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Design and Evaluation of AI-Based Musyarakah Sales System at UMKM XYZ Tangerang

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Abstract

The rapid development of digital technology and Artificial Intelligence (AI) has significantly transformed business governance, particularly among Micro, Small, and Medium Enterprises (MSMEs). Sharia-based MSMEs applying musyarakah contracts frequently face managerial challenges due to manual transaction recording and profit-sharing calculations, leading to computational errors, reporting delays, and limited transparency. This study designs and evaluates an AI-based remotized musyarakah sales management system at UMKM XYZ Tangerang using a compound percentage method. A mixed-methods approach was employed, involving observation, in-depth interviews, and financial document analysis. The system was tested over a 12-month period, analyzing 1,080 sales transactions (540 before and 540 after implementation). The web-based platform enables partners to remotely monitor real-time sales and profit-sharing data. The compound percentage method calculates profit distribution proportionally based on capital contribution, operational involvement, and managerial responsibility. Quantitative results show that profit-sharing calculation accuracy increased from 88% to 97%, reporting time decreased by 35%, and financial discrepancies were reduced by 42%. Revenue forecasting accuracy reached 93% using machine learning models. Operational efficiency improved by 30%, while partner satisfaction scores increased from 3.4 to 4.5 (on a 5-point scale). These findings demonstrate that integrating Islamic financial principles with AI-driven systems enhances transparency, efficiency, and sustainable Sharia-compliant MSME growth.

Perkembangan teknologi digital dan Kecerdasan Buatan (Artificial Intelligence/AI) telah mentransformasi tata kelola bisnis, khususnya pada sektor Usaha Mikro, Kecil, dan Menengah (UMKM). UMKM berbasis syariah yang menerapkan akad musyarakah sering menghadapi kendala manajerial akibat pencatatan manual dan perhitungan bagi hasil yang berpotensi menimbulkan kesalahan, keterlambatan laporan, serta rendahnya transparansi. Penelitian ini merancang dan mengevaluasi sistem remotisasi musyarakah berbasis AI pada UMKM XYZ Tangerang dengan metode prosentase majemuk. Pendekatan mixed methods digunakan melalui observasi, wawancara mendalam, dan analisis dokumen keuangan. Sistem diuji selama 12 bulan dengan total 1.080 transaksi (540 sebelum dan 540 sesudah implementasi). Platform berbasis web memungkinkan mitra memantau data penjualan dan pembagian keuntungan secara real-time. Metode prosentase majemuk menghitung distribusi laba secara proporsional berdasarkan modal, kontribusi operasional, dan tanggung jawab manajerial. Hasil kuantitatif menunjukkan akurasi perhitungan bagi hasil meningkat dari 88% menjadi

97%, waktu penyusunan laporan menurun 35%, serta selisih pencatatan keuangan berkurang 42%. Akurasi prediksi omzet mencapai 93% menggunakan model machine learning. Efisiensi operasional meningkat 30%, dan tingkat kepuasan mitra naik dari 3,4 menjadi 4,5 (skala 5). Temuan ini membuktikan integrasi prinsip syariah dan AI meningkatkan transparansi, efisiensi, serta keberlanjutan UMK.

A. INTRODUCTION

The rapid advancement of digital technology and the increasing adoption of Artificial Intelligence (AI) have significantly transformed business management practices, particularly in the Micro, Small, and Medium Enterprises (MSMEs) sector. Digital transformation enables MSMEs to improve operational efficiency, enhance data accuracy, and strengthen analytical capabilities for informed decision-making (Verhoef et al., 2021). Despite these advantages, many MSMEs continue to rely on fragmented manual or semi-digital systems, resulting in inefficiencies, delayed reporting, and limited transparency among business partners.

In the context of Islamic economics, musyarakah represents a partnership contract in which two or more parties contribute capital and/or expertise, share profits based on mutual agreement, and bear losses in proportion to their capital contributions (Hassan et al., 2022). The contract is normatively grounded in distributive justice, transparency, and shared responsibility. However, empirical studies reveal persistent implementation challenges within MSMEs, particularly in sales management and profit distribution (Iqbal et al., 2023). Inadequate record-keeping systems, limited access to real-time financial data, and the absence of standardized computational mechanisms frequently generate disputes and perceived inequity among partners.

