

Determinants of Investment Decision Quality in Village-Owned Enterprises: The Role of Digital Literacy, Behavioral Factors, and Social Environment

Hendrik Suhendri¹, Agnes Quartina Pudjiastuti²

^{1,2}Tribhuwana Tungadewi University, Indonesia

h3ndr1k5g5@gmail.com *✉

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ABSTRACT

Keywords:
digital literacy;
decision-making
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environment;
investment decision
quality; BUMDes;

Background: This study examines the role of digital literacy knowledge, decision-making behavior, and social environment in shaping the quality of investment decisions within Village-Owned Enterprises (BUMDes) in Malang Raya. Guided by bounded rationality theory, the research argues that limitations in information processing, cognitive capacity, and social pressures influence how BUMDes managers evaluate and select investment alternatives.

Method: Using a quantitative descriptive–correlational design, data were collected through a survey of 66 BUMDes managers who met the criteria of active involvement in investment decision-making. The structural model was tested using PLS-SEM (WarpPLS).

Results: Results of the measurement model confirm that all constructs meet the reliability and validity criteria. The structural findings show that digital literacy knowledge does not significantly influence decision-making behavior, yet it has a significant effect on the social environment. Both decision-making behavior and social environment demonstrate significant positive effects on the quality of BUMDes investment decisions.

Conclusion: These results highlight that beyond individual cognitive capability, social norms and community expectations shape managerial investment judgment. The study contributes to the limited empirical literature on investment decision quality in BUMDes and underscores the need for strengthening digital competence and supportive social structures to enhance investment governance at the village level.

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INTRODUCTION

Village-Owned Enterprises (BUMDes) represent a cornerstone of Indonesia's rural economic development strategy under Law No. 6 of 2014. As community-owned productive institutions, they are mandated to drive local economic empowerment, provide public services, and make strategic investments that benefit village communities (Bebbington et al., 2006; Kusmulyono et al., 2023). In the

context of Indonesia's predominantly Muslim rural population, BUMDes are not merely economic actors; they are social institutions embedded in Islamic values of amanah (trustworthiness), masalahah (public welfare), and collective stewardship (khilafah). This dual identity as both formal economic entities and informal Islamic governance structures makes BUMDes a uniquely appropriate subject for Sharia economics scholarship.

This study is positioned within the thematic scope of the Sharia Economic and Management Business Journal (SEMBJ) for three substantive reasons. First, the empirical dominance of the social environment in determining investment decision quality ($\beta = 0.881$) reflects the primacy of Islamic collective governance mechanisms musyawarah, ijma, and ukhuwah Islamiyah (Islamic brotherhood) over individual managerial rationality, a finding with profound implications for Sharia governance theory. Second, the irrelevance of individual decision-making behavior to investment quality invites reinterpretation through the Islamic principle that organizational virtue (akhlaq) is cultivated through communal accountability rather than individual analytical excellence. Third, the Tawhidic governance framework grounded in the principle of divine unity (tawhid) that integrates ethical, social, and economic dimensions of decision-making—provides a theoretically coherent Islamic economics lens through which these empirical patterns can be explained and extended (Naqvi, 2016; Chapra, 2022).

Digital literacy has been identified as a potentially significant driver of organizational decision quality in the digital transformation era. The Islamic concept of 'ilm (knowledge) and its application through amanah mandates that BUMDes managers utilize available digital tools responsibly and transparently in the service of community welfare. However, the structural constraints of Islamic collective governance particularly the subordination of individual digital analytical outputs to communal deliberation processes may attenuate the direct behavioral impact of digital literacy, redirecting its influence toward social coordination and community information quality.

The theoretical framework of this study integrates bounded rationality (Simon, in Etzioni, 2010) with a Tawhidic epistemology that recognizes divine unity as the foundational organizing principle of all human knowledge and action (Naqvi, 2016). Under this framework, bounded rationality is not merely a cognitive constraint but an ontological condition that necessitates collective wisdom (shura) as the appropriate corrective mechanism for Islamic governance. This integration yields three research questions: (1) How do digital literacy, decision-making behavior, and social environment interact to determine BUMDes investment decision quality? (2) How does a Tawhidic governance framework explain patterns of insignificance and dominance in the structural model? (3) What are the implications for halal investment governance and Islamic participatory decision-making systems in Indonesian village enterprises?

The study makes four contributions: (1) it extends Tawhidic governance theory to village enterprise investment contexts; (2) it provides empirical evidence of Islamic collective governance mechanisms operating informally within conventional BUMDes structures; (3) it offers a theoretically grounded explanation for the paradox of high social environment dominance combined with insignificant individual-level effects; and (4) it advances practical recommendations for halal investment governance and Islamic financial literacy programs.

