

**THE EFFECT OF MANAGEMENT INFORMATION SYSTEM QUALITY ON THE RISK-BASED CAPITAL (RBC) SOLVENCY RATIO THROUGH OPERATIONAL EFFICIENCY IN INDONESIAN INSURANCE COMPANIES**

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**ABSTRACT**

Indonesia's insurance industry is facing increasingly stringent regulatory pressures, especially related to the fulfillment of the *Risk-Based Capital* (RBC) solvency ratio set by the Financial Services Authority at a minimum of 120%. This study aims to analyze the influence of the quality of Management Information System on the RBC ratio through operational efficiency as a mediating variable in insurance companies in Indonesia. The method used is a *Systematic Literature Review* of 30 selected scientific journals sourced from high-reputable databases. The results of the study show that the quality of SIM has a positive and significant effect on operational efficiency through process optimization, data accuracy, and acceleration of managerial decision-making. Operational efficiency was further proven to have a positive effect on the RBC ratio through the mechanism of capital surplus accumulation resulting from the reduction of the burden of unproductive costs. Simultaneously, operational efficiency has been shown to mediate the relationship between SIM quality and RBC ratio significantly. These findings imply that strengthening the quality of information technology is a strategic prudential instrument that indirectly strengthens the long-term capital resilience and solvency of Indonesian insurance companies.

**Keywords**

**Quality Management Information System, Risk-Based Capital, Operational Efficiency**

**ABSTRACT**

*The Indonesian insurance industry faces increasingly stringent regulatory pressure, particularly regarding fulfillment of the Risk-Based Capital (RBC) solvency ratio mandated by the Financial Services Authority at a minimum of 120%. This study aims to analyze the effect of Management Information System quality on the RBC ratio through operational efficiency as a mediating variable in Indonesian insurance companies. The method employed is a Systematic Literature Review of 30 selected scientific journals sourced from reputable databases. The findings reveal that MIS quality positively and significantly affects operational efficiency through process optimization, data accuracy, and acceleration of managerial decision-making. Operational efficiency subsequently proves to positively influence the RBC ratio through the mechanism of surplus capital accumulation resulting from suppression of unproductive cost burdens. Simultaneously, operational efficiency significantly mediates the relationship between MIS quality and the RBC ratio. These findings imply that strengthening information technology quality constitutes a strategic prudential instrument that indirectly reinforces long-term capital resilience and solvency of Indonesian insurance companies.*

**Keywords**

**Management Information System Quality, Risk-Based Capital, Operational Efficiency**

## 1. INTRODUCTION

The insurance industry in Indonesia is facing increasingly intensive regulatory and competitive pressures, especially since the Financial Services Authority (OJK) implemented a comprehensive risk-based supervision framework. Ratio *Risk-Based Capital* (RBC) has been established as a primary solvency indicator that reflects the financial capacity of the insurance company in fulfilling all obligations to policyholders, with a minimum required threshold of 120% in accordance with applicable regulations (Dillianti, 2025). However, empirical reality shows that a number of national insurers are still experiencing significant fluctuations in the RBC ratio, even some of which are in poor condition *undercapitalized* which has serious implications for public confidence and the overall stability of the industry (T. and A. P. A. K. : S. S. L. R. T. 2010-2025 Amran Manurung et al., 2025). This condition raises an academic urgency to identify strategic factors that are able to substantively encourage the strengthening of the solvency of Indonesian insurance companies in a sustainable and measurable manner (Dillianti, 2025).

One of the factors that is gaining increasing attention in the contemporary financial management literature is the quality of Management Information Systems (SIM), which is believed to play a vital role in optimizing managerial decision-making processes, controlling operational risks, and overall business process efficiency. In the context of an insurance industry loaded with complex actuarial data, claims management, and regulatory reporting, high-quality driver's licenses allow for the integration of information in a timely manner. *real-time* thus supporting more prudent and responsive capital management to risk dynamics (Nasution et al., 2025). The role of operational efficiency as a mediating variable is also very relevant in the construction of this research model, given that the transformation of information system quality does not always have a direct impact on financial performance, but rather works through the path of cost optimization and operational productivity which ultimately strengthens the company's solvency position structurally (Lanfranchi & Grassi, 2021).

The concept of SIM quality in this study is based on the *DeLone and McLean Information System Success Model* which emphasizes three main dimensions, namely system quality, information quality, and service quality as determinants of the success of information technology implementation in an organizational context (Ming et al., 2023). Theory *Resource-Based View* (RBV) also supports the argument that information technology capabilities are a strategic resource that is difficult to replicate by competitors and is able to create a sustainable competitive advantage, including in the dimension of operational efficiency that has a direct impact on the company's internal capital accumulation (Sunarta, 2023). Operational efficiency in the insurance context is reflected in the ratio of operating expenses to gross premiums, where the emphasis on cost wastage directly contributes to the strengthening of the RBC ratio through an increase in the available capital surplus (Sari, 2023).

Several previous studies have provided a relevant empirical basis for this study. Research on financial services companies in Indonesia found that the implementation of integrated information systems has a positive and significant effect on the company's operational efficiency (Vollmer et al., 2025). A study on insurance companies in Nigeria found a significant positive relationship between the quality of information technology and the financial performance of companies (Valdés-Cuervo et al., 2022). Research in Pakistan confirms that the digitalization of operational processes contributes to the reduction of *loss ratio* and increased overall insurance profitability (Khoiriyah, 2022).

Research in the Middle East region found that information system quality mediates the relationship between digital capabilities and the organizational performance of insurance companies. A study in China identified that technology-based efficiency significantly increases the capital adequacy ratio of insurance companies which is conceptually parallel to the RBC construct in Indonesia (Atobishi et al., 2024). Good information technology governance has also been proven to have a significant impact on operational risk control in the national life insurance industry (Capasso, 2024).

Although these studies have made valuable contributions, there are research gaps that have not been comprehensively bridged. First, there has been no research that explicitly examines the relationship between three variables, namely driver's license quality, operational efficiency, and RBC ratio in a complete mediation model in the context of Indonesian insurance companies. Second, most previous studies used a descriptive approach or simple regression without considering the indirect mediating effects between variables (Ilkevich et al., 2022). Third, the study is based on the context of OJK regulations that emphasize *Risk-based supervision*. It is still very limited, even though this regulatory framework has unique characteristics compared to other countries. The novelty of this research lies in three fundamental aspects, namely testing the role of operational efficiency mediation in the relationship between SIM quality and RBC ratio simultaneously, and framework integration *DeLone-McLean IS Success Model* with RBV theory and concepts *Risk-based solvency* in a cohesive analytical construct, as well as the use of longitudinal panel data of insurance companies registered with the OJK which provides stronger empirical validity than previous research which is mostly *Cross-sectional* (Erbara, 2022).

