JPEKA: Jurnal Pendidikan Ekonomi, Manajemen dan Keuangan
Homepage : https://journal.unesa.ac.id/index.php/jpeka
e-ISSN : 2579-5716

Vol. 10, No. 2, November 2026
Page 189-204

JPEKA: Jurnal Pendidikan Ekonomi, Manajemen dan Keuangan

Digital Transformation in Indonesian Life Insurance: Examining the Role of AI-Based Verification Capability in Enhancing the Relationship Between KYC Performance and Risk Assessment Accuracy

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DOI: https://doi.org/10.26740/jpeka.v10n2.p189-204

Sections Info

Article history:
Submitted: June 08, 2026
Final Revised: July 27, 2026
Accepted: August 04, 2026
Published: August 05, 2026

Keywords:
Digital transformation
Artificial intelligence
KYC performance
Risk assessment accuracy
Life insurance

ABSTRACT

***Objective**: This study examines how AI-Based Verification Capability, as a digital transformation capability, enhances the relationship between Know Your Customer (KYC) Performance and Risk Assessment Accuracy in Indonesian life insurance companies. The study addresses the growing need for insurers to improve customer due diligence, asset verification, fraud detection, and underwriting quality amid increasing regulatory requirements and digital transformation initiatives. **Method**: The study adopts a quantitative research approach using a cross-sectional survey of managers and executives working in underwriting, compliance, risk management, claims, information technology, and digital transformation functions within Indonesian life insurance companies. Data will be analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine direct and mediating relationships among the constructs. **Results**: The proposed model suggests that KYC Performance positively influences both AI-Based Verification Capability and Risk Assessment Accuracy. Furthermore, AI-Based Verification Capability is positively affecting Risk Assessment Accuracy and mediate the relationship between KYC Performance and Risk Assessment Accuracy. Organizations with stronger digital verification capabilities are deriving greater strategic value from KYC processes through enhanced data validation, fraud detection, and risk profiling. **Novelty**: This study contributes to the strategic management and digital transformation literature by conceptualizing AI-Based Verification Capability as a digital transformation capability that converts compliance-oriented KYC activities into strategic risk intelligence. The study extends Dynamic Capabilities Theory and Information Processing Theory within the context of the Indonesian life insurance industry.*

INTRODUCTION

The insurance industry is experiencing significant transformation driven by technological innovation, regulatory developments, and increasing customer expectations. In Indonesia, life insurance companies face growing pressure to strengthen Know Your Customer (KYC) processes due to regulatory requirements (Wulandari et al., 2025) concerning anti-money laundering (AML), fraud prevention, and risk governance as per the Financial Services Authority of the Republic of Indonesia Regulation Number 8 of 2023 regarding the Implementation of the Anti-Money Laundering, Counter-Terrorist Financing, and Counter-Proliferation of Weapons of Mass Destruction Program in the Financial Services Sector. Effective KYC implementation enables insurers to identify policyholders, verify beneficial ownership, assess customer profiles, and conduct ongoing monitoring activities (Savitha et al., 2019; Shetty et al., 2022; Zhao, 2020). However, traditional KYC procedures frequently rely on manual verification processes, creating challenges related to efficiency, consistency, and information accuracy (Malhotra et al., 2022).

Simultaneously, digital transformation has become a strategic priority for insurance organizations (Nasution et al., 2025; Oliveira E Sa et al., 2024). Advanced digital technologies such as artificial intelligence (AI), machine learning, predictive analytics, document recognition systems, and automated verification tools are transforming how insurers collect, process, and utilize customer information (Fatunmbi, 2024; Rao & Soofastaei, 2025). These technologies offer opportunities to enhance customer verification, validate insured assets, identify anomalies, and improve underwriting decisions (Rao & Soofastaei, 2025).

The implementation of Financial Services Authority Regulation No. 8 of 2023 has expanded insurers' responsibilities for customer due diligence, beneficial ownership verification, ongoing monitoring, and anti-money laundering compliance, thereby increasing the volume and complexity of customer information that must be processed. Despite growing investments in AI and digital transformation, limited research has examined how AI-enabled verification capabilities strengthen the strategic value of KYC processes within insurance organizations. Existing studies primarily focus on regulatory compliance, fraud prevention, or technological adoption independently (Abikoye et al., 2024). Consequently, insufficient attention has been given to understanding how KYC-generated information can be transformed into superior risk intelligence through digital transformation capabilities.