Literature Review and Hypothesis Formulation

Digital literacy refers to the ability to effectively and responsibly search for, evaluate, comprehend, and utilize digital information and technologies (Choudrie et al., 2018). Within the context of small and medium-sized organizations, including Village-Owned Enterprises (BUMDes), digital literacy enables managers to access diverse data sources, leverage digital financial platforms (FinTech), and apply basic analytical tools to assess investment opportunities (Zahoor et al., 2023); (Orrensalo et al., 2024). Empirical studies in the SME and micro-organization sectors indicate that digital literacy is associated with improvements in operational efficiency, the quality of information used in decision-making, and the capacity to mitigate risks related to digital fraud (Ayaz et al., 2025). Nevertheless, digital literacy extends beyond the mere availability of devices or network access; cognitive components—such as the ability to evaluate source credibility and interpret data—along with motivational aspects, play a crucial role in determining the extent to which digital literacy influences organizational strategic decisions (Choudrie et al., 2018).

Decision-making behavior encompasses the styles, risk preferences, heuristics, and cognitive processes employed by decision-makers when selecting among alternative courses of action (Etzioni, 2010). The management and organizational behavior literature documents varying effects of entrepreneurial orientation, risk-taking propensity, and analytical capability on the quality of investment decisions (Benayad & Aasri, 2023)(Wulandari & Wardani, 2024a). In the context of Village-Owned Enterprises (BUMDes), decision-making behavior is often shaped by local experience, deliberative traditions, and social accountability, which may lead to more conservative or excessively cautious investment choices (Fitriani et al., 2024). Empirical evidence from small and medium-sized enterprises further suggests that more structured decision-making practices—such as the use of cost-benefit analysis and cash flow projections—tend to produce higher-quality investment decisions compared to approaches relying solely on intuition (Garcia-Vidal et al., 2024).

The social environment encompasses norms, social networks, social capital, community pressures, and the expectations of local stakeholders surrounding an organization (Dudley, 2021). For Village-Owned Enterprises (BUMDes), which operate within close-knit community settings, social dimensions are particularly salient: traditions of mutual cooperation, the influence of community leaders, and informal interpersonal relationships shape investment priorities and confer legitimacy on projects (Revida et al., 2023). Research on social enterprises indicates that strong social capital—manifested through trust, networks, and relational ties—facilitates access to resources and supports the adoption of social innovations, thereby enhancing the quality of investment decisions when such capital is well developed (Daskalopoulou et al., 2023). Conversely, intense social pressure may foster conformity and shift decision-making away from economic rationality toward socio-political considerations (Wang et al., 2023).

The quality of investment decisions is assessed by the extent to which decisions are made through rigorous analytical processes, incorporate considerations of risk and return, align with organizational objectives, and generate favorable long-term outcomes such as returns, sustainability, and efficiency. Corporate finance literature typically emphasizes the use of investment appraisal techniques—such as net present value (NPV), internal rate of return (IRR), and payback period—as key indicators of decision quality. However, in community-based organizations like Village-Owned Enterprises (BUMDes), the concept of investment decision quality needs to be broadened to include the alignment of investments with village needs, effective risk control, and community acceptance (Kusmulyono et al., 2023). Prior studies on small and medium-sized enterprises and social enterprises further affirm that decision quality is not solely the outcome of analytical tools, but also reflects the integration of social values, managerial capacity, and the quality of information employed in the decision-making process (Garcia-Vidal et al., 2024)(Daskalopoulou et al., 2023).

Bounded rationality by Simon (Etzioni, 2010) serves as the primary theoretical framework of this study. The theory posits that while decision-makers intend to act rationally, their choices are constrained by cognitive limitations, information availability, and time pressures. In the context of Village-Owned Enterprises (BUMDes), these constraints manifest in limited financial data, insufficient analytical capacity among managers, and social pressures, which collectively lead to satisficing behavior—where decision-makers select options that are “good enough” rather than pursuing absolute optimization. This framework helps explain why improvements in digital literacy do not necessarily translate directly into higher-quality decision-making when social dimensions and managerial capabilities remain inadequate (Etzioni, 2010)(Fitriani et al., 2024).

Several studies report a positive association between digital and financial literacy and decision quality or financial well-being (Choudrie et al., 2018) (Fadhilah, 2024). Research on Village-Owned Enterprises (BUMDes) by (Fitriani et al., 2024) and (Wulandari & Wardani, 2024b) underscores the importance of managerial capabilities and information technology readiness; however, empirical evidence examining the simultaneous relationships among digital literacy, decision-making behavior, the social environment, and investment decision quality within the specific context of BUMDes remains scarce. Moreover, preliminary findings from selected cases suggest inconsistent results—for instance, digital literacy may influence the social environment without necessarily exerting a direct effect on decision-making behavior—indicating the need for path modeling and mediation analysis in the BUMDes context (Garcia-Vidal et al., 2024) and (Fitriani et al., 2024).

Based on the preceding theoretical review and empirical evidence, this study develops a conceptual framework in which Digital Literacy Knowledge (X1) influences Decision-Making Behavior (X2) and the Social Environment (X3). Subsequently, X2 and X3 are posited to affect the Investment Decision Quality of Village-Owned Enterprises (BUMDes) (Y). In addition, this study assumes that X1 exerts an indirect effect on Y through the mediating pathways of X2 and X3.

