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Accounting Information Systems, Internal Controls, and Morality in Preventing MSME Fraud

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Abstract:

Research aim
This study examines the effects of accounting information systems, internal controls, and individual morality on accounting fraud prevention in Micro, Small, and Medium Enterprises (MSMEs) in Pekanbaru City.

Design/Methodology/Approach
A quantitative approach was employed using primary data collected through questionnaires distributed to MSME owners and managers. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 to assess the relationships among variables.

Findings
The results indicate that accounting information systems, internal controls, and individual morality significantly influence accounting fraud prevention. Accounting information systems demonstrate the strongest effect, highlighting the critical role of technological and systemic mechanisms in reducing fraud opportunities. Internal controls function as structural safeguards, while individual morality strengthens ethical decision-making, collectively supporting fraud mitigation in MSMEs.

Originality/Value
This study extends Fraud Triangle Theory by integrating systemic, structural, and individual dimensions within the MSME context of an emerging economy. It contributes to governance and accounting literature by providing empirical evidence that fraud prevention in small businesses is not solely driven by internal controls but also by technological systems and ethical values.

Research Limitations/Implications
The study is limited to MSMEs in Pekanbaru City and applies a cross-sectional design. Future research may expand the geographical scope, include additional variables, and adopt mixed-method approaches to capture deeper behavioral dynamics.

Keywords: accounting information systems, internal control, individual morality, prevention of accounting fraud

Introduction

The acceleration of globalization and digital transformation has significantly increased the importance of financial information transparency in sustaining organizational performance. In highly interconnected markets, stakeholders rely heavily on credible financial reporting to assess organizational viability and governance quality (Stafford et al., 2020). The rapid dissemination of information across jurisdictions further intensifies reputational exposure and regulatory scrutiny (Adinugroho & Susilowati, 2022). Within this environment, accounting fraud represents a substantial threat to organizational credibility and institutional trust.

Accounting fraud refers to the deliberate manipulation or misrepresentation of financial information for personal or organizational gain (Kurniawan et al., 2023). Such misconduct may involve concealment, falsification, or abuse of authority within financial reporting processes (Albrecht et al., 2019). Because financial information is produced within delegated authority systems, individuals managing accounting processes may exploit informational asymmetries. Fraud risk, therefore, is embedded not only in technical weaknesses but also in structural and behavioral vulnerabilities.

The consequences of accounting fraud extend beyond financial loss. Internally, fraudulent practices undermine ethical culture, weaken managerial accountability, and reduce employee confidence (Maisyarah & Adli, 2022). Externally, fraud diminishes investor trust and may destabilize broader economic systems (Wang & Lin, 2023). As argued by Odufisan et al. (2025), fraud should be understood as a governance failure that erodes long-term organizational resilience and innovation capacity. Consequently, fraud prevention becomes a strategic governance priority rather than merely a compliance function.

Effective fraud prevention requires both ethical reinforcement and systematic risk mitigation. Albrecht et al. (2019) emphasize the importance of cultivating integrity-based cultures while conducting proactive fraud risk assessments. Romney et al. (2021) further argue that preventive mechanisms must reduce opportunities, enhance detection capacity, and limit potential losses. However, evidence from the Association of Certified Fraud Examiners (ACFE, 2024) shows that implementation remains uneven. While large organizations widely adopt formal fraud prevention programs, small entities demonstrate significantly lower adoption rates, and overall loss reduction remains partial. This suggests that structural mechanisms alone may not ensure effective fraud mitigation.

The issue is particularly salient in Micro, Small, and Medium Enterprises (MSMEs). Compared to large corporations, MSMEs typically operate with overlapping managerial roles, limited segregation of duties, and informal governance structures. Such characteristics may alter the effectiveness of conventional fraud prevention mechanisms. Yet, empirical evidence in this context remains limited.