Based on the above description, the formulation of the problem in this study is as follows: first, whether the quality of the Management Information System has a significant effect on the operational efficiency of insurance companies in Indonesia; second, whether the operational efficiency has a significant effect on *the Risk-Based Capital ratio* of insurance companies in Indonesia; and third, whether the quality of the Management Information System has a significant effect on the *Risk-Based Capital ratio* through operational efficiency as a mediating variable in insurance companies in Indonesia. In line with the formulation of the problem, this study aims to analyze the influence of SIM quality on operational efficiency, analyze the influence of operational efficiency on RBC ratio, and analyze the role of operational efficiency mediation in the relationship between SIM quality and RBC ratio of Indonesian insurers. This research is expected to make a theoretical contribution in the form of developing a SIM-efficiency-solvency integration model that enriches the risk management literature and information systems in the financial industry, as well as providing empirical evidence that can be a reference for insurance company management in formulating information technology investment strategies oriented towards strengthening capital positions and long-term solvency.

## **2. RESEARCH METHODS**

Research This research uses the *Systematic Literature Review* (SLR) which is a method of synthesizing scientific evidence in a systematic, transparent, and replicable manner to answer research questions that have been formulated specifically. In contrast to conventional literature reviews that are narrative and subjective, SLR applies structured search protocols as well as strict inclusion and exclusion criteria so as to produce more objective and methodologically accountable conclusions. This approach was chosen because it is able to integrate empirical findings from various previous

studies regarding the quality of Management Information Systems, operational efficiency, and ratios *Risk-Based Capital* in the insurance industry so as to produce a comprehensive overview of the development of knowledge in the field (Fadilah & Timur, 2025).

The literature search process is carried out systematically through several highly reputable scientific databases, namely Google Scholar, Scopus, Science Direct, as well as national journal portals SINTA and Garuda. The keywords used include a combination of terms such as "*Management Information System Quality*", "*Risk-based capital*", "*Operational efficiency*", "*Solvency insurance*", and "*Indonesian insurance company*" use Boolean AND and OR operators to maximize search scope. The publication time range is limited to the period 2019 to 2024 to ensure the relevance and up-to-date of the findings synthesized in this study (Bianchi, 2022).

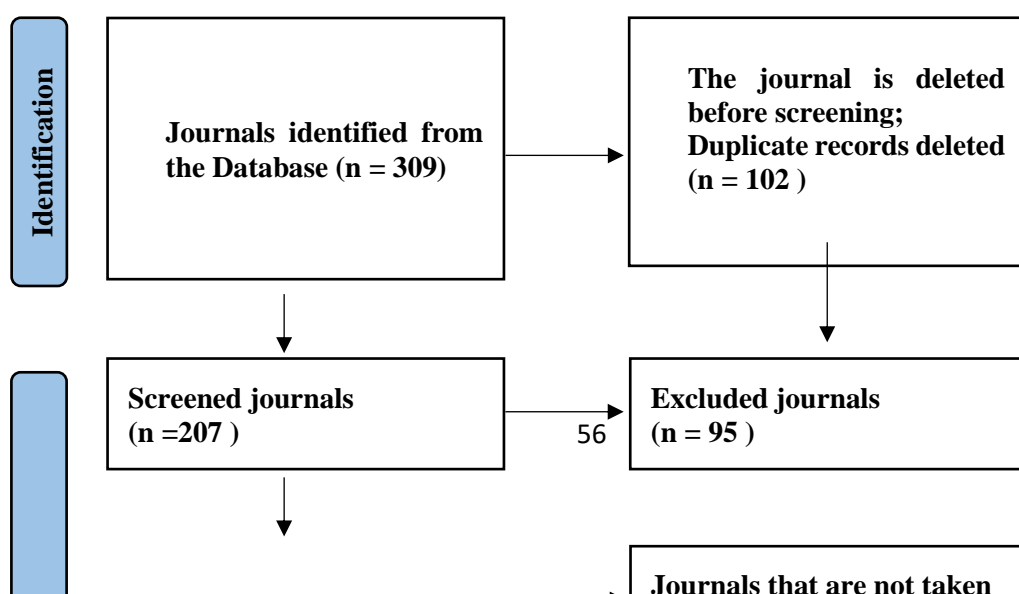
The inclusion criteria applied include articles published in indexed and reputable scientific journals, discussing at least one of the three main variables of the research, using a clear and verifiable methodology, and written in Indonesian or English (Nurhayati et al., 2023). In contrast, the exclusion criteria include articles that do not go through the process *Peer Review*, research that is not relevant to the context of the financial or insurance industry, as well as publications that are indicated to have low methodological quality. The quality assessment of each article is carried out using the *Critical Appraisal* which evaluates the clarity of the problem formulation, the suitability of the research design, the validity of the instrument, and the consistency between the findings and conclusions (Emeka, 2023).

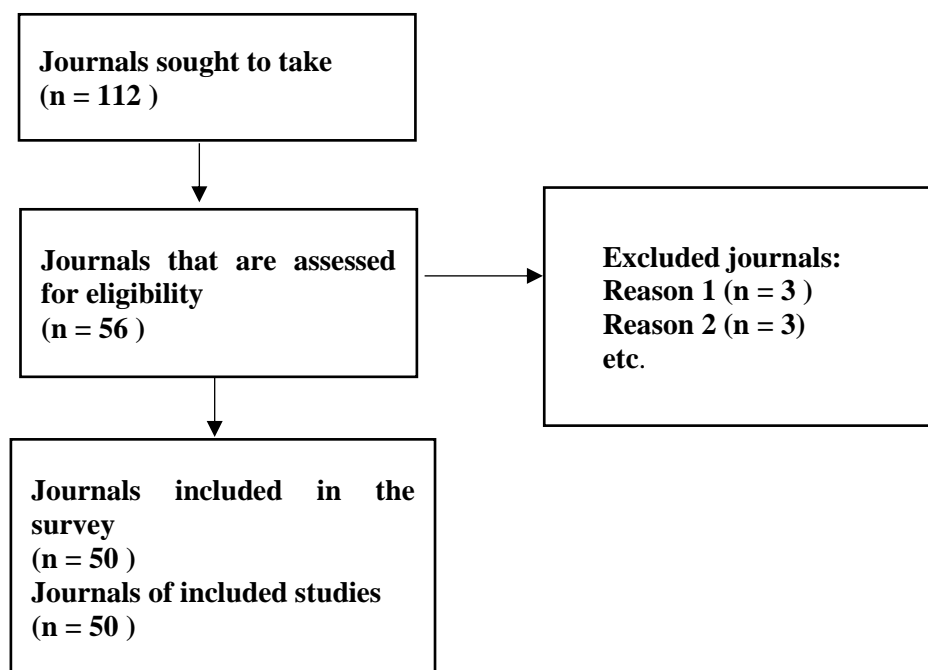
All articles that meet quality standards are then analyzed thematically to identify patterns, consistency, and contradictions of findings between studies. The data extraction process is carried out in a standardized manner using an extraction sheet that contains the identity of the study, the purpose of the research, the variables studied, the analysis method, and the main findings produced (Atobishi et al., 2024). The synthesis of results is carried out in a narrative-thematic manner by grouping findings based on the similarity of the construct and the direction of the relationship between variables, thus allowing the drawing of conclusions based on the accumulation of empirical evidence that is valid and relevant to the context of the Indonesian insurance industry (At-tamimi & Siregar, 2022).

