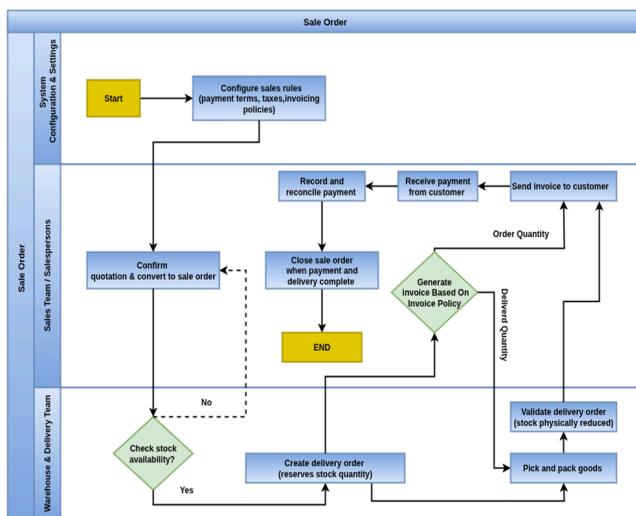


Figure 2. Odoo Sales Module Management Features Process WorkFlow in Odoo

Figure 3 shows standard Odoo sales order process flow, customized for deposit-based orders

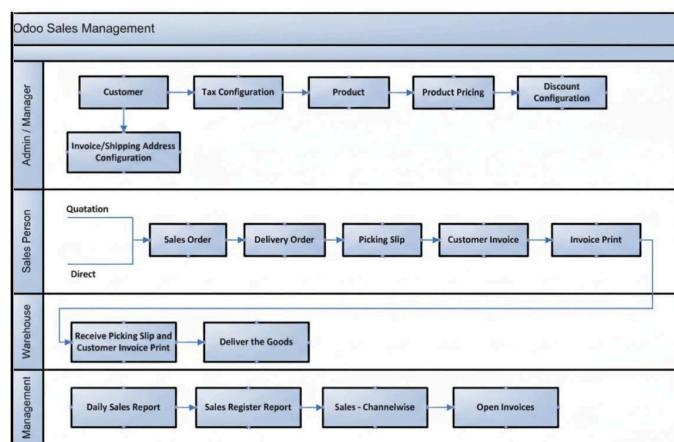


Figure 3. Odoo sales workflow integrating quotation to invoice

3. RESULTS AND DISCUSSION

This section presents the key findings from the case study at the SME, focusing on the applied informatics outcomes of integrating Bai Salam contracts into the Odoo ERP system. The results are derived from qualitative thematic analysis of interviews, observations, and documents, triangulated with quantitative data extracted from the ERP system. Overall, the implementation demonstrated significant improvements in transaction transparency, operational efficiency, and Sharia compliance, while revealing specific challenges and strategic insights.

3.1. Implementation of Bai Salam Integration in Odoo ERP

The customization of Odoo ERP enabled seamless handling of Bai Salam transactions through an e-wallet deposit system. Customers performed advance payments (top-ups) recorded as liabilities in the accounting module until product delivery, at which point the system automatically converted them to revenue. This automation integrated sales orders, inventory management, and financial reporting in real-time, reducing manual interventions and ensuring adherence to PSAK 103 on Salam accounting [4].

The workflow involved key informatics processes: customer deposit initiation via customized payment methods, automatic deduction upon sales order confirmation, real-time inventory updates for production planning, and Sharia-compliant ledger postings. Observations and interviews confirmed that this integration accelerated transaction processing and minimized discrepancies between recorded deposits and actual usage [1], [15].

The following Figures 4-6 illustrate aspects of the customized Odoo workflow for handling advance payments and sales processes, adapted for Bai Salam transactions.

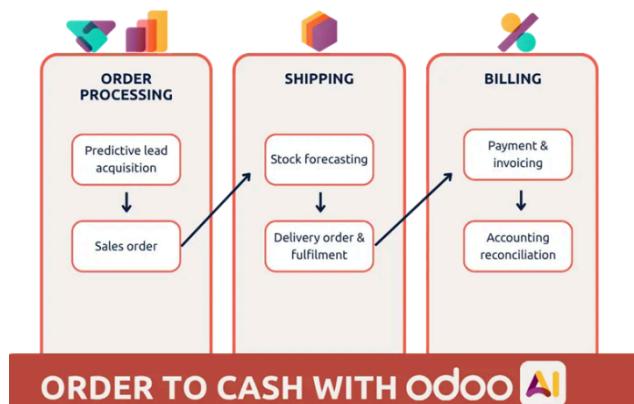


Figure 4. Odoo Order-to-Cash process with AI-enhanced prepayment handling, analogous to deposit automation