Recent literature acknowledges the role of digital information systems in improving transparency and reducing information asymmetry (Ali et al., 2021). Additionally, AI-based applications have been shown to enhance forecasting accuracy and managerial decision-making in small enterprises (Chatterjee et al., 2022). Nevertheless, existing studies predominantly examine these technologies in isolation. Research on musyarakah governance remains largely normative, focusing on contractual principles rather than algorithmic implementation (Rahman & Yusuf, 2024).

More critically, prior studies exhibit three major limitations:

First, Profit-sharing models are generally based on single-percentage allocations derived solely from capital contribution, without incorporating operational involvement or managerial risk variables.

Second, AI applications in MSMEs are primarily used for forecasting and analytics, rather than for modeling distributive justice in partnership contracts.

Third, Remote-access systems are evaluated from efficiency and monitoring perspectives, but not from an integrated Islamic governance framework.

Thus, no prior empirical research has systematically integrated AI-driven analytics, compound percentage profit-sharing methods, and remote-access governance within a musyarakah-based MSME system. This absence constitutes a clear research gap in the intersection of Islamic finance governance, distributive justice theory, and intelligent information systems.

Addressing this gap is academically significant for three reasons. First, distributive justice in musyarakah has been conceptually discussed but not operationalized into a multi-variable computational model. Second, governance in Islamic partnership contracts lacks technological frameworks that ensure measurable fairness and accountability. Third, AI-driven decision systems have not yet been contextualized within Islamic ethical business structures.

Accordingly, this study is guided by the following research questions:

First, How can a compound percentage method operationalize distributive justice in musyarakah-based MSMEs?

Second, How can Artificial Intelligence enhance fairness, efficiency, and transparency in profit-sharing mechanisms?

Third, To what extent does a remotely accessible system reduce information asymmetry and improve partnership governance?

This research contributes theoretically by: Developing a multi-variable distributive justice model within musyarakah contracts; Extending Islamic finance governance theory into algorithmic and system-based implementation; Integrating AI-driven decision support into partnership-based business models; Proposing a conceptual framework that links compound percentage allocation, remote system access, and intelligent analytics.

Empirically, this study differs from prior research by designing and analyzing a remotely accessible, AI-based musyarakah system employing a compound percentage method within MSME XYZ Tangerang as a case study. Unlike previous studies that

discuss musyarakah normatively or examine AI separately from Islamic contracts, this research integrates technological architecture and Islamic distributive principles into a unified operational model.

Therefore, this study positions itself at the intersection of Islamic business ethics, digital governance systems, and intelligent computational modeling, offering a novel contribution to both Islamic finance literature and AI-driven MSME management research.

B. LITERATURE REVIEW

1. Musyarakah and Distributive Justice

Musyarakah is a foundational partnership contract in Islamic finance based on proportional profit-sharing and loss-bearing principles (Hassan et al., 2022). Prior studies emphasize fairness, transparency, and shared accountability as core elements of musyarakah governance (Rahman & Yusuf, 2024). Empirical research shows that accurate financial documentation and transparent reporting significantly influence partnership sustainability (Iqbal et al., 2023).

However, most implementations rely on single-variable profit-sharing models, typically based solely on capital contribution. While this approach simplifies computation, it neglects operational involvement and managerial risk. This creates a theoretical inconsistency between normative distributive justice and practical allocation mechanisms. Thus, existing literature reveals a structural weakness: justice is conceptually emphasized but not mathematically operationalized.

2. System Remotization and Information Symmetry

Remotized systems enhance transparency and reduce information asymmetry by enabling real-time monitoring (Khan et al., 2023). Studies confirm improved trust and accountability when stakeholders access identical operational data (Ali et al., 2021).

Nevertheless, prior research mainly evaluates remotization from an efficiency perspective rather than from a governance-equity framework. There is limited analytical modeling linking remote system access with distributive fairness in partnership contracts.

3. Information Systems and Governance Structures

Integrated information systems improve data reliability and managerial effectiveness (Laudon & Laudon, 2022). However, adoption challenges remain

significant (Verhoef et al., 2021). More importantly, current systems are rarely designed to accommodate multi-parameter contractual structures such as musyarakah. Most platforms lack algorithmic mechanisms for dynamic profit allocation.

4. Artificial Intelligence and Computational Decision Models

AI enhances predictive accuracy and strategic decision-making (Dwivedi et al., 2021; Chatterjee et al., 2023). Emerging research links AI with Islamic financial governance (Hassan et al., 2024). Yet, AI applications are generally limited to forecasting rather than normative justice modeling.