From a strategic management perspective, KYC should not be viewed merely as a compliance obligation (Ozioko, 2024). Rather, KYC represents an organizational capability for acquiring and maintaining valuable customer information (Elliott et al., 2022). The strategic value of this information depends on an organization's ability to process and utilize it effectively. AI-Based Verification Capability may therefore function as an important mechanism through which insurers transform customer information into more accurate risk assessments (Das, 2024).

This study aims to examine the relationships among KYC Performance, AI-Based Verification Capability, and Risk Assessment Accuracy in Indonesian life insurance companies. Specifically, the study investigates whether AI-Based Verification Capability mediates the relationship between KYC Performance and Risk Assessment Accuracy. By doing so, the study contributes to the literature on digital transformation, innovation management, and insurance risk management.

The concept of Know Your Customer (KYC) originally emerged from the economic logic of Information Asymmetry Theory, which argues that market inefficiencies arise when one party possesses more information than another (Airlangga et al., 2026; Akerlof, 1970; Galbraith, 1974; Spence, 1973; Stiglitz & Weiss, 1981; Takagi et al., 2025). In insurance markets, policyholders typically have superior knowledge regarding their risk characteristics, asset conditions, and behavioral tendencies (Cohen & Siegelman, 2010), creating information imbalances that may lead to adverse selection, moral hazard, and fraudulent activities. Consequently, KYC was initially developed as a regulatory and organizational mechanism to reduce information asymmetry through customer identification, verification, and due diligence processes (Mugarura, 2014). Over time, however, the role of KYC has evolved beyond regulatory compliance. Contemporary

strategic management literature increasingly recognizes KYC as an organizational information capability that enables firms to systematically acquire, validate, and maintain high-quality customer information (Arner et al., 2019). In this perspective, KYC performance reflects the effectiveness with which organizations generate reliable informational resources that can support strategic and operational decision-making.

The transformation of KYC from a compliance activity into a strategic capability has been accelerated by developments in digital transformation and artificial intelligence (Odunuga et al., 2024). Early technology adoption theories primarily viewed information technologies as tools for improving efficiency and reducing operational costs. More recent theoretical developments, particularly within Dynamic Capabilities Theory and Digital Transformation Theory, argue that technological resources create value only when they are embedded within organizational capabilities that enhance sensing, learning, and decision-making processes (Froehlich et al., 2025; Mele et al., 2024; Tobing et al., 2022). Within this context, AI-Based Verification Capability represents a higher-order digital capability that allows insurers to automate customer verification, validate insured assets, detect anomalies, and generate predictive insights from large volumes of customer data. Rather than functioning merely as a technological artifact, AI becomes an organizational mechanism through which firms transform raw information into actionable intelligence (Natta, 2025). This conceptualization aligns with contemporary views of digital transformation, which emphasize the strategic integration of advanced technologies into core business processes to improve organizational performance and create new sources of value (Ghosh, 2025; Wamba-Taguimdje et al., 2020).

The theoretical connection between KYC Performance and AI-Based Verification Capability can be explained through Information Processing Theory. Organizations operating in uncertain environments require effective mechanisms to collect, process, and utilize information in order to improve decision quality (Hossain, 2025). While KYC processes generate extensive customer and asset-related information, the value of such information depends on the organization's ability to process it efficiently and accurately (Jameaba, 2024). As insurance companies face increasing volumes of customer data and more complex risk profiles, traditional manual verification processes become insufficient. AI-based verification systems therefore emerge as a digital transformation capability that enhances organizational information-processing capacity by improving speed, consistency, scalability, and analytical depth (Aljehani et al., 2026; Nijhum, 2025). Consequently, organizations that demonstrate stronger KYC performance are likely to derive greater benefits from AI-based verification because the availability of high-quality customer information increases the effectiveness of AI-driven analytics and verification processes (Bello et al., 2026; Hossain, 2025).

The ultimate outcome of these interconnected capabilities is improved Risk Assessment Accuracy. Classical decision-making theories suggest that the quality of organizational decisions depends largely on the availability of relevant information and the ability to analyze that information effectively (Kobiyh & Amri, 2024; Litvaj et al., 2022; Morelli et al., 2022). In the insurance industry, risk assessment accuracy reflects the organization's capability to correctly evaluate customer risk profiles, predict potential

losses, identify fraudulent behavior, and make sound underwriting decisions (Rahul, 2023; Tafirenyika et al., 2025). Contemporary developments in analytics and digital intelligence further suggest that accurate risk assessment increasingly depends on advanced data processing capabilities rather than solely on human judgment (Ashal & Morshed, 2024; Beckley, 2025; Shah et al., 2023; Yazdi et al., 2024). Therefore, while KYC Performance provides the informational foundation necessary for risk evaluation, AI-Based Verification Capability acts as the transformational mechanism that converts customer information into risk intelligence (Das, 2024; Oko-Odion, 2025; Pattabhi, 2025; Rao & Soofastaei, 2025). This process enables insurers to reduce uncertainty, mitigate information asymmetry, and enhance the quality of underwriting and risk management decisions.