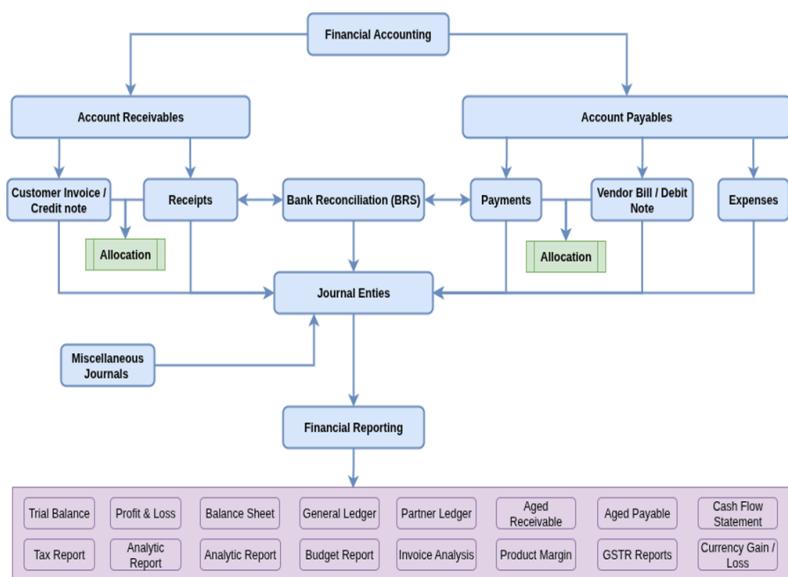


Figure 5. Odoo Accounting module flow for enterprise editions, showing integrated financial tracking.

Figure 6 shows how to create Projects and Tasks from Sales Orders.

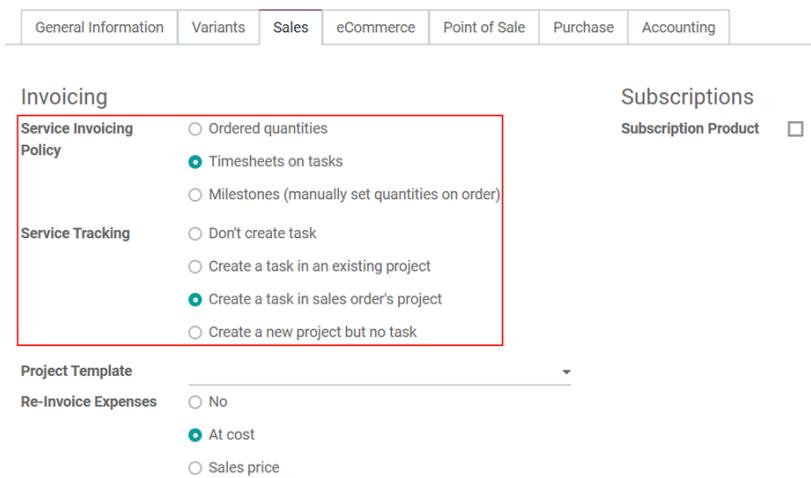


Figure 6. Standard Odoo sales invoicing workflow, adapted for deposit-based orders)

3.2. Performance Impacts and Quantitative Improvements

The post-implementation analysis of Odoo ERP data revealed notable changes in key operational and financial metrics. The financial performance ratio increased from 1.15 (pre-ERP implementation) to 1.28 (post-implementation), representing a 13% improvement. Transaction inaccuracies decreased significantly, with an 85% reduction in discrepancies compared to the previous manual system.

E-wallet deposit usage, serving as a proxy for Bai Salam transaction engagement, showed consistent monthly ratios ranging from 60% to 68% (Table 1). Peak usage occurred during seasonal periods, such as December (year-end) and April (Idul Fitri), aligning with higher demand for Muslim garment products [12].