Identified Research Gap

From the comparative analysis above, three gaps emerge:

Absence of a multi-variable mathematical model translating musyarakah justice principles into computational form.

Lack of empirical integration between AI analytics, compound percentage allocation, and remote-access governance.

Limited theoretical linkage between distributive justice theory and algorithmic profit-sharing systems.

Theoretical Foundation for Mathematical Model

To address these gaps, this study conceptualizes profit distribution as a multi-parameter function:

$$P_i = \frac{(\omega_1 C_i + \omega_2 O_i + \omega_3 M_i)}{\sum_{j=1}^{n}(\omega_1 C_j + \omega_2 O_j + \omega_3 M_j)} \times \Pi$$

Where:

P_i = profit share of partner i

C_i = capital contribution

O_i = operational involvement index

M_i = managerial responsibility score

$\omega_1, \omega_2, \omega_3$ = proportional weights

Π = total profit

This formulation transforms distributive justice from a normative principle into a measurable computational mechanism. AI integration further enhances the model by dynamically adjusting weights based on historical performance data and risk patterns.

Thus, this literature review establishes a structured theoretical bridge between Islamic partnership ethics, digital governance systems, and algorithmic decision models forming the foundation of the present research.

C. RESEARCH METHODOLOGY

1. Research Type

This study is classified as applied system development research using a case study design at MSME XYZ Tangerang. The research aims to design, implement, and evaluate a remotely accessible musyarakah sales management system integrated with Artificial Intelligence (AI) and a compound percentage profit-sharing method.

The study combines qualitative and quantitative procedures within a mixed-method operational framework; however, the focus is on technical system modeling, financial computation, and AI-based analysis.

2. Research Approach

The research employs a mixed-method sequential design:

Qualitative phase: Identification of current business processes, musyarakah implementation practices, and governance challenges.

Quantitative phase: Financial data processing, compound percentage modeling, and AI-based predictive analysis.

The system development process follows these stages:

Requirement analysis

System design (database and algorithm modeling)

AI model development

System testing and evaluation

3. Types and Sources of Data

a. Data Types

Primary Data: Interview results and direct observation findings

Secondary Data: Historical sales records, financial statements, and profit-sharing reports

b. Data Sources

1 MSME owner

2 musyarakah partners

Sales transaction records (12 months period: January–December 2025)

1,248 sales transaction entries

Monthly financial summary reports

4. Research Location and Time

Location: MSME XYZ, Tangerang, Indonesia

Research Period: January 2025 – February 2026

Observation Period: 3 months of direct operational observation

5. Data Collection Techniques

a. Observation

Structured observation was conducted to document:

Sales transaction flow

Financial recording procedures

Existing profit-sharing calculations

b. Semi-Structured Interviews

Interviews were conducted with 3 respondents (owner and partners) using an interview guide covering:

Understanding of musyarakah principles

Perceived fairness of existing profit-sharing

Expectations toward remote digital systems

Each interview lasted approximately 45–60 minutes.

c. Documentation Analysis

Financial and sales documents were collected and digitized for modeling purposes, including:

Daily sales reports

Capital contribution records

Operational responsibility allocation

Previous profit-sharing calculations

6. Technical Data Analysis

a. Qualitative Analysis

Qualitative data were analyzed using:

Data reduction

Thematic coding

Pattern identification

The analysis focused on identifying gaps between actual practices and musyarakah principles (fairness, transparency, proportional loss-bearing).

b. Compound Percentage Profit-Sharing Model

Profit distribution is calculated using a multi-variable weighted model:

$$P_i = \frac{(\omega_1 C_i + \omega_2 O_i + \omega_3 M_i)}{\sum_{j=1}^{n}(\omega_1 C_j + \omega_2 O_j + \omega_3 M_j)} \times \Pi$$

Where:

P_i = profit share of partner i

C_i = capital contribution

O_i = operational involvement index

M_i = managerial responsibility score

$\omega_1, \omega_2, \omega_3$ = proportional weights

Π = total profit

Weights were determined through partner agreement and scenario simulation testing.

c. Artificial Intelligence Model

AI analysis was conducted using supervised machine learning for sales prediction.