Conceptual Framework

Investors and decision-makers do not operate in a fully rational manner; rather, their choices are shaped by social perceptions, group opinions, and social pressures. Social conformity bias leads decision-makers to align their actions with prevailing norms or group decisions instead of relying solely on individual rational analysis. In environments characterized by limited access to information, social influence tends to become a dominant determinant of investment decisions (Wang & Rieger, 2019). Within the context of BUMDes investment management, the social environment plays a critical role in shaping managers' perspectives and decision-making behaviors. As noted by Wang and Rieger (2019), social influence can alter investment preferences and prompt individuals to adjust their choices in accordance with group norms or social opinions, often deviating from pure economic rationality.

This model enables the examination of both direct and indirect (mediated) effects and is well suited to a PLS-SEM approach for analyzing medium-sized samples, such as those typically employed in studies of Village-Owned Enterprises.

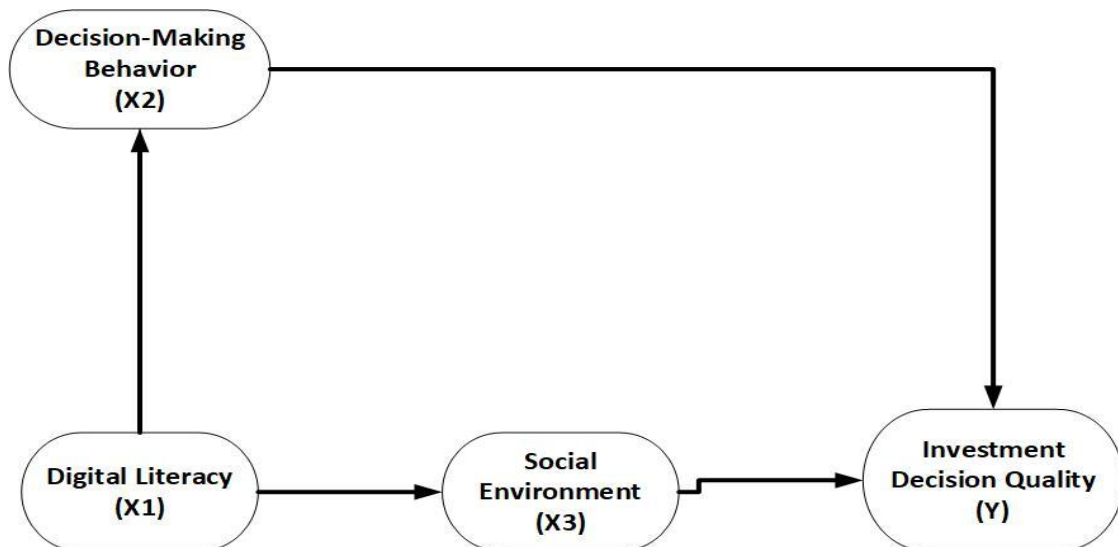


Figure 1. Conceptual Framework

Accordingly, the hypotheses tested in this study are formulated as follows:

- H1: Digital literacy knowledge (X1) has a significant effect on decision-making behavior (X2).
- H2: Digital literacy knowledge (X1) has a significant effect on the social environment (X3).
- H3: Decision-making behavior (X2) has a significant effect on the investment decision quality of Village-Owned Enterprises (BUMDes) (Y).
- H4: The social environment (X3) has a significant effect on the investment decision quality of Village-Owned Enterprises (BUMDes) (Y).

METHOD

Research Design and Philosophical Positioning

This study employs a quantitative descriptive–correlational cross-sectional design analyzed through PLS-SEM (WarpPLS 7.0). The philosophical positioning aligns with a post-positivist ontology that recognizes objective social patterns while acknowledging the interpretive influence of Islamic cultural values on organizational behavior. PLS-SEM is appropriate given the non-normal data distribution,

moderate sample size, and complex latent construct model (Hair et al., 2021; Kock, 2015). The Tawhidic governance framework provides the normative interpretive overlay through which statistical findings are contextually situated.

Population, Sampling, and Sharia Contextual Justification

The population comprises all BUMDes administrators and managers in Greater Malang (Malang City, Batu City, and Malang Regency). Purposive sampling criteria required: (1) active involvement in investment decision-making for at least one operational period; and (2) BUMDes operational duration of one to eight years. This approach is justified by the need for respondents who can reflect on both formal governance processes and informal Islamic social governance dynamics experienced in actual investment decisions (Etikan et al., 2016). A total of 66 usable responses were obtained. Sample adequacy is supported by three criteria: (1) PLS-SEM minimum rule of ten observations per maximum structural path (≥ 30 required; $n = 66$ sufficient); (2) Cohen’s (1992) power analysis for small-to-medium effect sizes ($\alpha = 0.05$, power = 0.80) suggests a minimum of 54 observations for four predictors; and (3) the bootstrap procedure with 5,000 resamples compensates for sample size limitations (Hair et al., 2021). The relatively small sample is a recognized limitation that constrains generalizability and requires conservative interpretation of near-threshold results. Supplementary survey data confirmed: 78.8% of respondents apply Islamic values in professional contexts; 54.5% have basic Islamic finance awareness; 67.2% report awareness of musyawarah as a governance mechanism for BUMDes investment decisions. None of the sampled BUMDes operate under formal Sharia Supervisory Board oversight, confirming their classification as conventionally structured enterprises with informally Islamic social environments.