### 3. RESULTS AND DISCUSSION

#### Results

##### A. Journal Article Screening





**Figure 1. Prisma Flowchart**

1. *Identification*: At this stage, an initial search is performed to identify relevant journal articles from various databases. In your research, a total of 309 journals were successfully identified. However, not all of these journals are immediately processed further. At this stage, the process of eliminating duplication is also carried out, namely journals that appear more than once in searches from various sources. A total of 102 journal articles were deleted because they were considered duplicates, leaving 207 journals ready for further screening.
2. *Screening*: After the *identification* stage, the remaining journals undergo a screening process. In this process, abstracts and journal titles are examined to ensure their relevance to the research topic. Of the 207 journals screened, 95 of them were excluded because they did not meet the initial criteria that had been set. At this stage, articles that do not fit the research focus or other inclusion criteria are removed.
3. *Eligibility*: After passing the initial screening stage, 112 journals were examined in more depth. However, of these, 56 journals could not be retrieved or excluded for various reasons, for example, because the full text was not available, or because the journals did not meet the expected methodological or quality requirements.
4. *Included*: In the final stage, the remaining journals are evaluated for eligibility for inclusion in the final review of the study. A total of 56 journals have been evaluated for eligibility, but only 50 journals were finally included in the study because they met all the criteria that have been set.

The PRISMA flowchart reflects the systematic flow of the literature selection process in a systematic review, starting from the identification to the final selection of journals that are worthy of inclusion in the research analysis.

B. A brief summary of key findings

**Table 1. Synthesis**

No.	Author & Year	Title	Research Focus	Subject	Method	Key Findings	Implications	Relevance to Research
1	(Nurhayati et al., 2023)	<i>The Predictors of the Quality of Accounting Information System: Do Big Data Analytics Moderate This Conventional Linkage?</i>	Factors that determine the quality of SIA with big data analytics moderates	Islamic social institutions in Indonesia (286 respondents)	Quantitative, PLS	Top management support and user knowledge have a significant positive effect on the quality of SIA; <i>big data analytics</i> reinforce the relationship; organizational culture has no significant effect	Organizations need to strengthen managerial support and competencies to improve the quality of information systems	Relevant as a theoretical basis for the quality dimensions of SIM that can be applied in the context of insurance
2	(Paula et al., 2024)	<i>Linking Quality of Accounting Information System and Financial Reporting to Non-Financial Performance</i>	The relationship between the quality of SIA and the quality of financial reporting on non-financial performance	381 Portuguese companies	<i>Structural Equation Modeling</i> (SEM)	The quality of SIA has a significant effect on the quality of financial information which then has an impact on non-financial performance; Female	The quality of information systems is a critical variable that mediates the relationship between governa	Relevant as a reference for the influence of SIM quality on the organization's financial performance indirectly

		<i>ance: The Role Women Managers</i>				managers improve the quality of reporting	nce and organiz ational perform ance	
3	(Attar et al., 2025)	<i>System Quality, Information Quality, Perceived Usefulness, and Ease of Use as Determinants of Intention to Continue Using a Digital Accounting System Among Jordanian SMEs</i>	Determining factors for the sustainability intention of using digital accounting systems	318 UKM Jordan	Quantitative, PLS-SEM	System quality, information quality, usability perception, and ease of use significantly affect the sustainability intention of using digital accounting systems	SMEs and policymakers need to encourage digitalization by paying attention to the four dimensions that determine system sustainability	Relevant as a reference dimension of SIM quality which includes system quality and information quality
4	(Santoso et al., 2022)	<i>Management Information Systems: Bibliometric Analysis and Its Effect on Decision Making</i>	The effect of SIM on the effectiveness of administrative decision-making	120 administrative employees in Bandung	Exploratory survey, simple regression	Driver's license has a positive and significant effect on the effectiveness of decision-making; SIM quality is in the high category	Organizations need to continue to improve the quality of driver's licenses to support more effective and efficient decision-making	Relevant as empirical evidence of the influence of SIM quality on the efficiency of managerial processes
5	(Al-Qaeda &	<i>Impact of Informa</i>	The effect of informa	333 college student	Quantitative, SEM-	The quality of informati	Platfor m develop	Relevant as a reference

	Alduai j, 2024)	<i>tion Quality on Satisfaction with E-Learning Platforms: Moderating Role of Instructor and Learner Quality</i>	tion quality on user satisfaction of e-learning platforms	s in SMART Kuwait PLS	on has a significant positive effect on user satisfaction; The effect of moderation of the quality of instructors and learners is not significant	ers need to prioritize improving the quality of information as a determinant of user satisfaction	dimension of information quality in the DeLone-McLean IS Success Model	
6	(Qin et al., 2022)	<i>The Addiction Behavior of Short-Form Video App TikTok: The Information Quality and System Quality Perspective</i>	The influence of system quality and information quality on addictive behavior through flow experience	659 Chinese adolescents aged 10–19	Quantitative, PLS	System quality has a stronger effect on the flow of experience than the quality of information; concentration is the most important factor in forming addiction	App developers need to design usage restrictions on mechanisms; Parents need to be actively involved in supervision	Relevant as a theoretical foundation for constructing system quality and information quality in the IS model
7	(Li & Zhu, 2022)	<i>System Quality, Information Quality, Satisfaction and Acceptance of Online Learning Platforms Among</i>	Factors that affect student acceptance and satisfaction with online learning platforms	College students in China	Quantitative, USATA model	Platform quality and information quality affect user satisfaction; satisfaction affects intent of use; greater	Platform developers need to improve the quality of systems and information sources to	Relevant as a reference model for measuring system quality and information quality simultaneously