Previous studies examining determinants of fraud prevention report inconsistent findings. Internal control systems are found to significantly reduce fraud risk in several studies (Dimitrijevic et al., 2015; Paino et al., 2023; Yuniarti, 2017), but other research reports insignificant effects (Muliza & Astuti, 2023). Similar inconsistencies are observed in studies of accounting information systems (Ahmad, 2019; Florid et al., 2023; Nugroho & Andhaniwati, 2022; Ridwan et al., 2023) and individual morality (Khoirunnisa et al., 2024; Kuntadi et al., 2023; Nur et al., 2023). These contradictions suggest that fraud prevention effectiveness may be contingent upon organizational context and governance structure.

Despite the growing body of literature, three important gaps remain. First, prior research predominantly examines accounting information systems, internal controls, and individual morality separately, limiting the explanatory capacity of Fraud Triangle Theory, which conceptually emphasizes the interaction between opportunity, pressure, and rationalization.

Empirical models integrating systemic (AIS), structural (internal control), and behavioral (morality) dimensions within a unified framework are still scarce.
Second, inconsistencies in empirical findings indicate that theoretical assumptions derived from COSO-based control frameworks may not uniformly apply across organizational scales. Contextual contingencies, particularly in small business environments, remain insufficiently explored.

Third, MSMEs as governance units in emerging economies receive limited scholarly attention in fraud prevention research, despite their economic significance and structural vulnerability. The way fraud prevention mechanisms operate under resource constraints and informal control systems remains under-theorized.

This study addresses these gaps by examining the combined influence of accounting information systems, internal controls, and individual morality on accounting fraud prevention within MSMEs. Theoretically, the study advances Fraud Triangle Theory by integrating systemic, structural, and behavioral dimensions into a single governance-based explanatory model. Practically, the findings provide evidence-based insights for policymakers and MSME owners in designing more effective fraud prevention strategies in emerging economy contexts.

Literature Review and Hypotheses Development

Theoretical Foundation

This study is grounded in Fraud Triangle Theory introduced by Cressey (1953), which posits that fraud arises from the interaction of three core elements: pressure, opportunity, and rationalization. Pressure refers to internal or external incentives that motivate individuals to commit fraud; opportunity emerges from weaknesses in systems or controls; and rationalization reflects the individual's justification of unethical behavior. Among these elements, opportunity is considered the most controllable through organizational design and governance mechanisms, while rationalization is closely related to individual ethical orientation. Pressure, particularly work-related or financial stress, may also be mitigated through transparent governance and reliable information systems.

Fraud Triangle Theory provides an integrative lens to explain how accounting information systems, internal controls, and individual morality interact in shaping fraud risk (Batkunde & Dewi, 2022). A robust accounting information system (AIS) reduces information asymmetry and narrows opportunities for manipulation; effective internal controls limit procedural weaknesses that create opportunities; and strong individual morality constrains rationalization processes. Thus, systemic, structural, and behavioral dimensions operate simultaneously in influencing fraud prevention.

Accounting fraud itself refers to deliberate misrepresentation of financial information for personal or organizational gain (Albrecht et al., 2019; Arens et al., 2017). It involves intentional deception, abuse of authority, and violation of ethical and regulatory standards (Rahardjo, 2018). Romney et al. (2021) identify key characteristics of accounting fraud, including material misstatements, intentional deception, and harm to affected parties.

Preventing accounting fraud requires proactive organizational efforts aimed at reducing opportunities and strengthening integrity within accounting systems (Romney et al., 2021). Prevention is widely recognized as the most cost-effective strategy for minimizing fraud losses (Albrecht et al., 2019). Such efforts must be proactive, integrity-oriented, and sustainability-driven to ensure organizational continuity (Pamungkas, 2023).

Accounting Information System and accounting fraud

According to Romney et al. (2021), an accounting information system is a system that collects, records, stores, and processes data into information that can be used for decision making. Romney also explains that accounting information systems have six components, namely people, procedures and instructions, data, software, information technology infrastructure, internal controls, and security measures.