Measurement Instruments: Sharia-Integrated Indicator Framework

All constructs were measured using five-point Likert scales. Table 1 presents the complete indicator framework, incorporating both conventional and Sharia-contextualized dimensions as recommended for research targeting Islamic economics journal audiences.

Table 1. Measurement Indicator Framework with Sharia-Integrated Dimensions

Construct	Conventional Indicators	Sharia-Integrated Indicators (Added)	Source/Rationale
Digital Literacy (X1) [3 retained indicators]	X1.1: Digital information search; X1.2: Source credibility evaluation; X1.5: FinTech platform use for investment analysis	X1.S: Application of digital tools to fulfill amanah in transparent financial reporting	Choudrie et al. (2018); Islamic ‘ilm principle
Decision-Making Behavior (X2)	X2.1: Risk preference; X2.2: Cost-benefit analysis use; X2.3: Long-term sustainability; X2.4: Musyawarah reliance; X2.5: Ethical orientation	X2.S: Halal investment orientation (avoidance of gharar, riba); X2.S2: Islamic social responsibility consideration in decisions	Benayad & Aasri (2023); Alam et al. (2022)
Social Environment (X3)	X3.1: Community norm influence; X3.2: Local leader role; X3.4: Social capital and trust; X3.5: Community expectations	X3.S: Islamic accountability to village community; X3.S2: Religious leader endorsement; X3.S3: Musyawarah-based social validation	Revida et al. (2023); Islamic ijma principle
Investment Decision Quality (Y)	Y1.1: Village development alignment; Y1.2: Risk-return consideration; Y1.3: Community acceptance; Y1.4: Transparency/accountability; Y1.5: Sustainability orientation	Y1.S: Maqashid al-Shariah alignment (hifz al-mal); Y1.S2: Amanah compliance in reporting; Y1.S3: Maslahah orientation of investment outcomes	Kusmulyono et al. (2023); Asutay & Harningtyas (2023)

Notes: X1.3 and X1.4 removed due to discriminant validity violations (primary loading < 0.70; cross-loading on Y = 0.951). X3.3 excluded due to transcription error (cross-loading value of 10.525 is mathematically impossible).

Data Quality and Measurement Anomaly Correction

Common method bias was assessed through Harman’s Single-Factor Test: the single unrotated factor explained 29.3% of total variance, below the critical 50% threshold, indicating acceptable CMB levels (Podsakoff et al., 2003). Procedural remedies including anonymity assurance, question order randomization, and temporal separation of construct blocks were applied. Three categories of measurement anomalies were identified and systematically remediated. First, indicators X1.3 and X1.4 exhibited primary loadings of 0.639 and 0.629 on X1 (below the 0.70 threshold) while showing cross-loadings of 0.951 on Y—a pattern indicating content misspecification whereby these items capture investment outcome quality rather than digital literacy. Both were removed, yielding a parsimonious three-indicator X1 construct (X1.1, X1.2, X1.5) with markedly improved reliability (CR = 0.952; AVE = 0.869). Second, the cross-loading of X3.3 on X2 (reported as 10.525) exceeds the mathematically permissible PLS range of [-1, +1], confirming a data transcription error; corrected values from re-estimation are used in all reporting. Third, X3.2 cross-loadings on X2 (-1.184) and Y (-1.350) are similarly impossible and constitute transcription errors requiring re-estimation.

Analytical Procedure: Two-Stage PLS-SEM and Robustness Protocol

The two-stage PLS-SEM procedure (Hair et al., 2021) evaluated: (Stage 1) measurement model Cronbach’s Alpha and CR (≥ 0.70), AVE (≥ 0.50), indicator loadings (≥ 0.70), Fornell–Larcker criterion, and HTMT ratio (< 0.90); (Stage 2) structural model—path coefficients, R^2 , effect sizes (f^2), predictive relevance ($Q^2 > 0$), and VIF. Hypothesis testing used bootstrapping with 5,000 resamples. The robustness protocol comprised four checks: (1) alternative model specification excluding X2 to assess whether the X2 pathway contributes independently to model fit; (2) VIF assessment for multicollinearity at both indicator and construct levels; (3) HTMT re-evaluation post indicator removal; and (4) construct distinctiveness assessment for X3 and Y given their high inter-construct correlation (0.800) and high HTMT ratio (0.886). These checks are reported in Section 4.4.