		<i>College Students</i>				influence in online learning scenarios	increase user acceptance	
8	(J. C. Manurung, 2022)	<i>Antecedent of Risk-Based Capital of Public Non-Life Insurance Companies in Indonesia</i>	Macro and micro factors that affect the RBC ratio of Indonesian general insurers	9 public general insurance companies in Indonesia (2008–2019)	Quantitative, regression panel data	<i>Loss ratio</i> , total assets, and GDP are significant antecedents of RBC; total assets have a strong positive impact, moderate negative GDP	Management needs to strengthen its asset base and reduce <i>the loss ratio</i> to maintain a healthy RBC ratio	It is very relevant as a direct reference to RBC variables and their determining factors in the context of Indonesian insurance
9	(Tang et al., 2023)	<i>IoT-Based Information System on Cold-Chain Logistics Service Quality (ICCLSQ) Management in Logistics 4.0</i>	The impact of IoT technology on the quality management of cold chain logistics services	522 buyers of <i>fresh e-commerce products</i>	Quantitative, SEM, linear regression	The ease of use of IoT is the most important attribute for customer satisfaction; security and privacy affect 45% of IoT ease of use	Logistics managers need to optimize quality-based IoT systems to improve customer satisfaction and loyalty	Indirectly relevant as a reference for the quality of technology-based information systems on operational performance
10	(Elsayidh et al., 2022)	<i>Exploring the Determinants of Carbon Management System Quality</i>	The influence of board governance and climate risk on the	1,035 company-year observations in the UK (2011–2018)	Quantitative, panel data	Internal governance has a significant effect on the quality of carbon management	Companies with strong governance and high risk awareness are	Relevant as a reference for the influence of governance on the quality of

		<i>The Role of Corporate Governance and Climate Risks</i>	quality of carbon management systems			ent systems; Carbon risks and opportunities drive the adoption of high-quality management systems	more proactive in implementing quality management systems	the management system in the context of risk control
1 1	(Astuty et al., 2022)	<i>Does Enterprise Resource Planning Lead to the Quality of the Management Accounting Information System?</i>	The Role of ERP on the Quality of Management Accounting Information Systems (MAIS)	State-owned companies in Indonesia (180 respondents)	Quantitative, PLS	ERP has a positive effect on the reliability, efficiency, and flexibility of MAIS; Third, the hypothesis is empirically supported	SOEs in Indonesia need to strengthen the implementation of ERP to improve the quality of MAIS and support decision-making	Relevant as empirical evidence that the quality of information systems improves organizational operational efficiency
1 2	(Park, 2022)	<i>An Approach for Variable Selection and Prediction Model for Estimating the Risk-Based Capital (RBC) Based on Machine Learning</i>	Identify important predictors of RBC ratio using machine learning algorithms	23 Korean life insurance companies (2008–2018, quarterly)	<i>Machine Learning</i> (Random Forest and BRNN)	29 important predictors were found from 1,891 variables; the combination of Random Forest and BRNN is more accurate than OLS; Liability,	Stakeholders can leverage ML-based predictive models for monitoring insurance financial stability	It is very relevant as a reference for the variables that determine the RBC ratio and its prediction approach

		<i>g</i> <i>Algorithms</i>				expenses, and business performance are the main predictor categories		
1 3	(Getachew et al., 2022)	<i>Data Quality and Associated Factors in the Health Management Information System at Health Centers in Shashogo District</i>	Data quality and factors that affect it in health management information systems	300 health workers in Shashogo District, Ethiopia	<i>Cross-sectional, questionnaire</i>	HMIS data quality reaches 83%; accuracy 79%, completeness 86%, punctuality 84%; Supportive supervision and accuracy checking are key determining factors	Stakeholders need to improve data supervision and verification to achieve national quality standards of 90%	Relevant as a reference for the dimension of data quality in management information systems that have an impact on decision-making
1 4	(Saygin, 2023)	<i>Soil Quality Assessment Based on Hybrid Computational Approach with Spatial Multi-Criteria Analysis and GIS for Sustainable Tea</i>	Assessment of soil quality index for sustainable tea cultivation	Micro-catchment land in Rize Province, Turkey (102 samples)	Multi-criteria spatial analysis, GIS, geostatistics	More than 55% of the area has high soil quality; About 34% of the area is of low quality in the northern and northwestern parts	Farmers in low-quality soil areas need to implement biophysical measures such as calcification and fertilization	Less directly relevant; Relevant as a reference for the multidimensional index-based quality assessment methodology

<i>Cultivation</i>								
15	(Elkhaliki et al., 2023)	<i>Study of the Quality Index of Groundwater (GWQI) and its Use for Irrigation Purposes Using GIS of the Plain Nekor-Ghiss (Morocco)</i>	Groundwater quality assessment for irrigation and consumption purpose using GIS	79 groundwater samples from the Nekor-Ghiss plain, Morocco	Chemical analysis, GIS, GWQI index	Groundwater quality is generally poor to good enough for drinking; the majority are suitable for irrigation based on SAR and Na% parameters	Farmers and residents need to manage water sources sustainably with appropriate protective measures	Irrelevant directly; can be used as a reference for multi-parameter-based quality index measurement methodology
16	(Azizah & Lailiyah, 2024)	<i>Implementation of Management Information Systems in Supporting Administrative Services</i>	Implementation of SIM in improving administrative efficiency in Islamic educational institutions	MA Miftahul Ulum Cermenan Ngoro Jombang	Descriptive qualitative, interview and observations	SIM improves the integration of technology in education management and operational efficiency; IT infrastructure and HR capacity challenges still need to be addressed	Islamic educational institutions need to strengthen IT infrastructure and human resource development to optimize SIM implementation	Relevant as empirical evidence of the impact of SIM implementation on organizational operational efficiency
17	(H. Lubis & ...)	<i>The Effectiveness of the</i>	The effectiveness of SIM	SMPS Galih Agung Deli	Qualitative, descriptive,	The implementation of SIM	Training and task redistribution	Relevant as a reference the