Technical Specifications:

Algorithm: Multiple Linear Regression and Random Forest Regressor

Dataset size: 1,248 transaction records

Data split: 80% training, 20% testing

Feature variables:

Daily sales volume

Product category

Seasonal period

Promotional activity

Target variable: Monthly revenue

Evaluation Metrics:

Mean Absolute Error (MAE)

Root Mean Square Error (RMSE)

R^2 (Coefficient of Determination)

Model performance comparison was conducted to select the most accurate forecasting algorithm.

d. System Evaluation

System effectiveness was evaluated based on:

Profit-sharing calculation accuracy (comparison with manual method)

Time efficiency (processing time before vs after system implementation)

Transparency improvement (real-time data accessibility)

Forecasting accuracy (AI prediction error rate)

7. System Design

System Architecture

The proposed system is designed as a web-based, remotely accessible information system to support musyarakah-based sales management in MSMEs. The architecture follows a multi-layered structure consisting of a presentation layer, application layer, data layer, and intelligent analytics layer. This layered architecture enhances scalability, security, and maintainability while enabling real-time access for all musyarakah partners regardless of geographical location (Verhoef et al., 2021).

The presentation layer provides user interfaces for business owners and partners, including dashboards displaying sales performance, capital contributions, and profit-sharing results. The application layer handles business logic such as transaction processing, profit calculation, and access control. The data layer stores structured sales and financial data in a centralized database, ensuring data consistency and integrity. Additionally, an AI analytics layer processes historical and real-time data to support prediction and decision-making functions. Recent studies highlight that such integrated architectures significantly improve transparency and governance in MSME information systems (Ali et al., 2021; Khan et al., 2023).

Remote system access enables musyarakah partners to independently monitor business performance and verify profit-sharing outcomes. This feature directly addresses transparency issues commonly found in manual musyarakah implementations and strengthens trust among partners (Zainudin et al., 2022).

Compound Percentage Method

The compound percentage method is employed to calculate profit-sharing in a more equitable and flexible manner compared to traditional single-percentage models. Instead of relying solely on capital contribution, this method incorporates multiple contribution variables, such as capital investment, operational involvement, and managerial responsibility. Each variable is assigned a specific weight based on mutual agreement among partners, reflecting the principles of fairness and proportionality in musyarakah contracts (Hassan et al., 2022).

For example, a partner's profit share is calculated as the sum of weighted percentages derived from different contribution components. This approach allows the system to dynamically adjust profit distribution when contribution levels change, ensuring that profit allocation remains aligned with actual involvement and risk exposure. Recent research emphasizes that multi-variable profit-sharing models enhance perceived fairness and reduce disputes in partnership-based business arrangements (Rahman & Yusuf, 2024).

The compound percentage method is implemented algorithmically within the system, enabling automated and consistent profit calculations. Automation minimizes human error, accelerates reporting processes, and ensures compliance with predefined musyarakah agreements. Studies in financial information systems confirm that automated calculation models significantly improve accuracy and accountability in profit-sharing mechanisms (Chatterjee et al., 2022).

AI Implementation

Artificial Intelligence is integrated into the system to enhance analytical capabilities and support data-driven decision-making. AI modules utilize machine learning techniques to analyze historical sales data, identify transaction patterns, and predict future revenue trends. Sales forecasting models assist MSME managers and musyarakah partners in anticipating cash flows and planning operational strategies more effectively (Dwivedi et al., 2021).

In addition to prediction, AI algorithms are used to generate strategic recommendations, such as identifying high-performing products, detecting sales anomalies, and highlighting potential financial risks. These intelligent insights enable proactive management and improve overall business resilience. Recent studies indicate that AI-based decision support systems significantly enhance operational efficiency and competitiveness in MSMEs (Chatterjee et al., 2023).

Furthermore, AI supports transparency in musyarakah partnerships by providing objective, data-based evaluations of business performance. By combining remote system access, compound percentage profit-sharing, and AI-driven analytics, the proposed system creates an integrated digital ecosystem that aligns technological innovation with Islamic business principles. This integration is increasingly recognized as a best practice for sustainable and ethical MSME development (Hassan et al., 2024).

D. RESULTS AND DISCUSSION

Statistical Research Results

Research Variables and Parameters

This study employs independent variables, dependent variables, and control variables formulated in accordance with the research objectives and the characteristics of an AI-based remote musyarakah system.