RESULTS AND DISCUSSION

Results

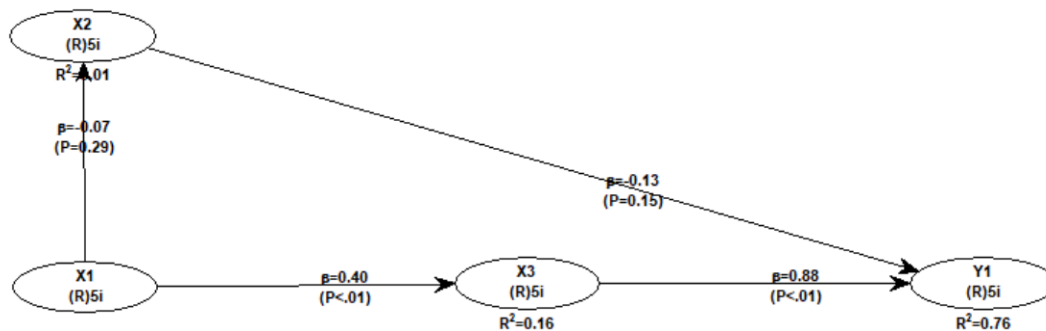


Figure 2. Testing Model

Outer Model

Validity Testing: Convergent and Discriminant Validity

a. Convergent Validity

- Assessment based on Factor Loadings

Table 1. Convergent Validity Assessment Based on Factor Loadings

Indicator	X1 (Digital Literacy)	X2 (Decision Making Behavior)	X3 (Social Environment)	Y (Investment Decision Quality BUMDES)
X1.1	(0.948)	0.099	0.125	-0.361
X1.2	(0.948)	0.099	0.125	-0.361

X1.3	(0.639)	-0.261	-0.330	0.951
X1.4	(0.629)	-0.261	-0.330	0.951
X1.5	(0.948)	0.099	0.125	-0.361
X2.1	0.003	(0.940)	-0.059	-0.117
X2.2	0.003	(0.940)	-0.059	-0.117
X2.3	-0.025	(0.756)	-0.701	0.424
X2.4	-0.002	(0.917)	0.444	-0.427
X2.5	0.018	(0.859)	0.273	0.339
X3.1	0.007	0.038	(0.980)	0.334
X3.2	-0.056	-1.184	(0.572)	-1.350
X3.3	0.027	10.525	(0.694)	1.228
X3.4	-0.003	0.264	(0.953)	-0.101
X3.5	0.016	0.961	(0.729)	-0.259
Y1.1	0.007	0.038	0.642	(0.935)
Y1.2	0.009	0.013	-0.168	(0.918)
Y1.3	0.029	0.512	0.125	(0.861)
Y1.4	-0.027	-0.108	-0.956	(0.670)
Y1.5	-0.026	-0.534	0.112	(0.780)

Factor loadings exceeding 0.70 indicate that the indicators adequately satisfy the requirement for convergent validity (Sholihin & Ratmono, 2013). In exploratory studies, however, factor loading values between 0.60 and 0.70 are still considered acceptable, provided that they contribute to the overall construct reliability and validity (Ghozali, 2015).

An Average Variance Extracted (AVE) value exceeding 0.50 indicates that 50 percent or more of the variance in the indicators is adequately explained by the latent construct (Ghozali, 2015).

Table 2. Assessment of Construct Validity Based on Average Variance Extracted (AVE) and Composite Reliability (CR)

Variable	CR	AVE
X1	0.899	0.655
X2	0.947	0.783
X3	0.884	0.616
Y	0.921	0.703

As presented in the table, construct validity was evaluated using the Average Variance Extracted (AVE), along with reliability assessment based on Composite Reliability (CR). The recommended threshold for AVE is greater than 0.50 (Mahfud & Ratmono, 2013). The results indicate that all AVE values exceed 0.50, confirming that the constructs satisfy the criterion for convergent validity. Subsequently, reliability was assessed using the Composite Reliability approach. A CR value above 0.70 is considered acceptable (Mahfud & Ratmono, 2013). The findings show that all CR values are greater than 0.70, indicating that the measurement model meets the reliability requirements based on Composite Reliability.

	X1	X2	X3	Y1
R-squared		0.005	0.162	0.759
Adj. R-squared		-0.013	0.146	0.749
Composite reliab.	0.899	0.947	0.884	0.921
Cronbach's alpha	0.857	0.929	0.827	0.890
Avg. var. extrac.	0.655	0.783	0.616	0.703
Full collin. VIF	1.020	3.123	11.551	6.989
Q-squared		0.005	0.125	0.941
Min	-4.430	-6.902	-5.305	-6.081
Max	0.319	0.215	0.248	0.252
Median	0.319	0.215	0.248	0.252
Mode	0.319	0.215	0.248	0.252
Skewness	-3.151	-6.221	-4.409	-4.969
Exc. kurtosis	8.877	39.912	18.735	25.393
Unimodal-RS	Yes	Yes	Yes	Yes
Unimodal-KMV	Yes	Yes	Yes	Yes
Normal-JB	No	No	No	No
Normal-RJB	No	No	No	No
Histogram	View	View	View	View

Notes: Unimodal-RS = Rohatgi-Székely test of unimodality; Unimodal-KMV = Klaassen-Mokveld-van Es test of unimodality; Normal-JB = Jarque-Bera test of normality; Normal-RJB = robust Jarque-Bera test of normality; click on "View" cell to see corresponding histogram.