The fraud triangle theory developed by Cressey (1953) states that accounting fraud tends to be caused by three main factors, namely pressure, opportunity, and rationalization. An integrated SIA makes it possible to reduce work pressure and opportunities for perpetrators to commit fraud (Romney et al., 2021). A good ISA has transparency and an objective reporting system that can track unusual activities, thereby reducing rationalization (Gelinas et al., 2017).

When transactions are systematically documented and traceable, there is less room for manipulation. In other words, accounting information systems not only improve efficiency, but can also change the structure of opportunities for accounting fraud within an organization.
Referring to the studies by Nugroho & Andhaniwati (2022) and Florid et al. (2023) and Ahmad (2019), it was found that accounting information systems have an effect on the prevention of accounting fraud.
H_1: Accounting information systems influence the prevention of accounting fraud

Internal Control and Accounting Fraud

The Committee of Sponsoring Organizations of the Treadway Commission (COSO) in its Internal Control Integrated Framework (2013) defines internal control as a series of processes carried out by the board of directors, management, and all personnel of an organization. Internal control supports entities in achieving important objectives, creating resilience, and improving performance (COSO, 2013).

Based on the fraud triangle theory, opportunity is considered the element most controlled by organizations through the implementation of effective internal controls. As stated by Romney et al. (2021), internal controls are designed to reduce the opportunity for fraud through various mechanisms, such as segregation of duties, authorization systems, periodic monitoring, and internal audits. In line with the statement by Soedarsono and Sonhaji (2023), internal controls can significantly narrow the gap for fraud in financial statements.

Unlike accounting information systems that are system-based, internal control is governance-based constraint. If AIS builds technology-based transparency, internal control builds procedural and structural-based constraints. Thus, internal control functions as a formal

institutional barrier that narrows the scope of discretion and the probability of successful accounting fraud.
Based on research conducted by Paino et al. (2023), supported by Florid et al. (2023); Kuntadi et al. (2023); and Yuniarti (2017), it was found that internal control affects the prevention of accounting fraud.
H_2: Internal control affects the prevention of accounting fraud

Individual Morality and accounting fraud

Individual morality refers to the norms and values that guide an individual's perception of right and wrong, shaping their ethical decision-making and behavior (Treviño et al., 2006, 2014). Similar to what Driver (2006) stated, individual morality refers to a set of principles or standards that guide a person's actions and character, especially in the context of how those actions affect the welfare of others.

From the perspective of the fraud triangle theory, individual morality can act as an internal barrier that prevents rationalization, thereby inhibiting the process of fraud (Kaptein, 2008). In addition, organizations that instill ethical values through integrity-based leadership can strengthen morality in the work environment (Valentine & Barnett, 2003).
In this context, morality acts as a psychological self-regulation mechanism that blocks rationalization. When individuals are unable to justify dishonest actions to themselves, fraud does not occur even when pressure and opportunity exist. This is the role of morality in the fraud triangle.

Several studies have revealed a relationship between individual morality and the prevention of accounting fraud. In studies conducted by Kuswati (2023) and Kuntadi et al. (2023), it was found that individual morality influences the prevention of accounting fraud.
H_3: Individual morality influences the prevention of accounting fraud

Researh Model

Based on the synthesis of the above theories, this study proposes that the prevention of accounting fraud does not depend on a single mechanism, but on a combination of structural and psychological mechanisms. Accounting information systems are presented as a technology that reduces opportunity, internal controls act as procedural opportunity constraints, and individual morality acts as psychological rationalization suppression.

By integrating these three variables into the Fraud Triangle framework, this study fills a gap in the literature or previous studies. Therefore, the main contributions of this study include the following. First, it provides a theoretical integration of SIA, internal control, and individual morality within the Fraud Triangle framework. Second, it explains causal mechanisms, not just statistical relationships. Finally, it positions fraud prevention as the result of the interaction between structural constraints and internal moral control.