	Aulia, 2024)	Implementation of Management Information Systems at Galih Agung Deli Serdang Junior High School in Improving the Quality of Education	implementation improving the quality of education	Serdang	case studies	improves information accessibility, administrative efficiency, and the quality of learning planning; Challenges in resource management still exist	butions have been proven to improve staff satisfaction and performance in SIM implementation	relationships between the quality of SIM implementation and organizational operational efficiency
18	(Uzair, 2023)	Application of Management Information System (SIM) in Improving the Quality of the Administration System for Services in Hospitals	The impact of SIM on the quality of hospital administration and services	Hospitals in Indonesia	<i>Literature review</i>	SIM improves operational efficiency, data accuracy, interdepartmental coordination, and overall quality of patient care	Hospitals need to optimize the implementation of driver's licenses to accelerate access to information and improve service quality	Relevant as a reference for the impact of SIM on operational efficiency in the service sector
19	(Sigalinggiet al., 2024)	The Role of Management Accounting in Improving Company	The contribution of management accounting to improving	Companies in Indonesia	<i>Literature analysis, case studies, interviews</i>	Management accounting contributes significantly to improved	Companies are advised to manage accounting a core	Relevant as a reference mechanism for improving operational

		y Operati onal Efficienc y	operatio nal efficienc y			decision- making, budget planning, and operation al supervisi on; helps reduce resource wastage	strategy to achieve competi tive advanta ge	efficiency through manageri al informati on systems
2 0	(Novit a, 2024)	Applicat ion of <i>Artificial Intellige nce</i> (AI) to Improve Operati onal Efficienc y in Manufac turing Compan ies: A Case Study of PT. XYZ	The impact of AI implem entation on the operatio nal efficienc y of manufac turing compan ies	PT. XYZ, an Indone sian manufa cturing compa ny	Qualita tive, case studies	AI improves productiv ity, product quality, and supply chain managem ent; challenge s in the form of limited skilled human resources and high impleme ntation costs	Compan ies need to invest in HR training and AI implem entation cost- efficienc y strategi es	Relevant as a reference for the role of informati on technolo gy in driving organizat ional operational efficiency
2 1	(D. W. Lubis, 2024)	The Influenc e of Personn el Managem ent Informa tion Systems on the Quality of Personn el Adminis tration	The impact of SIMPEG on the quality of personn el adminis tration services	Various organiz ations in Indone sia	<i>System atic review</i> , Google Scholar and PubMed	SIMPEG significan tly improves administr ative process efficiency , data accuracy, transpare ncy, and decision- making quality	The successf ul implem entation of SIM depends on technol ogical readine ss, training, and manage ment support	It is very relevant as a reference for the direct influence of SIM quality on the operational efficiency of the organizat ion

Services : <i>Systematic Review</i>								
22	(Shirley & Hughes, 2024)	Strategy to Improve MSME Operational Efficiency in the Digital Era: Qualitative Approach with <i>Business Intelligence</i> in <i>E-Commerce Implementation</i>	Strategy to increase MSME operational efficiency through <i>Business Intelligence</i> and <i>e-commerce</i>	MSMEs in Indonesia	Qualitative, literature analysis	BI improves business performance, decision-making, and the competitiveness of MSMEs; obstacles in the form of infrastructure limitation and technological understanding	The government and educational institutions need to support MSMEs in the adoption of information technology for operational efficiency	Relevant as a reference for the role of information technology in improving the operational efficiency of business entities
23	(Nur et al., 2022)	Application of Hospital Management Information System (SIMRS) Using the HOT-FIT Method: <i>Systematic Review</i>	Evaluation of the implementation of SIMRS using the HOT-FIT method	Hospitals in Indonesia	<i>Systematic review</i>	Human, organizational, and technological factors simultaneously affect the success of SIMRS; System and information quality are key components of technology	Hospitals need to improve training, infrastructure, and system evaluation to optimize SIMRS implementation	Relevant as a reference for the quality dimension of management information systems in the context of service services
24	(Sari, 2023)	The Effect of System	The three-dimensional	User of SIMRS RS	Quantitative, multiple	System quality, information	Hospitals need to	Highly relevant as a

		Quality, Information System "X"	onal effect of SIM quality on user satisfaction	"X" Palopo City	e linear regression	on quality, and service quality have a positive and significant effect on the satisfaction of SIMRS users	maintain and improve all three dimensions of SIM quality according to <i>the DeLone-McLean Model</i>	three-dimensional operationalization of SIM quality
25	(Subaida & Sandy, 2025)	<i>Risk Based Capital (RBC)</i> as an Indicator of the Financial Health of Insurance Companies Listed on the IDX for the 2022–2024 Period	Insurance companies' financial health assessment based on RBC ratio	Insurance companies listed on the IDX (2022–2024)	Quantitative descriptive, annual financial statements	Most companies have an RBC above 120%; some companies such as TUGU and ASBI were briefly below par but showed significant recovery	Insurance management needs to strengthen its capital structure and risk management to keep RBC above regulatory thresholds	It is very relevant as a direct empirical reference for the measurement and dynamics of the RBC ratio in the Indonesian insurance industry
26	(Staniyah, 2022)	<i>Risk Based Capital Analysis</i> to Assess the Financial Performance of	Assessment of the financial performance of insurance companies	10 insurance companies listed on the IDX (2016–2020)	Quantitative descriptive, RBC analysis	All companies meet the RBC minimum limit of 120%; PT Victoria Insurance Tbk has the	Insurance companies need to manage <i>underwriting</i> and investment risk	Highly relevant as a reference for the financial performance analysis of RBC-based

		Insurance Companies on the IDX for the 2016-2020 Period	through RBC analysis			highest RBC (815%) and PT Asuransi Bintang Tbk the lowest (137.6%); RBC is volatile	prudently to maintain RBC stability	insurance in Indonesia
27	(Pratiwi, 2022)	Application of Financial Management Information System in Village Governments in Bangsal sari District, Jember Regency	The effect of system quality and information quality on the satisfaction of SIMDA Financial users	Village apparatus in Bangsal sari District, Jember	Quantitative, saturated sample	The quality of the system has no significant effect on user satisfaction; Information quality has a positive and significant effect on user satisfaction	Village governments need to improve the quality of information generated by financial driver's licenses to support user satisfaction and compliance	Relevant as a reference the influence of the SIM quality dimension on the effectiveness of system use
28	(Fauzi ah & Mulyanti, 2023)	Factors Affecting the Quality of Human Resources for Hospital Management Information Systems (SIMRS): <i>Systema</i>	HR quality factors that affect the quality of SIMRS	Hospitals in Indonesia (6 articles selected from 792)	<i>Systematic literature review</i> , PubMed, Google Scholar, ProQuest	Education, knowledge, skills, professionalism, technology, and quality of health services are the main factors in the quality of human	Hospitals need to invest in comprehensive human resource development to improve the quality of SIMRS	Relevant as a reference for HR capability factors in supporting the quality of SIM implementation