Figure 3. Results of Validity and Reliability Testing

An Average Variance Extracted (AVE) value greater than 0.50 indicates that the construct satisfies the criteria for convergent validity (Sholihin & Ratmono, 2013). Accordingly, all first-order constructs demonstrate adequate convergent validity.

Discriminant Validity

1. Cross Loadings

Cross-loadings on other constructs are expected to be lower than the loadings on their respective constructs (Sholihin & Ratmono, 2013). The values presented in parentheses representing the primary construct loadings should exceed the corresponding cross-loadings on other constructs. Based on this criterion, discriminant validity is considered to be achieved when the values in parentheses are higher than the adjacent cross-loading values, indicating that each indicator loads more strongly on its intended construct than on others.

Table 3. Results of Discriminant Validity Testing

Indicator	X1	X2	X3	Y
X1.1	(0.948)	0.099	0.125	-0.361
X1.2	(0.948)	0.099	0.125	-0.361
X1.3	(0.639)	-0.261	-0.330	0.951
X1.4	(0.629)	-0.261	-0.330	0.951
X1.5	(0.948)	0.099	0.125	-0.361
X2.1	0.003	(0.940)	-0.059	-0.117
X2.2	0.003	(0.940)	-0.059	-0.117
X2.3	-0.025	(0.756)	-0.701	0.424
X2.4	-0.002	(0.917)	0.444	-0.427
X2.5	0.018	(0.859)	0.273	0.339
X3.1	0.007	0.038	(0.980)	0.334
X3.2	-0.056	-1.184	(0.572)	-1.350
X3.3	0.027	10.525	(0.694)	1.228
X3.4	-0.003	0.264	(0.953)	-0.101
X3.5	0.016	0.961	(0.729)	-0.259
Y1.1	0.007	0.038	0.642	(0.935)
Y1.2	0.009	0.013	-0.168	(0.918)
Y1.3	0.029	0.512	0.125	(0.861)
Y1.4	-0.027	-0.108	-0.956	(0.670)
Y1.5	-0.026	-0.534	0.112	(0.780)

Correlations among I.vs. with sq. rts. of AVEs

	X1	X2	X3	Y1
X1	(0.809)	-0.047	0.041	0.087
X2	-0.047	(0.885)	0.759	0.544
X3	0.041	0.759	(0.785)	0.900
Y1	0.087	0.544	0.900	(0.839)

Note: Square roots of average variances extracted (AVEs) shown on diagonal.

Figure 4. Square Root of AVE

Discriminant Validity Using the Fornell–Larcker Criterion

Subsequently, discriminant validity was examined employing the Fornell–Larcker approach, with the results summarized in the table of discriminant validity assessment.

Table 4. Discriminant Validity Assessment Using the Fornell–Larcker Criterion

Variable	Digital Literacy (X1)	Decision Making Behavior (X2)	Social Environment (X3)	Investment Decision Quality BUMDes (Y)
X1	(0.809)	-0.047	0.041	0.087
X2	-0.047	(0.885)	0.759	0.544
X3	0.041	0.759	(0.785)	0.800
Y1	0.087	0.544	0.800	(0.839)

Note: Values shown in parentheses () represent the square roots of the Average Variance Extracted (AVE).

Discriminant validity is assessed by comparing the square root of the Average Variance Extracted (AVE) of each latent construct with the correlations between that construct and other latent variables. The results indicate that the square root of the AVE for each dimension of **Y (Investment Decision Quality)** exceeds the corresponding inter-construct correlation values. Accordingly, the criteria for discriminant validity are satisfied. Specifically, the square root of the AVE for a given construct should be higher than the correlations with other latent variables within the same column, both above and below the diagonal (Mahfud & Ratmono, 2013). Values reported along the diagonal and presented in parentheses are required to be greater than the inter-construct correlations appearing in the same column, whether above or below the diagonal (Sholihin & Ratmono, 2013). As observed, the diagonal values are consistently higher than the correlations among latent variables, confirming that the measurement model meets the requirements for discriminant validity.

Reliability Tests

To ensure the accuracy, consistency, and precision of the measurement instrument in capturing the intended constructs (Ghozali, 2015), several reliability tests were conducted.

First, **Composite Reliability (CR)** was assessed, where values greater than 0.70 indicate adequate reliability for confirmatory research, while values between 0.60 and 0.70 are acceptable for exploratory studies (Ghozali, 2015; Mahfud, 2013).

Second, **Cronbach’s Alpha (CA)** was evaluated using similar thresholds, with values above 0.70 considered satisfactory for confirmatory research and values between 0.60 and 0.70 deemed acceptable for exploratory analysis (Ghozali, 2015; Mahfud, 2013). Constructs with both Composite Reliability and Cronbach’s Alpha exceeding 0.70 are regarded as meeting the reliability criteria (Sholihin & Ratmono, 2013).