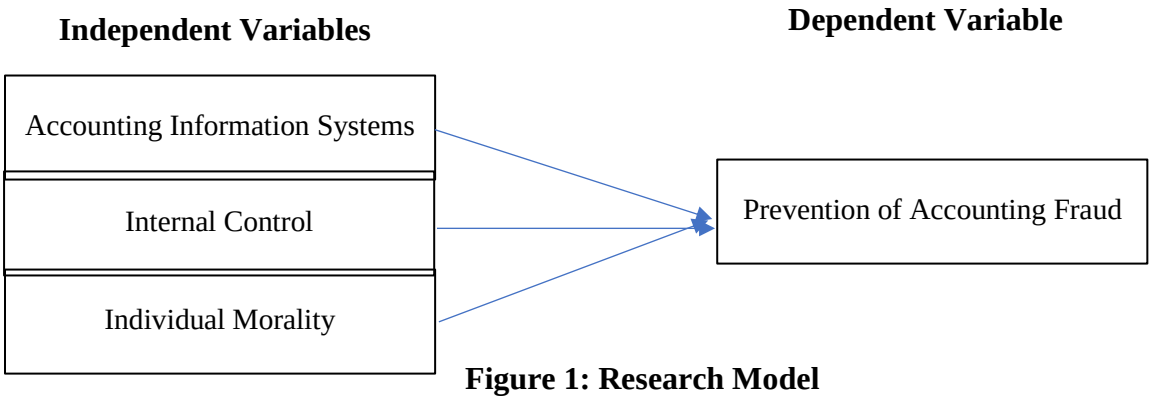

Figure 1: Research Model

Research Method

Research Design

This study employs an explanatory quantitative research design, as it aims to examine and explain the casual relationships between accounting information system, internal control, individual morality and accounting fraud prevention. Unlike descriptive research, which focuses on portraying characteristics of a phenomenon, explanatory research seeks to test theoretically grounded hypotheses and analyze cause-effect relationships among constructs. Given that this study is grounded in the Fraud Triangle framework, the design is appropriate for empirically testing how structural and psychological factors influence accounting fraud prevention mechanism. This study also uses a cross-sectional approach, where data were collected at a single point in time from MSMEs in Pekanbaru City.

Unit of Analysis

The unit of analysis in this study is the individual level, specifically MSME owner or employees involved in financial recording, reporting or internal control processes. Although the research context is organizational (MSMEs), the constructs measured–accounting information systems implementation, internal control effectiveness, individual morality and fraud prevention practices–are captured through the perceptions and experiences of individual respondents. Therefore, the level of analysis is individual, while the unit observation consists of MSME owner and staff. Clarifying this distinction ensures methodological consistency between theoretical constructs and measurement of empirical.

Population and Sampling Technique

The population of this study comprises MSME owners and employees involved in financial management activities in Pekanbaru City. Because the exact number of individuals responsible for accounting and financial functions within MSMEs is not officially documented and can be considered large and indeterminate, this study employs Cochran's (1977) sampling formula to

estimate the minimum required sample size for large or unknown populations (Sugiyono, 2022). Cochran's approach is appropriate when the population size is unknown and the study aims to estimate population parameters with a specified margin of error and confidence level. Using a 95% confidence level and a 5% margin of error, the minimum required sample size was calculated to be 384 respondents. A total of 354 usable questionnaires were returned and included in the final analysis, representing a response rate of 92%. Although slightly below the calculated minimum, this sample size remains statistically adequate for Partial Least Squares Structural Equation Modeling (PLS-SEM), as it exceeds the recommended threshold of ten times the maximum number of structural paths directed at a single construct (Hair et al., 2019). Therefore, the sample satisfies both statistical representativeness considerations and methodological requirements for SEM-PLS analysis.