		<i>tic Literatu re Review</i>				resources that affect SIMRS			
2 9	(Salsa bila, 2024)	The Influenc e of Tax Plannin g, Liquidit y, Solvenc y, and <i>Risk Based Capital</i> on Financia l Perform ance	The influenc e of RBC and other financial variable s on the financial perform ance of insuran ce compan ies	13 general insuran ce compa nies on the IDX (2019- 2022)	Quanti tative causali ty, multipl e linear regress ion	Tax planning and RBC have a positive effect on financial performa nce (ROA); liquidity and solvency have no significan t effect	Compan ies with high RBCs reflect strong financia l health, a positive image, and increase d premi um earnings	It is particula rly relevant as empirical evidence of a positive relations hip between the RBC ratio and the financial performa nce of insuranc e companie s	
3 0	(Rizqi, 2025)	Effectiv e Strategi es to Improve Compan y Operati onal Efficienc y	Identify key strategi es for improvi ng the compan y's operatio nal efficienc y	Compa nies in Indone sia	Literat ure review	Process automati on, resource managem ent, KPI monitori ng, and employee training are the four main strategies ; Integrate d approach es have proven to be most effective	Compan ies need to integrat e all four strategi es adaptiv ely to achieve sustaina ble operatio nal efficienc ies	Relevant as a reference for strategies to increase operation al efficiency that have an impact on strengthe ning financial performa nce	

## Discussion

### A. The Effect of Management Information System Quality on the Operational Efficiency of Insurance Companies in Indonesia

The quality of Management Information Systems (SIM) has proven to be a strategic determinant that substantially drives increased operational efficiency in various types of organizations, including insurance companies. SIM capabilities that include the dimensions of system quality, information quality, and service quality allow organizations to automate administrative processes, speed up workflows, and minimize redundancy of operational activities that have the potential to unproductively strain the company's resources (Al-Qaeda & Alduaij, 2024). In the context of Indonesian insurance companies, the implementation of a high-quality driver's license facilitates the integration of premium, claim, and investment data in a systematic manner. *real-time*, so managers can make faster and more accurate operational decisions without having to rely on error-prone manual processes (Anggraini & Kuntadi, 2023).

Empirical evidence from various studies corroborates the positive relationship between SIM quality and operational efficiency. Application *Enterprise Resource Planning* (ERP) as a concrete form of SIM has been proven to increase the reliability, efficiency, and flexibility of management accounting information systems in state-owned companies in Indonesia, which directly impacts the optimization of the use of organizational resources (Fauziah & Mulyanti, 2023). In line with these findings, the adoption of artificial intelligence-based technologies and *Business Intelligence* in information systems has also been proven to encourage increased productivity and more efficient management of the operational process chain, as evidenced in the context of manufacturing companies and MSMEs in Indonesia (Eduar et al., 2023).

The dimension of information quality produced by SIM has a very crucial role in supporting operational efficiency. Accurate, timely, and relevant information allows insurance company management to allocate resources proportionately, identify inefficiencies in each operational line, and respond to changes in market conditions more adaptively (Santoso et al., 2022). Top management support and system user competencies have also proven to be significant predictors that strengthen SIM quality, so organizations that have both factors tend to achieve a more optimal level of operational efficiency (Nurhayati et al., 2023). Thus, investment in improving the quality of driver's licenses in Indonesian insurance companies is not just a technological necessity, but a strategic step that has a direct impact on saving operational costs and increasing overall productivity (Elsayih et al., 2022).

#### **B. The Effect of Operational Efficiency on the Risk-Based Capital (RBC) Ratio of Insurance Companies in Indonesia**

Operational efficiency is a key variable that structurally determines the strength of an insurance company's capital position as reflected in the ratio *Risk-Based Capital* (RBC) (Ghofar et al., 2025). Insurance companies that are able to significantly reduce operating expenses will have a larger revenue surplus to allocate as additional capital, so the RBC ratio, which is the ratio of available capital to the minimum solvency threshold, will experience a consistent and measurable increase (Saygin, 2023). This condition is in line with the empirical reality that insurers with an efficient cost structure tend to maintain RBC ratios well above the minimum threshold of 120% set by the OJK (Subaida & Sandy, 2025).

Previous research confirms that micro-factors related to operational management efficiency, such as *loss ratio* and total assets, which are a significant antecedent of the RBC ratio of general insurers in Indonesia (Sigalingging et al., 2024). *Loss ratio* The low reflects the company's ability to manage claims efficiently, which in turn reduces pressure on capital positions and strengthens risk-based solvency ratios. In addition, companies with high RBC values are proven to have a more positive financial image in the eyes of the

public, so the acquisition of increased premiums will further encourage capital accumulation that strengthens the solvency position on a sustainable basis (Staniyah, 2022).

The transmission mechanism of operational efficiency to the RBC ratio can also be understood through the perspective of management accounting, where effective cost control practices help companies optimize resource allocation and reduce unnecessary waste (Shirley & Hughes, 2024). Integrated efficiency improvement strategy, including process automation, performance-based monitoring *Key Performance Indicators* (KPIs), and disciplined resource management, have been shown to produce a more sustainable impact on an organization's financial performance than an uncoordinated partial approach (Tang et al., 2023). Therefore, strengthening operational efficiency in Indonesian insurance companies should be seen as a prudential instrument that directly contributes to the long-term solvency resilience of companies.

### **C. The Role of Operational Efficiency Mediation in the Relationship between SIM Quality and RBC Ratio of Insurance Companies in Indonesia**

The relationship between SIM quality and RBC ratio is not entirely straightforward, but rather works significantly through an operational efficiency mediation pathway that connects the two variables in a cohesive causality chain. The high quality of the SIM first drives increased operational efficiency through process automation, information accuracy, and accelerated decision-making, which then cumulatively contributes to the strengthening of the capital position and the improvement of the insurance company's RBC ratio. This pattern of mediation is consistent with the premise of the theory *Resource-Based View* (RBV) which states that information technology capabilities can only produce sustainable financial advantages if they succeed in optimizing the organization's internal processes first ((Elkhalki et al., 2023). The empirical evidence supporting this mediation pattern can be traced from some of the findings of previous research. Quality information systems have been proven to improve coordination between departments, speed up the completion of administrative processes, and produce more accurate financial information, all of which contribute to the suppression of unnecessary operational costs (Azizah & Lailiyah, 2024). This cost suppression ultimately increases the capital surplus that the company can use to strengthen its capital base in meeting the RBC requirements set by the regulator. In addition, insurance companies that implement high-quality driver's licenses also have better risk prediction capabilities, so they can allocate capital reserves more precisely and efficiently (J. C. Manurung, 2022).