Taken together, the evolution of these concepts demonstrates a broader shift in organizational thinking from compliance-oriented risk management toward digitally enabled risk intelligence. KYC Performance serves as the foundational information capability, AI-Based Verification Capability functions as a digital transformation capability that enhances information processing and knowledge generation, and Risk Assessment Accuracy represents the strategic outcome of these combined capabilities. Integrating Information Asymmetry Theory, Information Processing Theory, Dynamic Capabilities Theory, and Digital Transformation Theory provides a comprehensive explanation of how insurance companies can leverage digital technologies to transform regulatory compliance activities into strategic assets that support superior risk management performance. This perspective is particularly relevant for Indonesian life insurance companies, which are increasingly investing in digital transformation initiatives to strengthen competitiveness, regulatory compliance, and data-driven decision-making capabilities.

RESEARCH METHOD

This study employs a quantitative explanatory research design and will employ Partial Least Squares Structural Equation Modeling (PLS-SEM) (J. Hair et al., 2019, 2022). The target population consists of managers involved in underwriting and claims, compliance, risk management, digital transformation, and information technology functions within 58 Indonesian life insurance companies based on the database of life insurance companies in Indonesia as per Indonesian Financial Services Authority latest database Quarter 3-year 2025.

Because all constructs were measured using a single questionnaire, procedural remedies were implemented to reduce the potential influence of common method variance. Respondents were assured of anonymity and confidentiality, participation was voluntary, and questionnaire items emphasized organizational practices rather than socially desirable responses. Data was collected through a structured questionnaire using a five-point Likert scale ranging from strongly disagree to strongly agree. Respondents from manager level from underwriting, risk and compliance, and digital transformation departments of the Indonesian life insurance companies were selected using purposive sampling as they were considered to possess knowledge and experience related to KYC implementation and digital verification practices and particularly on the direct

knowledge of the organizational capabilities examined. 109 responses were received and 86 data was validated (Memon et al., 2020) which were sufficient for this 16 indicators-based research (J. F. Hair et al., 2019). The data was collected from 1 January 2026 until 30 April 2026.

Research Variables and Hypotheses

This study investigates three interrelated constructs within the context of digital transformation in Indonesian life insurance companies, namely KYC Performance, AI-Based Verification Capability, and Risk Assessment Accuracy. KYC Performance refers to the effectiveness of organizational processes in identifying, verifying, and monitoring customers through activities such as customer identification, verification completeness, beneficial ownership verification, customer due diligence, and ongoing monitoring (Arner et al., 2019; Mugarura, 2014).

Drawing upon Information Asymmetry Theory, KYC Performance represents an organizational capability designed to reduce information gaps between insurers and policyholders by generating reliable and comprehensive customer information. As the quality of customer information improves, insurers are expected to possess a stronger informational foundation for managing risk and making underwriting decisions.

The second construct, AI-Based Verification Capability, represents the organization's ability to utilize artificial intelligence technologies to automate and enhance verification processes. This capability includes AI-driven identity verification, asset verification, automated document validation, predictive risk scoring, machine-learning-based anomaly detection, and real-time verification activities (Oko-Odion, 2025; Rao & Soofastaei, 2025). Grounded in Dynamic Capabilities Theory and Information Processing Theory, AI-Based Verification Capability is conceptualized as a higher-order digital transformation capability that enables organizations to process large volumes of customer information more efficiently and accurately. Rather than merely serving as a technological tool, AI functions as an organizational mechanism that transforms raw customer data into actionable intelligence capable of supporting strategic decision-making and risk evaluation.