Measurement of Variables

All construct were measured using multi-item indicators adapted from established literature to ensure content validity. All variables in this study were measured using a Likert scale consisting of 5 levels of response preference, including: 1 (never/strongly disagree), 2 (rarely/disagree), 3 (sometimes/disagree), 4 (often/agree), and 5 (always/strongly agree). An explanation of each variable can be seen in the table below.

Table 1. Operationalization of Research Variables

Variables	Definition	Indicators	Scale
Prevention of Accounting Fraud (Y)	Fraud prevention measures are proactive activities aimed at reducing, or even eliminating, various potential causes of irregularities or non-compliance that could threaten the integrity and continuity of the organization (Pamungkas, 2023).	1. Proactive measures 2. Reducing or eliminating potential irregularities 3. Maintaining organizational integrity 4. Ensuring organizational continuity (Pamungkas, 2023)	Ordinal
Accounting Information System (X1)	An accounting information system refers to a system that collects, records, stores, and processes data into information that can be used for decision making (Romney et al., 2021).	1. People 2. Procedures and instructions 3. Data 4. Software 5. Information technology infrastructure (Romney et al., 2021).	Ordinal
Internal Control (X2)	Internal control refers to a process that permeates every operational activity of an organization and is an integral part of management activities to help the organization achieve its objectives (Romney et al., 2021).	1. Control environment 2. Risk assessment 3. Control activities 4. Information and communication 5. Monitoring activities (COSO, 2013).	Ordinal

Individual Morality (X3)	Individual morality refers to a system formed by a person's rational thinking to distinguish right from wrong that does not depend on social norms, but is based on justice and human welfare (Turiel, 1983).	1. Trustworthiness 2. Fairness 3. Welfare 4. Responsibility (Fuchs et al., 2025; Hardin, 2002; Maltezou-Papastylianou et al., 2025; Parziale et al., 2025; Schwartz, 2005).	Ordinal

Source: Processed by author, 2025

Data Analysis Technique

This study employs Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS 4 to examine the relationships among accounting information systems, internal controls, individual morality, and accounting fraud prevention. The selection of PLS-SEM over Covariance-Based SEM (CB-SEM) is grounded in both methodological and analytical considerations. First, the study is prediction-oriented, aiming to assess the extent to which the proposed exogenous variables explain variance in fraud prevention. PLS-SEM is particularly suitable for predictive and exploratory research that emphasizes maximizing explained variance (R^2) rather than strict theory confirmation (Hair et al., 2019; Hair et al., 2022). Second, the structural model involves multiple latent constructs measured by several indicators, making PLS-SEM appropriate for estimating complex relationships efficiently while maintaining statistical power. Third, PLS-SEM does not require multivariate normality assumptions, which enhances robustness in survey-based research contexts.

The evaluation procedure follows a two-stage approach: assessment of the measurement model and assessment of the structural model. For reflective constructs, reliability and convergent validity are examined using outer loadings (≥ 0.70), composite reliability (≥ 0.70), and average variance extracted (AVE ≥ 0.50). Discriminant validity is assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait ratio (HTMT) (Hair et al., 2019). The structural model is evaluated based on path coefficients, t-statistics obtained through bootstrapping, coefficient of determination (R^2), effect size (f^2), and collinearity diagnostics (VIF < 3).

To strengthen predictive assessment, this study also considers predictive relevance (Q^2) and PLSpredict procedures, consistent with recent methodological recommendations (Hair et al., 2022). These combined criteria ensure both explanatory adequacy and predictive robustness of the proposed model.

Results and Discussion

Results

In this study, the respondents selected were business owners or employees/staff working in MSMEs. The characteristics of the respondents in this study were observed based on two

indicators, namely gender and age. The ratio of male to female respondents was 45.2% or 160 people for male respondents based on the returned and processed questionnaires. Meanwhile, female respondents accounted for 54.8% or 194 people. Furthermore, the age indicator was grouped into several age ranges. The 17-25 age group had the most respondents at 53% or 189 people, followed by the 26-35 age group at 40% (141 people), the 36-45 age group at 5% (18 people), and the 46-55 age group at 2% (2 people). The details are shown in the table below.