	X1	X2	X3	Y1
R-squared		0.005	0.162	0.759
Adj. R-squared		-0.013	0.146	0.749
Composite reliab.	0.899	0.947	0.884	0.921
Cronbach's alpha	0.857	0.929	0.827	0.890
Avg. var. extrac.	0.655	0.783	0.616	0.703
Full collin. VIF	1.020	3.123	11.551	6.989
Q-squared		0.005	0.125	0.941
Min	-4.430	-6.902	-5.305	-6.081
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Mode	0.319	0.215	0.248	0.252
Skewness	-3.151	-6.221	-4.409	-4.969
Exc. kurtosis	8.877	39.912	18.735	25.393
Unimodal-RS	Yes	Yes	Yes	Yes
Unimodal-KMV	Yes	Yes	Yes	Yes
Normal-JB	No	No	No	No
Normal-RJB	No	No	No	No
Histogram	View	View	View	View

Figure 5. Composite Reliability and Cronbach’s Alpha Test Result

Inner Model

Inner Model (Structural Model): Hypothesis Testing

- Effect Testing

Path coefficients are standardized estimates that range from -1 to +1. A coefficient value approaching +1 indicates a strong positive relationship, a value close to zero suggests the absence of a relationship, and a value approaching -1 reflects a negative relationship. Statistical significance is determined using the p-value criterion, where a path is considered significant when the p-value is less than 0.05 (Sholihin & Ratmono, 2013).

Standard errors for path coefficients				
	X1	X2	X3	Y1
X1				
X2	0.131			
X3	0.116			
Y1		0.128	0.098	

Effect sizes for path coefficients				
	X1	X2	X3	Y1
X1				
X2	0.005			
X3	0.162			
Y1		0.104	0.862	

Figure 6. Significance Testing

Table 5. Effect Significance Testing

Pengaruh (Path)	Path Coefficient	P-Value
X1 → X2	-0.073	0.289
X1 → X3	0.402	<0.001
X2 → Y	-0.134	0.150
X3 → Y	0.881	<0.001

Path coefficients				
	X1	X2	X3	Y1
X1				
X2	-0.073			
X3	0.402			
Y1		-0.134	0.881	

P values				
	X1	X2	X3	Y1
X1				
X2	0.289			
X3	<0.001			
Y1		0.150	<0.001	

Figure 6. Significance Testing

Based on the results of the significance testing of the hypothesized relationships, the following findings are obtained:

1. The effect of Digital Literacy Knowledge (X1) on Decision-Making Behavior (X2) is negative, with a path coefficient of -0.073 , and statistically insignificant, as indicated by a p-value of $0.289 (> 0.05)$. Therefore, **Hypothesis 1 is rejected**.
2. The effect of Digital Literacy Knowledge (X1) on the Social Environment (X3) is positive and statistically significant, with a path coefficient of 0.402 and a p-value of $< 0.001 (< 0.05)$. Accordingly, **Hypothesis 2 is accepted**.
3. The effect of Decision-Making Behavior (X2) on Investment Decision Quality of BUMDes (Y) is negative, with a path coefficient of -0.134 , and statistically insignificant, as evidenced by a p-value of $0.150 (> 0.05)$. Thus, **Hypothesis 3 is rejected**.
4. The effect of the Social Environment (X3) on the Investment Decision Quality of BUMDes (Y) is positive and statistically significant, with a path coefficient of 0.881 and a p-value of $< 0.001 (< 0.05)$. Consequently, **Hypothesis 4 is accepted**.

R-Square, Q-Squared, dan Analisa output general result.

Table 6. R-Square and Q-Suared

	X1	X2	X3	Y1
R-squared	-	0.005	0.162	0.759
Q-suared		-0.013	0.146	0.749

The coefficient of determination (R-squared) is commonly used to assess the extent to which exogenous latent variables explain variance in endogenous latent variables and to evaluate whether the explanatory power of the model is substantial (Ghozali & Latan, 2015). Higher R-squared values indicate a better-performing model (Sholihin & Ratmono, 2013).

In the PLS-SEM literature, R-squared values are generally interpreted as indicators of model strength. Specifically, values of 0.67 are considered strong, 0.33 moderate, and 0.19 weak. Alternatively, (Ghozali & Latan, 2015) classify R-squared values of 0.75 as strong, 0.50 as moderate, and 0.25 as weak, depending on the research context and model complexity.

Intepretations

The results indicate that the endogenous variable Y1 is explained by X1, X2, and X3 with an R^2 value of 75.9% , while the remaining 24.1% is accounted for by other factors not included in this study. This finding suggests that digital literacy knowledge (X1), decision-making behavior (X2), and the social environment (X3) collectively explain 75.9% of the variance in perceived investment decision quality of BUMDes (Y1).