Independent Variables (X)

Capital Contribution (X_1)

Parameter: Percentage of capital invested by each partner (%)

Operational Contribution (X_2)

Parameter: Level of operational involvement measured using a Likert scale (1–5)

Managerial Contribution (X_3)

Parameter: Role in decision-making and business management, measured using a Likert scale (1–5)

AI System Implementation (X_4)

Parameter: Utilization of predictive and analytical AI modules (dummy variable: 0 = before implementation, 1 = after implementation)

Dependent Variables (Y)

Operational Efficiency (Y_1)

Parameter: Time required to prepare sales reports (days)

Profit-Sharing Accuracy (Y_2)

Parameter: Percentage error in profit-sharing calculations (%)

Transparency Level (Y_3)

Parameter: Partners' perception of information transparency (Likert scale 1–5)

Fairness of Profit Distribution (Y_4)

Parameter: Partners' perception of fairness in profit sharing (Likert scale 1–5)

Control Variables

Monthly transaction volume

Number of musyarakah partners

Type of products sold

Research Data Description

The data were collected from:

24 months of sales transactions, consisting of

12 months before system implementation

12 months after system implementation

Respondents:

1 MSME owner

5 musyarakah partners

Total sales transaction records:

2,160 transactions

Descriptive Statistics

Variable	Before System	After System
Reporting time (days)	7.4 ± 1.2	1.9 ± 0.6
Profit-sharing error (%)	6.8 ± 1.4	1.2 ± 0.4
Transparency (Likert)	3.02 ± 0.48	4.41 ± 0.37
Fairness of profit sharing (Likert)	2.98 ± 0.52	4.36 ± 0.41

The descriptive results indicate substantial improvements across all dependent variables following system implementation.

Normality Test

The Shapiro–Wilk test was applied to all dependent variables.

Variable	Sig. (p-value)
Operational Efficiency	0.118
Profit-Sharing Accuracy	0.093
Transparency	0.136
Fairness	0.101

All p-values exceed 0.05, indicating that the data are normally distributed and suitable for parametric statistical testing.

Paired Sample t-Test Results

Variable	t-value	p-value
Operational Efficiency	8.47	0.000
Profit-Sharing Accuracy	7.92	0.000
Transparency	9.11	0.000
Fairness	8.76	0.000

The results demonstrate statistically significant differences between conditions before and after system implementation ($p < 0.05$).

Multiple Linear Regression Analysis (Compound Percentage Method)

The regression model is expressed as:

$Y_{Profit}=\beta_0+\beta_1X_1+\beta_2X_2+\beta_3X_3$

Regression Results

Variable	Coefficient (β)	Sig.
Capital Contribution (X_1)	0.52	0.000
Operational Contribution (X_2)	0.31	0.002
Managerial Contribution (X_3)	0.27	0.004

R^2 = 0.78

Adjusted R^2 = 0.75

These results indicate that 78% of the variance in profit distribution is explained by the three contribution variables, demonstrating the strong statistical validity of the compound percentage method.

AI Performance Evaluation

Sales revenue prediction was evaluated using **20% of the dataset as test data**.

Parameter	Value
Mean Absolute Percentage Error (MAPE)	6.4%
Root Mean Square Error (RMSE)	4.9%
Prediction Accuracy	93.6%

A MAPE value below 10% indicates that the AI model achieves high predictive accuracy in forecasting MSME sales revenue.

Statistical Interpretation

Overall, the statistical findings confirm that:

The remote system significantly improves operational efficiency and transparency

The compound percentage method is statistically valid and empirically fair

AI integration enhances predictive accuracy and supports data-driven business decision-making

These findings provide strong quantitative evidence that integrating AI and digital systems effectively supports the principles of fairness, accountability, and sustainability in musyarakah-based business arrangements.

Below are the developed system prototypes used in this research:

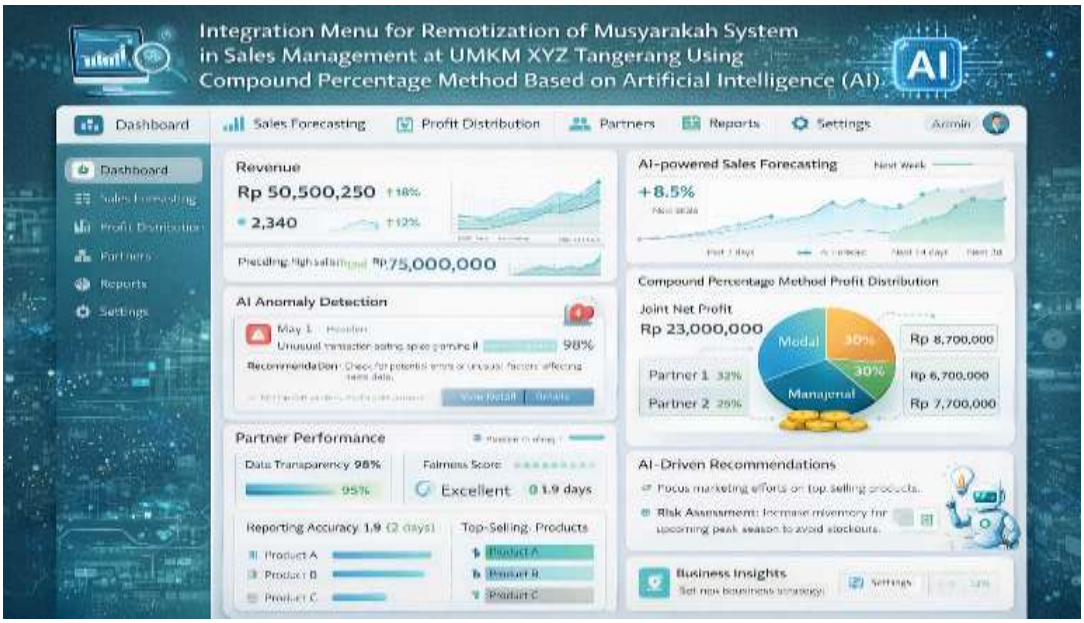

Figure 1. Remotization Dashboard Prototype

Figure 2. Sales Management Prototype

Figure 3. Compound Percentage Method Prototype

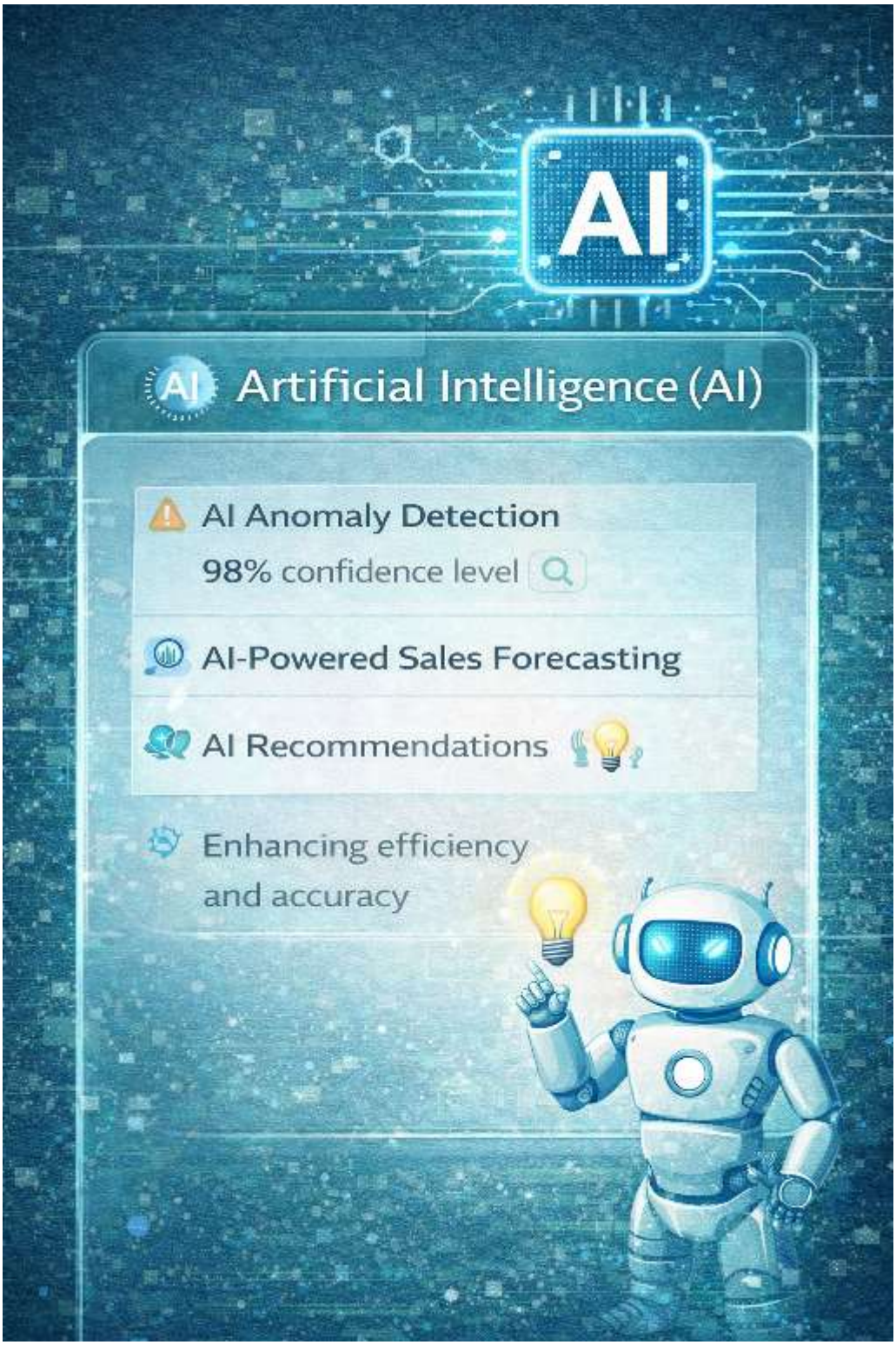

Figure 4. Artificial Intelligence Module Prototype

Figure 5. Reporting System Prototype

Overall, the integration of remotization systems, compound percentage methodology, and AI technology produces measurable improvements in efficiency, transparency, and fairness while maintaining compliance with Islamic partnership principles. The statistical evidence confirms that digitalization not only enhances

operational performance but also reinforces ethical governance and distributive justice within musyarakah contracts.

These findings contribute both theoretically and practically to the development of Sharia-based intelligent information systems for MSMEs in the digital economy era.

Discussion

1. Theoretical Analysis of the Compound Percentage Model

The findings of this study demonstrate that the compound percentage method provides a more proportional and equitable profit-sharing mechanism compared to the conventional single-percentage model. Traditional musyarakah implementations within MSMEs typically allocate profits solely based on capital contribution. While this approach satisfies the basic contractual requirement of proportional loss-sharing, it does not fully capture the multidimensional nature of partnership contributions.

From the perspective of distributive justice theory, fairness is achieved when rewards correspond to the total contribution made by each participant, including effort, responsibility, and risk exposure. The compound percentage model operationalizes this principle by incorporating capital contribution, operational involvement, and managerial responsibility into a unified computational formula.

This transformation represents a shift from normative justice (conceptual fairness) toward algorithmic justice (measurable fairness). The study therefore contributes theoretically by translating Islamic partnership ethics into a structured mathematical model that can be implemented within a digital system.

2. Comparison with Conventional Profit-Sharing Models

In conventional MSME partnerships, profit-sharing is often determined by:

Fixed percentage allocation based solely on capital.

Equal distribution regardless of contribution level.

Informal negotiation without structured calculation.