Table 2. Respondent Characteristics

No	Characteristics	Informations	Frequency	Ratio
1	Gender	Male	160	45,2%
		Female	194	54,8%
	Total		**354**	**100%**
2	Age	17^{th}-25^{th} years old	189	53%
		26^{th}-35^{th} years old	141	40%
		36^{th}-45^{th} years old	18	5%
		46^{th}-55^{th} years old	6	2%
		> 55^{th} years old	0	0%
	Total		**354**	**100%**

Source: Processed by author, 2025

Table 3. Descriptive Statistic Test Result

Variabel	N	Mean	Min.	Max.	Std. Deviation
Accounting Information System	354	3.615	1.000	5.000	0.741
Internal Control	354	3.497	1.600	5.000	0.788
Individual Morality	354	4.048	2.000	5.000	0.654
Prevention of Accounting Fraud	354	3.768	2.250	5.000	0.584

Source: Processed using SmartPLS 4

Table 3 presents the results of descriptive statistical analysis for all variables studied, including sample quantity, minimum and maximum values, mean, and standard deviation. The results obtained show that, in general, respondents have a positive view of accounting information systems, internal controls, individual morality, and accounting fraud prevention. This is evident from the standard deviation values, which are consistently small, indicating that the responses or views of respondents are generally similar across all research variables.

Outer Model Evaluation

To determine whether the research instrument used is appropriate and valid in measuring what should be measured, testing is required, in this case validity testing. It is also necessary to ensure that the research instrument used is consistent when used repeatedly under similar conditions, which requires reliability testing. Both tests can be seen in the following Table 4:

Table 4. Validity and Reliability Test

Variable	Indicators			Reliability			AVE Validity
	Total	Valid	Not Valid	Outer Loading	Cronbach's alpha	Composite reliability	
Accounting Information System	5	5	-	0.827-0.846	0.896	0.923	0.706
Internal Control	5	5	-	0.843-0.865	0.910	0.933	0.735
Individual Morality	4	4	-	0.737-0.846	0.823	0.881	0.650
Prevention of Accounting Fraud	4	4	-	0.726-0.822	0.765	0.849	0.584
Rule of thumb				0.7	0.7	0.7	>0.5

Source: Processed using SmartPLS 4

The test results shown in the table above indicate that the validity test conducted based on the overall outer loading values is above the minimum requirement (rule of thumb) of >0.7, although values below 0.7 to 0.5 are still tolerable (Hair, et al., 2019). Similarly, the validity test based on the AVE value is also above the minimum value (>0.5), so that overall the research instrument is declared valid. In addition, for the results to be declared valid, the square root of the AVE value must exceed the inter-construct correlation, and each indicator must show the highest value of the other indicator-construct correlations. This can be seen in the Fornell-Larcker criteria test and in the cross loading.

Next, for the reliability test, you can see the Cronbach's alpha values and composite reliability values in the table. Both Cronbach's alpha and composite reliability values are above the minimum requirement (0.7), so the research instrument is considered reliable (consistent). Thus, based on the results of the two tests, namely the validity test and the reliability test, the data is suitable for further evaluation of the structural model.

To see the predictive ability of the model on the endogenous construct, an R-Square (R^2) and Q-Square (R^2) analysis can be performed. The R^2 value ranges from 0 to 1, with a higher value indicating that the model has stronger predictive power. Similarly, the Q^2 value shows the extent to which the observed values can be accurately reconstructed by the model.