Table 1. summarizes monthly e-wallet deposit trends (adapted from ERP ledger data, 2023-2024):

Month	Deposit Inflow (%)	Usage (%)	Ratio (%)	Notes
January	Baseline	62		Steady post-holiday
February	Low	60		Promotional incentives applied
March	Rising	65		Pre-Ramadan preparation
April	Peak	68		Idul Fitri surge
December	Peak	67		Year-end shopping

(Source: ERP transaction logs; illustrative of trends showing 60-68% consistent usage)

Descriptive statistics on e-wallet deposit usage (as a proxy for Bai Salam transaction engagement) showed high consistency and reliability (Table 2). Over a 12-month period, the mean usage ratio (percentage of deposited funds utilized in transactions) was 63.92%, with a standard deviation of 2.43%, indicating stable customer behavior. The minimum ratio was 60%, the median 64%, and the maximum 68% during peak seasons. These figures highlight fewer transaction errors and higher productivity, as automated tracking minimized discrepancies in deposit ledgers and enabled accurate forecasting.

Transaction error rates declined dramatically, with descriptive comparisons showing an 85% reduction in discrepancies (e.g., mismatches between recorded deposits and actual usage) compared to the manual system. This improvement stemmed from automated verifications and real-time ledger updates, fostering greater trust among customers and internal accuracy [16].

Table 2 Descriptive Statistics of E-Wallet Deposit Usage Ratio (12 Months Post-Implementation)

Statistic	Value (%)
Count	12
Mean	63.92
Standard Deviation	2.43
Minimum	60.00
25th Percentile	62.00
Median	64.00

Statistic	Value (%)
75th Percentile	65.25
Maximum	68.00

(Source: Derived from ERP transaction logs; peaks in April and December aligned with Idul Fitri and year-end demand)

These metrics were extracted using Odoo's built-in reporting tools and supplemented by Python (pandas library) for trend analysis. These descriptive results confirm that the informatics intervention not only quantified efficiency gains but also provided empirical evidence of reduced variability and enhanced predictability in Sharia-compliant operations.

3.3 Comparative Analysis and Interpretation

The observed improvements align with broader ERP adoption benefits in SMEs, where automation and real-time integration typically enhance accuracy and efficiency. For instance, studies on ERP implementations in small businesses report substantial reductions in transaction errors and data discrepancies through process standardization and reduced manual entry (e.g., error reductions of 50–70% in various manufacturing and service SMEs). However, the 85% reduction in transaction inaccuracies achieved in this case exceeds many reported figures. This higher outcome can be attributed to the targeted informatics customization for Bai Salam contracts—specifically, automatic recording of advance deposits as liabilities and real-time ledger adjustments per PSAK 103—which directly addressed common manual mismatches in prepaid Sharia transactions not typically covered in generic ERP studies.

The 13% improvement in financial performance ratios (from 1.15 to 1.28) reflects enhanced cash flow predictability and inventory optimization, consistent with ERP literature showing gains in liquidity and operational metrics post-implementation (often 10–20% in financial ratios for SMEs after 12 months). In this Sharia-compliant context, the gains stem from better working capital management via e-wallet visibility and automated revenue recognition upon delivery, minimizing delays and enabling proactive production planning during peak seasons (e.g., Idul Fitri surges). This supports theories of digital transformation in SMEs, where integrated systems reduce variability and foster data-driven decisions [6].

Compared to prior studies separating Bai Salam (ethical capital focus, manual risks) from ERP (general transparency gains), this integration yields stronger results due to the applied informatics lens—bridging Islamic finance principles with modular open-source tools like Odoo. The stable 60–68% deposit usage ratio indicates reliable customer engagement and system trust, further amplified by Sharia compliance transparency absent in non-Islamic ERP cases.

These findings highlight why tailored customization outperforms off-the-shelf ERP in resource-constrained, faith-based SMEs: automation eliminates human errors in deposit tracking, while real-time integration aligns with halal supply chain demands for certainty and fairness.

3.4. Challenges

Despite successes, thematic analysis highlighted informatics-related challenges. Technical issues included the need for extensive module customization to align default Odoo features (designed for conventional payments) with Bai Salam requirements, such as treating deposits as liabilities [11]. Human factors emerged prominently: low digital literacy among staff led to initial adaptation difficulties, requiring intensive training. Customers occasionally faced confusion with the e-wallet interface, though resolved through education. Regulatory challenges involved ensuring full Sharia compliance in automated postings [16].

3.4. SWOT Analysis

The SWOT analysis, weighted through triangulation of qualitative themes, quantitative impacts, and expert judgments (15 respondents), positioned the implementation favorably (Table 3).