The ultimate outcome examined in this study is Risk Assessment Accuracy, which reflects the insurer's ability to accurately classify customer risks, evaluate insured assets, identify fraudulent activities, improve underwriting decisions, and minimize assessment errors (Mita & Sultana, 2022; Rahul, 2023). Based on the theoretical framework, three hypotheses are proposed:

First, Know Your Customer (KYC) Performance reflects an organization's capability to acquire, verify, and maintain accurate customer information through systematic identification, due diligence, and continuous monitoring. According to Information Processing Theory (Galbraith, 1974; Takagi et al., 2025), the effectiveness of organizational decision-support systems depends fundamentally on the quality, completeness, and timeliness of the information they process. AI-Based Verification Capability relies on verified customer data as its primary input to perform automated identity validation, anomaly detection, fraud identification, and predictive verification.

Consequently, organizations with superior KYC Performance provide AI systems with higher-quality informational resources, enabling more accurate algorithmic processing and verification outcomes. From a Dynamic Capabilities Theory perspective (Teece, 2018), high-quality customer information constitutes a strategic organizational resource that enhances the firm's ability to integrate digital technologies into operational processes. Empirical studies have similarly demonstrated that the effectiveness of AI applications in financial services is highly dependent on the quality and reliability of underlying customer data (Rao & Soofastaei, 2025; Wamba-Taguimdje et al., 2020). Therefore, organizations exhibiting stronger KYC Performance are expected to develop more effective AI-Based Verification Capability, hence:

H1: KYC Performance positively influences AI-Based Verification Capability.

Second, Information Asymmetry Theory (Galbraith, 1974; Takagi et al., 2025) suggests that risk assessment improves when information asymmetry between insurers and policyholders is reduced through the acquisition of reliable customer information. Effective KYC processes enable insurers to verify customer identity, financial profiles, and behavioral characteristics, thereby reducing uncertainty associated with underwriting decisions. Likewise, Information Processing Theory argues that organizational decision quality depends on the availability of accurate and relevant information. Accordingly, organizations that perform KYC effectively should possess more complete and reliable customer information, theoretically improving the precision of risk classification and underwriting decisions. Prior empirical research has reported positive associations between customer information quality and improved financial risk evaluation (Rahul, 2023; Yazdi et al., 2024). However, because the complexity of modern insurance risks increasingly requires advanced analytical capabilities, the direct contribution of KYC Performance to Risk Assessment Accuracy remains an empirical question that warrants investigation, hence:

H2: KYC Performance positively influences Risk Assessment Accuracy.

Third, AI-Based Verification Capability enables insurers to process large volumes of structured and unstructured customer information using machine learning, predictive analytics, and automated verification technologies. According to Information Processing Theory, advanced analytical capabilities enhance organizational decision quality by transforming raw information into actionable knowledge. Furthermore, Dynamic Capabilities Theory argues that firms create competitive advantage by effectively integrating technological capabilities with organizational resources to improve operational performance. AI-driven verification systems facilitate anomaly detection, fraud identification, consistency checking, and predictive evaluation beyond the capacity of traditional manual assessment processes. Consequently, AI reduces human bias, improves consistency, and enhances the predictive accuracy of underwriting decisions. Previous studies consistently report that AI-enabled verification and predictive analytics significantly improve financial risk management, fraud detection, and underwriting effectiveness (Pattabhi, 2025; Rao & Soofastaei, 2025; Shah et al., 2023), hence:

H3: AI-Based Verification Capability positively influences Risk Assessment Accuracy.

These hypotheses, as modelled in Figure 1, reflect the proposition that superior risk assessment outcomes are achieved not only through effective customer due diligence but also through the organization's ability to transform customer information into risk intelligence through AI-enabled digital capabilities.

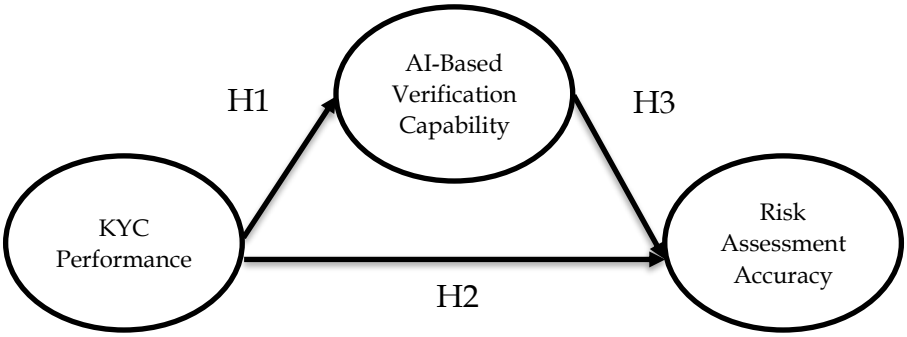

Figure 1. Research Model

RESULTS AND DISCUSSION

This section presents the empirical findings of the study in a systematic sequence corresponding to the analytical procedures employed in Partial Least Squares Structural Equation Modeling (PLS-SEM). The results begin with an assessment of the measurement model, including reliability and validity tests. Subsequently, the structural model is evaluated through hypothesis testing and effect size analysis to examine the relationships among KYC Performance, AI-Based Verification Capability, and Risk Assessment Accuracy. Together, these analyses provide the empirical basis for evaluating the proposed conceptual model and addressing the research objectives.