Table 5. R-Square and Q-Square Test

Dependent Variable	Analysis	Value
Prevention of Accounting Fraud	R-Suare (R^2)	0.520
Prevention of Accounting Fraud	Q-Square (Q^2)	0.505

Source: Processed using SmartPLS 4

Inner Model Evaluation

The R-Square (R^2) value of 0.520 indicates that approximately 52% in moderate category of the variation in the accounting fraud prevention construct can be explained by three independent variables in the model, namely accounting information systems, internal controls, and individual morality (Hair, et al., 2019). Furthermore, the Q-Square (Q^2) value of 0.505 or

equal to 50.5% indicates that the model has strong predictive power for the accounting fraud prevention construct (Hair, et al., 2019).
To see the extent of the influence of each independent variable on the dependent variable, an F-Square (F^2)/effect size analysis or test can be performed. The results of the F-Square test can be seen in the following table:

Table 6. Effect Size Test Result

Relationships between Variables	*F-Square*	Conclusion
AIS (X1) → PAF (Y)	0.444	Strong
IC (X2) → PAF (Y)	0.307	Moderate
IM (X3) → PAF (Y)	0.245	Moderate

Source: Processed using SmartPLS 4

The following is an evaluation table of the structural model or hypothesis test showing that the three variables studied have an effect on the prevention of accounting fraud. Each hypothesis (H1 to H3) is accepted.

Results of Hypothesis Testing

The results of the structural model assessment are presented in Table 7, which summarizes the hypothesis testing outcomes, including path coefficients, t-statistics, p-values, and effect sizes.

Table 7. Hypothesis Test

No	Hypothesis	Original sample (O)	Sample mean (M)	Std. deviation	T statistics	P values
H_1	**X1 -> Y**	0.455	0.458	0.037	12.438	0.000
H_2	**X2 -> Y**	0.382	0.382	0.035	10.941	0.000
H_3	**X3 -> Y**	0.352	0.352	0.037	9.615	0.000

Source: Processed using SmartPLS 4

The hypothesis testing results indicate that all proposed hypotheses are supported. Hypothesis 1 (H1), which posits that Accounting Information Systems (AIS) positively influence accounting fraud prevention, is accepted ($t = 12.407 > 1.96$; $p < 0.001$), with a strong effect size ($f^2 = 0.444$), indicating that AIS is the most dominant predictor in the model. Hypothesis 2 (H2), which proposes that internal control positively affects accounting fraud prevention, is also accepted ($t = 10.878 > 1.96$; $p < 0.001$), with a moderate effect size ($f^2 = 0.307$). Likewise, Hypothesis 3 (H3), which states that individual morality positively influences accounting fraud prevention, is accepted ($t = 10.011 > 1.96$; $p < 0.001$), with a moderate contribution ($f^2 = 0.245$). These findings confirm that systemic (AIS), structural (internal control), and behavioral (individual morality) factors significantly contribute to strengthening fraud prevention mechanisms in MSMEs.

Discussion

The empirical findings demonstrate that accounting information systems (AIS), internal controls, and individual morality significantly contribute to accounting fraud prevention in

MSMEs. Collectively, these results support the multidimensional logic of Fraud Triangle Theory (Cressey, 1953), which posits that fraud arises from the interaction of opportunity, pressure, and rationalization. The evidence suggests that fraud prevention is most effective when systemic, structural, and behavioral mechanisms operate simultaneously rather than independently.

Among the examined predictors, AIS exhibits the strongest influence on fraud prevention. This finding underscores the critical role of technological infrastructure in constraining opportunity, which is considered the most controllable element of the fraud triangle. A well-designed AIS enhances transparency, ensures timely recording, embeds automated controls, and generates digital audit trails, thereby narrowing discretionary space for manipulation (Romney et al., 2021; Gelinas et al., 2017). In MSME settings, where segregation of duties and formal governance mechanisms are often limited, AIS may function as a structural substitute for organizational complexity. These results are consistent with prior empirical studies reporting the preventive function of AIS (Ahmad, 2019; Florid et al., 2023; Nugroho & Andhaniwati, 2022), although they contrast with findings suggesting insignificant effects (Ridwan et al., 2023). The dominance of AIS indicates that technology-embedded controls may be more robust than procedural safeguards in small business environments.