The implications of these findings suggest that investments in improving the quality of driver's licenses in Indonesian insurers need to be strategically directed to ensure that their impact on operational efficiency can be optimally realized. The quality of the system that includes reliability, flexibility, and ease of use must go hand in hand with the improvement of the quality of the information produced, so that management has a strong foundation in formulating efficient operational policies (Astuty et al., 2022). Thus, operational efficiency born from superior SIM quality will be a strategic bridge that consistently raises the RBC ratio of Indonesian insurance companies towards a stronger and more sustainable solvency condition (Attar et al., 2025).

## **4. CONCLUSION**

Based on the results of this study, it is emphasized that the quality of the Management Information System has a significant positive effect on the operational efficiency of Indonesian insurance companies through process optimization, data

accuracy, and acceleration of managerial decision-making. The operational efficiency that was built then proved to be the main driver of strengthening the *Risk-Based Capital* ratio through the accumulation of capital surplus resulting from the suppression of unproductive cost burdens. Overall, operational efficiency mediates the relationship between SIM quality and RBC ratios, so quality information technology investment is a strategic prudential instrument for the long-term solvency resilience of insurance companies in Indonesia.

## 5. BIBLIOGRAPHY

- Alterkait, M. A., & Alduaij, M. Y. (2024). *Impact of Information Quality on Satisfaction with E-Learning Platforms : Moderating Role of Instructor and Learner Quality*. March, 1–13. <https://doi.org/10.1177/21582440241233400>
- Anggraini, N. S., & Kuntadi, C. (2023). *The Influence of Information Technology, Internal Control and User Competence on the Quality of Accounting Information Systems*.
- Astuty, W., Pratama, I., Basir, I., & Harahap, J. P. R. (2022). *Does Enterprise Resource Planning Lead To The Quality Of The Management Accounting Information System?* 25(2), 93–107. <https://doi.org/10.17512/pjms.2022.25.2.06>
- At- tamimi, R. M. R., & Siregar, T. E. (2022). *Measurement of Successful Implementation of Institution Level Financial Application System ( SAKTI ) Web Full Module with DeLone and McLean Information System Success Model Approach. Consider using the three paragraphs beginning with, "Consider using the three paragraphs beginning with, 'Consider using the three paragraphs beginning with, 'Consider using the three paragraphs beginning with, 'Consider using the three paragraphs beginning with, 'Consider using*
- Atobishi, T., Moh, S., & Nosratabadi, S. (2024). *How Do Digital Capabilities Affect Organizational Performance in the Public Sector? The Mediating Role of the Organizational Agility Thabit*.
- Attar, H., Alibraheem, M. H., Alsaqoor, S., & Alsaleem, E. (2025). *System quality , information quality , perceived usefulness , and ease of use as determinants of intention to continue using a Digital Accounting System among Jordanian SMEs*. 17(2), 78–89. <https://doi.org/10.2478/emj-2025-0013>
- Azizah, M., & Lailiyah, N. (2024). *Implementation of management information systems in supporting administrative services. Also Read: 2, 80–94*.
- Bianchi, I. S. (2022). *Information Technology Governance for Higher Education Institutions: A Multi-Country Study*. 1–28.
- Capasso, A. (2024). *Digital health and the promise of equity in maternity care : A mixed methods multi-country assessment on the use of information and communication technologies in healthcare facilities in Latin America and the Caribbean*. 1–20. <https://doi.org/10.1371/journal.pone.0298902>
- Dillianti, R. (2025). *From readiness to excellence : The role of digital enablement and innovation in life insurance performance*. [https://doi.org/10.21511/ins.15\(2\).2024.04](https://doi.org/10.21511/ins.15(2).2024.04)
- Eduar, D., Saputra, E., Rahma, V. M., & Id, A. E. (2023). *Do system quality and information quality affect job performance? The mediation role of users' perceptions*. 1–16. <https://doi.org/10.1371/journal.pone.0285293>
- Elkhalki, S., Hamed, R., Jodeh, S., Ghalit, M., & Elbarghmi, R. (2023). *Study of the quality index of groundwater ( GWQI ) and its use for irrigation purposes using the*

- techniques of the geographic information system ( GIS ) of the plain Nekor-Ghiss ( Morocco ). May, 1–12. <https://doi.org/10.3389/fenvs.2023.1179283>*
- Elsayih, J., Datt, R., Tang, Q., Hamid, A., & Spirit, M. E. (2022). *Exploring the determinants of carbon management system quality : The role of corporate governance and climate risks and opportunities.* 4065–4091. <https://doi.org/10.1111/acfi.13086>
- Emeka, M. (2023). *Effect of Information Communication Technology (ICT) Investment on Financial Performance of listed Insurance Firms in Nigeria.*
- Erbara, A. (2022). *Systematic Literature Review: Implementation of Principles of Financial Administration in Indonesia.* 2(1), 1–10.
- Fadilah, A., & Timur, J. (2025). *The Influence of Risk Based Capital on Profitability in Sharia Life Insurance Companies.* 9(2), 258–286.
- Fauziah, S., & Mulyanti, D. (2023). *Factors Affecting the Quality of Human Resources for Hospital Management Information Systems (Simrs): Systematic Literature Review.* 2(1), 27–36.
- Getachew, N., Erkallo, B., & Garedew, M. G. (2022). Data quality and associated factors in the health management information system at health centers in Shashogo district, Hadiya zone, southern Ethiopia, 2021. *BMC Medical Informatics and Decision Making*, 3, 1–9. <https://doi.org/10.1186/s12911-022-01898-3>
- Ghofar, A., Kusumadewi, A. W., & Widiastutik, R. N. (2025). Does firm size strengthen the relationship between digital transformation and capital structure ? A case in ASEAN nations. *Cogent Business & Management*, 12(1). <https://doi.org/10.1080/23311975.2025.2570503>
- Ilkevich, S. V., Listopad, E. Y., Malinovskaya, N. V., Rostovtseva, P. P., Drobysheva, N. N., & Borisov, A. V. (2022). *Financial Risk and Profitability Management in Russian Insurance Companies in the Context of Digitalization.*
- Khoiriyah, I. (2022). *The Effect of Premium Income, Investment Return, and Risk Based Capital on Corporate Profitability (Study on Insurance Companies Listed on the Indonesia Stock Exchange for the 2018-2020 Period).* 5(10), 669–686.
- Lanfranchi, D., & Grassi, L. (2021). Translating technological innovation into efficiency : the case of US public P&C insurance companies. *Eurasian Business Review*, 11(4), 565–585. <https://doi.org/10.1007/s40821-021-00189-7>
- Li, X., & Zhu, W. (2022). *System quality , information quality , satisfaction and acceptance of online learning platform among college students in the context of online learning and blended learning.* December, 1–15. <https://doi.org/10.3389/fpsyg.2022.1054691>
- Lubis, D. W. (2024). *The Influence of Personnel Management Information System on the Quality of Personnel Administration Services: Systematic Review.* 5, 135–141.
- Lubis, H., & Aulia, T. Y. (2024). *The Effectiveness of the Implementation of Management Information Systems at SMPS Galih Agung Deli Serdang in Improving the Quality of Education.* 15(1), 87–98.
- Manurung, J. C. (2022). *Antecedent of risk-based capital of public non-life insurance companies in Indonesia.* 26(2), 99–110.
- Manurung, T. and A. P. A. K. : S. S. L. R. T. 2010-2025Amran, Sangapan, L. H., Paryanti, A. B., & Haymans, A. (2025). *Trends and Directions of Financial Accounting Research: A Systematic Literature Review 2010-2025.* 3(1), 12–24.
- Ming, Q., Hui, L., Lee, S., & Mun, W. (2023). Efficiency , productivity and competitiveness of the Malaysian insurance sector : an analysis of risk - based capital regulation.