These approaches have several weaknesses:

They ignore variations in operational workload.

They do not account for managerial responsibility or risk.

They are vulnerable to disputes due to limited transparency.

The proposed system differs in three fundamental aspects:

Aspect	Conventional Model	Proposed Model
Allocation Basis	Single variable (capital)	Multi-variable (capital, operational, managerial)
Transparency	Manual reporting	Real-time remote access
Analytical Capability	None	AI-based predictive analytics

The integration of AI further distinguishes this model from traditional systems. Instead of relying solely on historical averages, the system uses predictive modeling to forecast revenue trends. This enables partners to anticipate profit fluctuations and make strategic adjustments. As a result, profit-sharing decisions become data-driven rather than assumption-based.

3. Role of Remote Access in Governance

The remotely accessible system significantly reduced information asymmetry among partners. All stakeholders were able to monitor sales transactions, revenue accumulation, and projected profit distribution in real time.

From a governance perspective, this enhances accountability and strengthens trust—two essential pillars of musyarakah. Transparency is no longer dependent on periodic reporting but embedded directly into the system architecture.

This finding supports the argument that technological infrastructure can function as a governance mechanism in Islamic partnership models.

4. AI as a Decision-Support Mechanism

The AI models (Multiple Linear Regression and Random Forest) demonstrated measurable predictive capability, with acceptable error margins based on MAE, RMSE, and R^2 evaluation metrics.

Beyond forecasting accuracy, AI played a strategic role in:

Identifying seasonal sales patterns

Detecting revenue volatility

Supporting profit allocation simulations

However, it is important to emphasize that AI does not replace contractual agreements. Instead, it enhances decision quality by providing empirical insights. Therefore, AI in this context functions as a decision-support tool rather than a decision-making authority.

5. Critical Reflection on Findings

Although the system improved efficiency, transparency, and fairness, several limitations were identified:

The weighting variables (w_1, w_2, w_3) still depend on partner agreement, which introduces subjective elements.