Internal control also significantly enhances fraud prevention, reinforcing its central role in governance systems. Effective monitoring mechanisms, clear separation of responsibilities, and structured procedures reduce opportunities for fraudulent behavior (Romney et al., 2021). These findings align with empirical evidence from Dimitrijevic et al. (2015), Paino et al. (2023), Kabue & Aduda (2017), Yuniarti (2017), and Florid et al. (2023), which highlight the preventive capacity of internal control systems. However, the moderate effect size suggests that internal controls, particularly in MSMEs, may be constrained by limited formalization and reliance on managerial oversight. This contextual limitation may explain inconsistencies in previous findings, such as those reported by Muliza & Astuti (2023).

Individual morality likewise plays a significant role in fraud prevention by constraining rationalization processes. Moral values shape ethical judgment and reduce the likelihood that individuals justify fraudulent acts (Albrecht et al., 2019; Kaptein, 2008). The findings are consistent with studies by Kuntadi et al. (2023) and Kuswati (2023), which emphasize the importance of ethical orientation in mitigating fraud risk, although they differ from results reported by Nur et al. (2023). In the context of MSMEs, where interpersonal relationships and trust-based management are prevalent, individual morality becomes particularly relevant as an internal governance mechanism.

Overall, the study extends Fraud Triangle Theory by empirically demonstrating that opportunity-reducing mechanisms embedded within technological systems (AIS) exert a stronger influence than procedural (internal control) or behavioral (morality) mechanisms in MSME settings. This suggests that fraud prevention in resource-constrained organizations may depend more heavily on system-based governance architecture than on formal control documentation alone. The findings therefore contribute to the governance literature by highlighting the strategic importance of digital accounting infrastructure in strengthening fraud mitigation capacity within emerging economy MSMEs.

Conclusion

This study demonstrates that accounting information systems (AIS), internal controls, and individual morality significantly contribute to accounting fraud prevention in MSMEs. The findings indicate that systemic, structural, and behavioral mechanisms operate simultaneously in reducing fraud risk, with AIS emerging as the most influential predictor. The model explains 52% of the variance in accounting fraud prevention ($R^2 = 0.520$) and shows substantial predictive relevance ($Q^2 = 0.505$), confirming the robustness of the proposed framework.

The results extend Fraud Triangle Theory by empirically demonstrating that opportunity-constraining mechanisms embedded within technological systems may exert a stronger influence than procedural controls or individual ethical factors in small business environments. While prior studies often emphasize internal control as the primary governance instrument, this study suggests that system-based controls integrated within digital accounting infrastructure may provide a more structurally resilient mechanism for limiting fraud opportunities, particularly in MSMEs characterized by limited segregation of duties and informal governance arrangements. By integrating technological, structural, and behavioral dimensions into a unified explanatory model, this study advances the application of Fraud Triangle Theory within emerging economy contexts.

From a practical perspective, the findings imply that strengthening digital accounting systems should be prioritized alongside internal control development and ethical awareness programs. For policymakers, the results suggest that initiatives promoting technological adoption in MSMEs may yield more substantial fraud prevention outcomes than compliance-based control training alone. At the organizational level, integrating AIS implementation with governance procedures and ethical reinforcement strategies can enhance the sustainability of fraud mitigation efforts.

This study is limited to MSMEs in Pekanbaru City, which may restrict the generalizability of the findings to other regions with different socio-economic conditions. The model focuses on three predictors, whereas fraud prevention may also be influenced by additional organizational and contextual variables. Furthermore, the cross-sectional and quantitative design limits deeper exploration of behavioral dynamics and changes over time. Future research may expand geographical coverage, incorporate additional determinants such as organizational culture or technological sophistication, and adopt longitudinal or mixed-method approaches to provide a more comprehensive understanding of fraud prevention mechanisms in small business environments.

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