Table 1. Measurement Model Analysis

Construct	Items	Loadings	AVE	CR	Cronbach's Alpha
KYC Performance	Customer identification effectiveness	0.762	0.557	0.833	0.749
	Customer verification completeness	0.692			
	Beneficial ownership verification	0.527			
	Customer due diligence quality	0.786			
	Ongoing monitoring effectiveness	0.748			
AI-Based Verification Capability	AI-driven identity verification	0.717	0.507	0.834	0.762
	AI-driven asset verification	0.748			
	Automated document validation	0.647			
	Predictive risk scoring	0.603			
	Machine learning-based anomaly detection	0.648			
		0.683			

Construct	Items	Loadings	AVE	CR	Cronbach's Alpha
	Real-time verification capability				
Risk Assessment Accuracy	Accuracy of customer risk classification	0.729	0.652	0.903	0.865
	Accuracy of underwriting decisions	0.748			
	Fraud risk identification accuracy	0.810			
	Asset risk evaluation accuracy	0.865			
	Reduction of assessment errors	0.875			

Table 2. Hypotheses Testing

		t-value	p-value	Decision	f2	Effect size
H1	KYC Performance → AI-Based Verification Capability	19.458	0.000	Support	1.653	Large
H2	KYC Performance Capability → Risk Assessment Accuracy	0.824	0.410	Not Support	0.008	Small
H3	AI-Based Verification Capability → Risk Assessment Accuracy	3.257	0.001	Support	0.805	Large

The measurement model assessment demonstrates that all constructs satisfy the recommended reliability and validity criteria, confirming the adequacy of the instrument for structural model evaluation, as depicted in Table 1. KYC Performance achieved an Average Variance Extracted (AVE) of 0.557, Composite Reliability (CR) of 0.833, and Cronbach's Alpha of 0.749, while AI-Based Verification Capability recorded an AVE of 0.507, CR of 0.834, and Cronbach's Alpha of 0.762. Risk Assessment Accuracy exhibited the strongest measurement properties, with an AVE of 0.652, CR of 0.903, and Cronbach's Alpha of 0.865. Although several indicators displayed relatively moderate loading values, all remained within acceptable thresholds for exploratory and predictive research. The AVE values exceeding 0.50 indicate satisfactory convergent validity, while Composite Reliability and Cronbach's Alpha values above 0.70 confirm strong internal consistency reliability. These findings suggest that the indicators adequately capture the theoretical dimensions of KYC Performance, AI-Based Verification Capability, and Risk

Assessment Accuracy, thereby supporting the suitability of the measurement model for hypothesis testing.

As shown in Table 2, the structural model results reveal that KYC Performance exerts a strong and significant positive influence on AI-Based Verification Capability ($t = 19.458$, $p = 0.000$, $f^2 = 1.653$), supporting H1 and indicating that effective customer identification, verification, and due diligence processes provide the informational foundation necessary for developing advanced AI-enabled verification systems. In contrast, the direct relationship between KYC Performance and Risk Assessment Accuracy was not supported despite its positive direction, as the effect size was negligible ($f^2 = 0.008$), suggesting that customer information alone is insufficient to substantially improve risk assessment outcomes. Meanwhile, AI-Based Verification Capability significantly and positively influences Risk Assessment Accuracy ($t = 3.257$, $p = 0.001$, $f^2 = 0.805$), supporting H3 and demonstrating the critical role of AI technologies in transforming customer information into actionable risk intelligence. Collectively, the findings support Information Processing Theory, Dynamic Capabilities Theory, and Digital Transformation Theory by showing that KYC Performance primarily functions as an information-generation capability, whereas AI-Based Verification Capability acts as the transformational mechanism through which customer information is processed, validated, and converted into more accurate underwriting and risk management decisions.