- The Geneva Papers on Risk and Insurance - Issues and Practice*, 0123456789. <https://doi.org/10.1057/s41288-020-00173-8>
- Nasution, H., Muafi, M., El-qadri, Z. M., & Suprihanto, J. (2025). *Impact of digital business transformation on organizational ambidexterity and performance in Indonesian insurance firms*. 21(1), 1–20.
- Novita, Y. (2024). *Application of Artificial Intelligence (AI) to Improve Operational Efficiency in Manufacturing Companies: A Case Study of PT. XYZ*. 1(1), 11–21.
- Nur, S., Septiyani, D., Sulistiadi, W., Masyarakat, K., Indonesia, U., & Info, A. (2022). *Application of Hospital Management Information System (Simrs) Using the Hot-Fit Method: Systematic Review*. *Sci*. 8(2), 136–147. <https://doi.org/10.35329/jkesmas.v8i2.3706>
- Nurhayati, N., Hartanto, R., Paramita, I., Sofianty, D., & Ali, Q. (2023). The predictors of the quality of accounting information system: Do big data analytics moderate this conventional linkage? *Journal of Open Innovation: Technology, Market, and Complexity*, 9(3), 100105. <https://doi.org/10.1016/j.joitmc.2023.100105>
- Park, J. (2022). *An approach for variable selection and prediction model for learning algorithms*.
- Paula, A., Vale, J., Leite, E., & Lis, M. (2024). International Journal of Accounting Linking quality of accounting information system and financial reporting to non-financial performance : The role women managers. *International Journal of Accounting Information Systems*, 54(December 2023), 100692. <https://doi.org/10.1016/j.accinf.2024.100692>
- Pratiwi, A. (2022). *Application of Financial Management Information System in Village Government in Bangsalsari District, Jember Regency. Consider using the three paragraphs beginning with, "Consider using the three paragraphs beginning with, 'Consider using the three paragraphs beginning with, 'Consider using the three*
- Qin, Y., Omar, B., Musetti, A., & Wang, Y. M. (2022). *The addiction behavior of short-form video app TikTok : The information quality and system quality perspective*. September. <https://doi.org/10.3389/fpsyg.2022.932805>
- Rizqi, I. (2025). *Effective Strategies to Improve Company Operational Efficiency* *Journal of Business Economics and Management*. pp. 1(03), 328–334.
- Salsabila, N. A. (2024). *The Influence of Tax Planning, Liquidity, Solvency and Risk Based Capital on Financial Performance*. *StuRat (talk) 01*:
- Santoso, B., Hikmawan, T., & Imaniyati, N. (2022). *Management Information Systems: Bibliometric Analysis and Its Effect on Decision Making*. 7, 583–602.
- Sari, N. (2023). *The Influence of System Quality, Information Quality and Service Quality on User Satisfaction of the Management Information System of the Palopo City Hospital "X" The Influence of System Quality, Information Quality and Service Quality on User Satisfaction of the Management* .
- Saygin, F. (2023). *Soil quality assessment based on hybrid computational approach with spatial multi- criteria analysis and geographical information system for sustainable tea cultivation*.
- Sigalingging, S. M., Hasan, I. A., Science, I., Politics, I., & Yapis, I. (2024). *The Role of Management Accounting in Improving Company Operational Efficiency. That is why we need to be vigilant*.
- Stanayah, M. (2022). *Risk Based Capital Analysis to Assess the Financial Performance of Insurance Companies on the IDX for the 2016-2020 Period*. 256–268.

- Subaida, I., & Sandy, R. G. (2025). *Risk Based Capital (RBC) as an indicator of the financial health of insurance companies listed on the IDX for the 2022-2024 period*. 4(11), 2799–2814.
- Sunarta, I. N. (2023). *Accounting Information System Quality And Organizational Performance: The Mediating Role Of Accounting Information Quality*. 1–20.
- Tang, Y. M., Yin, K., Wei, C., Kuo, T., & Xiao, X. (2023). *IoT - Based Information System on Cold - Chain Logistics Service Quality ( ICCLSQ ) Management in Logistics 4 . 0*. 0123456789.
- Uzair, I. (2023). *The application of the management information system (sim) in improving the quality of the administrative system for services in hospitals*. 1(4), 1254–1258.
- Valdés-Cuervo, A. A., Saura, J. R., & Chen, S. (2022). *Improving the Sustainable Usage Intention of Mobile Payments : Extended Unified Theory of Acceptance and Use of Technology Model Combined with the Information System Success Model and Initial Trust Model*. 12(January), 1–17. <https://doi.org/10.3389/fpsyg.2021.634911>
- Vollmer, M., Berchtold, C., & Anni, J. (2025). *International Journal of Disaster Risk Reduction Co-creating solutions for Disaster Risk Reduction in multi-country research projects – Opportunities and Challenges ☆*. 117(August 2024).
- Wiranata, I. P. B., & Hiu, S. (2024). *Strategy to Improve MSME Operational Efficiency in the Digital Era: A Qualitative Approach with Business Intelligence in E-Commerce Implementation*. 9(1), 23–32.