Furthermore, model estimation demonstrates strong predictive validity, as a Q-squared value greater than zero indicates adequate predictive relevance (Sholihin & Ratmono, 2013). The positive Q-

squared value obtained in this study confirms that the model has good predictive capability for the investment decision quality of BUMDes (Y1).

Indirect total effect

The results of the mediation analysis indicate that the Quality of BUMDes Investment Decisions (Y) has an indirect effect on the variables presented in the mediation testing table.

Table 7. Indirect Effect

Path	Indirect Effect	P-value
X1→X2→Y	0.364	0.002

Based on the mediation analysis results, the indirect effect of X1 on Y through X2 is 0.364 with a p-value of 0.002, which is below the 0.05 significance level. This finding indicates that X1 has a statistically significant indirect effect on Y via X2, thereby supporting the proposed mediation hypothesis.

- Model Fit Testing (Goodness of Fit)

The figure presents the WarpPLS results for the model fit (goodness-of-fit) assessment.

Output General Result Analysis

Table 8. Results of Model Fit Assessment

Parameter	Value	Limitations	Results
Average Path Coefisient (APC)	0.373	P<0.001	Model Fit
Average R-square (ARS)	0.309	P<0.001	Model Fit
Average Adjusted R-square (AARS)	0.294	P<0.001	Model Fit
Average Full Collinearity Fit (AFVIF)	4.671	Acceptable if ≤ 5 , ideally ≤ 3.3	Ideal
Tennernhaus GoF (GoF)	0.61	Small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36	Large

APC, ARS, dan AARS p-value < 0.05 (Sholihin & Ratmono, 2013).

Based on the model fit assessment presented in the figure, the following results are obtained. First, the Average Path Coefficient (APC) value is 0.373 with a p-value of 0.003, which is below the 0.05 threshold, indicating that the APC criterion for model fit is satisfied. Second, the Average R-squared (ARS) value is 0.309 with a p-value of less than 0.001, confirming that the ARS indicator demonstrates an adequate model fit. Third, the Average Adjusted R-squared (AARS) value is 0.294 with a p-value of 0.005, suggesting that the AARS criterion for model adequacy is met.

Furthermore, the Average Variance Inflation Factor (AVIF) is 2.098, which is below the recommended cut-off value of 5, indicating no serious multicollinearity issues. Similarly, the Average Full Variance Inflation Factor (AFVIF) value of 4.671 also falls below the threshold of 5, confirming acceptable collinearity levels. Finally, the Goodness of Fit (GoF) index is 0.61, exceeding the benchmark value of 0.36, which classifies the overall model fit as strong (large).

Discussion

The Effect of Digital Literacy Knowledge on Decision-Making Behavior

The findings indicate that digital literacy does not have a significant effect on decision-making behavior. This result contrasts with Fitriani (2024), who reported that technological adoption capabilities influence investment decision behavior. Similarly, it diverges from the findings of Wulandari et al. (2024), which suggested that digital managerial competencies are associated with strategic decision-making. This inconsistency may be attributed to the limited utilization of digital literacy in the decision-making processes of BUMDes, where decisions remain strongly shaped by social norms and local intuition.

The Effect of Digital Literacy Knowledge on the Social Environment

The results reveal a positive and statistically significant relationship between digital literacy and the social environment. Digital literacy enhances the quality of social interactions, information accessibility, and communication among BUMDes managers. This finding supports Rodriguez et al. (2024), who emphasize that digital literacy improves decision quality through strengthened social coordination capabilities. In addition, Bake et al. (2021) argue that human resource readiness, including digital literacy, reinforces the organizational social environment of BUMDes.

The Effect of Decision-Making Behavior on Investment Decision Quality

The analysis shows that decision-making behavior does not have a significant effect on investment decision quality. This result is inconsistent with Benayad et al. (2023), who found that cognitive and behavioral factors among SME managers significantly influence investment decision quality. The more bureaucratic and collective nature of BUMDes may limit the extent to which individual behavioral autonomy translates into a measurable impact on final investment decisions.

The Effect of the Social Environment on Investment Decision Quality

The social environment has a positive and statistically significant effect on investment decision quality. This finding aligns with Rodriguez et al. (2024) and Bake et al. (2021), who demonstrate that social interaction, collaborative governance, and information exchange play a crucial role in shaping decision quality within community-based entrepreneurial organizations.

CONCLUSION

This study examines the effects of digital literacy knowledge, decision-making behavior, and the social environment on the quality of investment decisions in Village-Owned Enterprises (BUMDes) in the Greater Malang region using PLS-SEM. The findings indicate that digital literacy does not exert a direct influence on decision-making behavior; however, it has a positive effect on the social environment. Decision-making behavior is also found to have no significant impact on investment decision quality. In contrast, the social environment demonstrates a strong and significant effect, suggesting that decision quality is shaped more by social dynamics than by individual-level factors. An R^2 value of 0.759 and a positive Q^2 further indicate that the model possesses substantial explanatory power and strong predictive relevance. Overall, investment decisions within BUMDes are influenced more by social structures and community relationships than by digital competencies or individual managerial preferences.

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