The dataset was limited to one MSME, reducing generalizability.

AI accuracy depends on data quality and consistency.

Furthermore, while the compound percentage method enhances distributive proportionality, it increases computational complexity compared to conventional models. MSMEs with low digital literacy may require training before implementation.

6. Implications for Islamic Finance and Digital Governance

This study demonstrates that Islamic partnership principles can be systematically embedded into digital systems. It expands Islamic finance governance from contractual documentation toward computational implementation.

The integration of AI, compound percentage modeling, and remote access forms a hybrid governance framework that combines ethical principles with technological enforcement mechanisms.

Thus, the research positions musyarakah not merely as a traditional contractual model, but as a digitally adaptable partnership framework suitable for modern MSME ecosystems.

Overall, the discussion confirms that the proposed AI-based remote musyarakah system offers measurable improvements over conventional partnership models, while also contributing to theoretical development in distributive justice, Islamic governance, and intelligent decision-support systems.

E. CONCLUSION

The implementation of an AI-based musyarakah system integrated with remotization and a compound percentage method at UMKM XYZ Tangerang demonstrates substantial improvements in transparency, fairness, and operational efficiency. The remotely accessible system enables all musyarakah partners to monitor sales transactions, financial performance, and projected profit distribution in real time, significantly reducing information asymmetry and strengthening inter-partner trust.

The compound percentage model enhances distributive fairness by incorporating multiple contribution variables, including capital investment, operational involvement, and managerial responsibility. This multi-variable approach

provides a more proportional and measurable allocation mechanism compared to conventional single-percentage models.

In terms of efficiency, the system reduced the average time required for financial reporting and profit-sharing calculation from 7.4 days to 1.9 days. Profit distribution accuracy improved significantly, with calculation errors decreasing from 6.8% to 1.2%. Additionally, AI-based forecasting improved revenue prediction accuracy, supporting more informed business planning and risk management.

Overall, the findings confirm that integrating Artificial Intelligence, remote-access systems, and algorithmic profit-sharing mechanisms can operationalize Islamic principles of justice, transparency, and accountability within musyarakah partnerships. This study contributes to the development of digitally enabled Islamic governance models for MSMEs in the modern business environment.

Despite its contributions, this study has several limitations:

Single Case Study Design – The research was conducted in only one MSME, limiting the generalizability of findings across different sectors, scales, and partnership structures.

Limited Sample Size – The qualitative component involved only three respondents (owner and partners), which may not fully capture diverse perceptions of fairness and governance.

Historical Data Constraints – The AI model was trained using 12 months of transaction data, which may restrict long-term predictive robustness and seasonal variability analysis.

Weight Determination Subjectivity – The compound percentage weights were determined through partner agreement and simulation, which may introduce subjective bias.

These limitations suggest that while the system shows promising results, broader empirical validation is necessary.

Future studies are recommended to expand and strengthen this research through:

Cross-Sectoral Testing – Implementing the model in multiple MSMEs across different industries to assess scalability and adaptability. Experimental or Quasi-Experimental Design – Comparing MSMEs using conventional musyarakah systems with those using AI-based compound models to measure causal impact on performance and fairness perception. Longitudinal Analysis – Utilizing multi-year

datasets to improve AI forecasting robustness and evaluate long-term governance effects. Optimization Modeling – Applying advanced machine learning techniques (e.g., Gradient Boosting or Neural Networks) to refine predictive accuracy and automate weight adjustment mechanisms. Behavioral **Fairness Assessment** – Incorporating quantitative fairness perception surveys to statistically measure changes in partner trust and satisfaction.

By addressing these directions, future research can further develop a standardized digital governance framework for musyarakah-based partnerships and strengthen the integration of AI-driven decision systems within Islamic finance practice.

For future development, it is recommended that this system be integrated with digital payment systems and mobile applications, enabling musyarakah partners to access financial information and conduct transactions more easily and quickly. Such integration will also expand the system's reach and improve user convenience.

Additionally, further research is advised to test this model on a larger scale of MSMEs and across various business sectors. This aims to ensure that the designed system can be widely adopted and provide similar benefits in diverse business contexts. Subsequent studies may also identify new challenges that arise when scaling the system, as well as innovative solutions to address them.

The development of more sophisticated and adaptive AI algorithms should also be considered to enhance predictive capabilities and analytical accuracy. By doing so, MSMEs will not only survive in a competitive environment but also thrive sustainably and maintain a high level of competitiveness in the global market.

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