Table 3 Weighted SWOT Factors

Factor	Elements	Total Score
Strengths	Automation, transparency, real-time tracking	15.0
Weaknesses	Customization needs, digital literacy gaps	13.4
Opportunities	Fintech integration, regulatory support	15.0
Threats	Technical risks, idle deposits	13.5

Internal Factor Evaluation (IFE): +1.6 External Factor Evaluation (EFE): +1.5 Strategic Position: Quadrant I (Growth Strategy)

Table 4 depict standard SWOT matrices for ERP implementations, representative of the findings. SWOT analysis of the implemented ERP system Opportunities Threats. Priority strategies included strengthening automation (score 4.5) and ensuring Sharia compliance (4.3), confirming the informatics intervention's positive net impact [3], [17].

These results underscore Odoo ERP's efficacy as an applied informatics tool for Sharia-based SMEs, yielding measurable efficiency gains while highlighting areas for refinement.

Table 4 Weighted SWOT Factors

Opportunities	Threats
<ul style="list-style-type: none">• Customer satisfaction• Central control on workflow data• New strategies for improvement• Division for consulting• Market of software providers	<ul style="list-style-type: none">• Security• Cost of maintenance• Slow development• Lack of consultants trained in the field of ERP• Lack of qualified employees to operate and service the system
Strengths	Weaknesses
<ul style="list-style-type: none">• Improvement of the customer service process• Re-engineering of the business processes• Optimization of the company's operating costs• Effective and experienced staff responsible for implementation• Development of long-term plans, missions, and visions• Improvement of decision-making efficiency• Establishment of coherent decision-making pattern• Modern IT infrastructure	<ul style="list-style-type: none">• Employees' reluctance to changes• Employees' fears of constant control• Employees' poor skills in operating new systems• Bureaucracy• Over-expenditure and over-schedule• Dependence on external consultants

4. DISCUSSION AND CONCLUSION

4.1 Discussions

The findings from this case study at the SME illustrate the transformative potential of applied informatics in bridging Islamic financial principles with modern digital tools. The successful customization of Odoo ERP to support Bai Salam transactions demonstrates how open-source platforms can be adapted for Sharia-compliant operations in SMEs. By automating deposit recording as liabilities and enabling real-time conversions upon delivery, the system enhanced transparency and reduced errors by 85%, aligning with principles of fairness and accountability in Islamic economics [17], [18]. This integration not only streamlined cash flow management but also improved inventory control and production planning, addressing common manual system pitfalls highlighted in prior literature [10], [19].

The quantitative improvements—a 13% rise in financial performance ratios from 1.15 to 1.28 and consistent 60-68% e-wallet usage—underscore the efficacy of informatics-driven automation in boosting operational efficiency [6]. These gains reflect better data integration and real-time analytics, enabling proactive decision-making during peak seasons like Idul Fitri. However, challenges such as technical customization needs and low digital literacy echo broader issues in SME ERP adoption [11]. The SWOT analysis positioned the implementation in a growth quadrant, emphasizing strengths like automation while recommending strategies to mitigate weaknesses through training and module enhancements.

Compared to existing studies, this research advances applied informatics by providing empirical evidence of Odoo's flexibility in Sharia contexts, where default features require significant adaptation for contracts like Bai Salam [16]. The workflow customizations highlight practical informatics solutions for halal supply chains. These results contribute to Indonesia's digital economy, supporting halal industry growth amid modest fashion demands.

4.2 Limitations

As a single-case study focused on one garment SME, generalizability is limited to similar Sharia-based contexts. The reliance on self-reported data and a relatively short post-implementation observation period may overlook long-term effects. Additionally, external factors like market volatility were not deeply controlled.

4.3 Conclusion

This study concludes that integrating Bai Salam contracts into Odoo ERP through applied informatics significantly enhances transparency, efficiency, and Sharia compliance in SMEs. At the SME, the customized system yielded measurable improvements in financial ratios, error reduction, and customer engagement via e-wallet deposits, positioning open-source ERP as a viable tool for digital transformation in Islamic finance. Despite challenges in customization and literacy, strategic interventions like training and regulatory alignment enabled positive outcomes. Ultimately, this framework offers a replicable model for Indonesian SMEs to leverage informatics for sustainable, ethical growth in the halal economy [19], [20].

For practitioners, SMEs should prioritize intensive training, ongoing module customization, and incentives (e.g., cashback) to boost e-wallet adoption. Integrating with Sharia fintech platforms could further enhance scalability.

For future research, longitudinal studies on AI-enhanced predictive analytics in Odoo for Bai Salam forecasting, or comparative analyses across sectors, are recommended. Policymakers should incentivize open-source ERP adoption through subsidies and Sharia-compliant digital guidelines to accelerate SME transformation

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