Discussion

The structural model revealed that KYC Performance significantly enhanced AI-Based Verification Capability, which in turn significantly improved Risk Assessment Accuracy. However, contrary to the proposed hypothesis, the direct relationship between KYC Performance and Risk Assessment Accuracy was not statistically significant. The absence of a significant direct relationship suggests that KYC Performance generates valuable customer information but does not, by itself, improve organizational decision quality. Within contemporary insurance environments characterized by large volumes of heterogeneous customer data, verified information must first be processed, integrated, and interpreted before it becomes useful for underwriting decisions.

Consequently, AI-Based Verification Capability functions as the organizational information-processing mechanism that transforms KYC-generated information into actionable risk intelligence. This finding extends Information Processing Theory by demonstrating that information availability alone is insufficient unless complemented by advanced analytical capabilities.

The finding suggests that KYC activities alone do not automatically improve underwriting decisions unless the information generated through KYC is effectively processed and validated using AI-based verification technologies. Another important finding of this study is that KYC Performance did not exhibit a significant direct effect on Risk Assessment Accuracy, despite its positive relationship with AI-Based Verification Capability. This result suggests that effective customer identification, verification, and due diligence procedures alone are insufficient to improve organizational risk assessment.

Rather, the value of KYC-generated information depends on the organization's capability to validate, integrate, and analyze that information through AI-enabled verification systems. From an Information Processing Theory perspective, KYC produces

valuable customer data, but the information must be transformed into actionable knowledge before it can support complex underwriting decisions. Similarly, Dynamic Capabilities Theory suggests that organizations derive competitive value not merely from possessing information but from their ability to reconfigure and exploit informational resources (Cristofaro et al., 2025) through complementary technological capabilities. Consequently, the findings indicate that AI-Based Verification Capability serves as the critical organizational mechanism through which KYC Performance contributes to superior Risk Assessment Accuracy (Cristofaro et al., 2025; Teece, 2018). In this study, KYC Performance represents an operational information capability, while AI-Based Verification Capability represents a digital transformation capability that enhances organizational decision-making.

The study also supports Information Processing Theory (Payne, 1980). Effective KYC processes generate large volumes of customer and asset-related information (Huda et al., 2025). AI technologies improve an organization's capacity to process, analyze, and utilize this information, thereby increasing the accuracy of risk assessment outcomes (Kalogiannidis et al., 2024).

From a digital transformation perspective, the results suggest that AI should not be viewed merely as a technological investment (Lui et al., 2022). Rather, AI-based verification systems constitute strategic organizational capabilities that enable insurers to transform compliance activities into sources of competitive advantage (Das, 2024). Companies that successfully integrate AI into verification processes may improve underwriting quality, reduce fraud exposure, enhance customer trust, and strengthen regulatory compliance.

The study additionally contributes to Information Asymmetry Theory. Insurance transactions are characterized by unequal information between insurers and policyholders. Effective KYC combined with AI-enabled verification reduces information asymmetry by improving the accuracy, completeness, and reliability of customer information.

CONCLUSION

Fundamental Finding: This study proposes that AI-Based Verification Capability serves as a strategic digital transformation capability that strengthens the relationship between KYC Performance and Risk Assessment Accuracy in Indonesian life insurance companies. Effective KYC processes generate valuable customer information, while AI-based verification systems enhance the organization's ability to validate, analyze, and utilize that information for risk assessment purposes. **Implication:** This study extends Information Asymmetry Theory, Information Processing Theory, Dynamic Capabilities Theory, and Digital Transformation Theory by demonstrating that customer information generated through KYC processes creates strategic value only when supported by AI-Based Verification Capability. The findings indicate that KYC Performance alone is insufficient to significantly improve Risk Assessment Accuracy, highlighting the critical role of AI in transforming information into actionable risk intelligence. Managerially, life insurance companies should move beyond compliance-oriented KYC practices and invest in AI-driven verification, predictive analytics, and fraud detection systems. Regulators should also encourage digital verification ecosystems that enhance compliance effectiveness, underwriting quality, and overall risk management performance. **Limitation:** The study focuses exclusively on Indonesian life insurance

companies and examines a limited number of organizational capabilities. Future empirical findings may vary across insurance segments, regional comparative regulatory environments, and technological maturity levels. **Future Research:** Future studies may incorporate additional strategic management variables such as digital innovation capability, organizational agility, data governance capability, digital leadership, technological readiness, and organizational learning capability. Comparative studies between life insurance and life insurance companies or cross-country investigations within Southeast Asia may also provide valuable insights into digital transformation and risk intelligence development in the insurance industry.

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