

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Terakreditasi SINTA Peringkat 2 SK: 148/M/KPT/2020

MATRIK
MATRIK

Social Media Engagement Effect on Brand Extension and Loyalty: Luxury and Non-Luxury Brands

Adinda Saraswati R, Rifelly Dewi Astuti

Implications Of Interpersonal Conflict for Physicians' Task Performance: Workplace Deviance as A Mediator

Andri Sulaksono, Burhan Bungin, Liliana Dewi, Alexander Hiro Wibisono, Andhein Syifa Tsabita

How Workload And Role Conflict Affect Employee Performance Through Burnout: A Mediation Analysis

Rd. Roro Anggraini Soemadi, Hendra Galuh Febrianto, Mikail Kartaloğlu, Amalia Indah Fitriana, Riski Ulan Sari

Cooperative And Financial Literacy on Cooperative Performance: The Mediating Role of Business Capability

Dede Djuniardi, Lili Karmela Fitriani, Neng Evi Kartika

Digitizing Strategy for Msmes in Banyumas with A Web-Based Pavlovian Conditioning Approach

Lina Fatimah Lishobrina, Diovianto Putra Rakhmadani, Maliana Puspa Arum, Ade Yanyan Ramdhani

The Competitiveness of National Solar Modules in The Residential Market: Perspective of EPC Companies

Dwi Nurma Heitasari, Ibnu Lukman Pratama, Qonita Hana Insyira

Ambidexterity And Perceived Organizational Support Predict Employee Performance: Roles of Dark Triad and Job Satisfaction

Raden Teja Yokanan, Mardin Nazara

Published by: Udayana University

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN	Volume 20	Number 1	Page 1-128	Denpasar February 2026	p-ISSN 1978-2853	e-ISSN 2302-8890
--	--------------	-------------	---------------	---------------------------	---------------------	---------------------



Published since 2007 by Udayana University

EDITORIAL TEAM

Editor in Chief

1. **Ni Nyoman Ayu Diantini**, Faculty of Economics and Business, Udayana University, Indonesia

Managing Editor

1. **Anak Agung Gede Agung Artha Kusuma**, Faculty of Economics and Business, Udayana University, Indonesia
2. **Ketut Juliartini**, Faculty of Economics and Business, Udayana University, Indonesia

Editorial Board Members

1. **Arnold Japutra**, University of Indonesia, Indonesia
2. **Evan Lau**, University Malaysia Sarawak, Malaysia
3. **Kadek Trisna Dwiyantri**, Murdoch University, Australia
4. **Manorajan Sahoo**, School of Humanities Kalinga Institute of Industrial Technology (KIIT) Demeed To Be University Bhubaneswar, India
5. **Muhammad Ashfaq**, IU University of Applied Sciences, Bad Honnef Germany
6. **Ardi Gunardi**, Pasundan Bandung University, Indonesia
7. **Yustinus Budi Hermanto**, Katolik Darma Cendika University, Indonesia
8. **I Gusti Bagus Wiksuana**, Udayana University, Indonesia
9. **Ni Nyoman Kerti Yasa**, Udayana University, Indonesia
10. **I Wayan Gede Supartha**, Udayana University, Indonesia
11. **I Gede Bayu Rahanatha**, Udayana University, Indonesia

Editorial Assistant

1. **Ni Putu Risky Suantari**, Faculty of Economics and Business, Udayana University, Indonesia
2. **Gilbert Maxwell Pasau Tandipayuk**, Faculty of Economics and Business, Udayana University, Indonesia
3. **Putu Ayu Purnama Sari**, Faculty of Economics and Business, Udayana University, Indonesia

EDITORIAL ADDRESS

BJ Building Lv. III, Faculty of Economics and Business, Udayana University

Jl. PB Sudirman, Denpasar

Tel. 0361-224133, Fax. 0361-241929

e-mail: matrik.fe@unud.ac.id



TABLE OF CONTENTS

Social Media Engagement Effect on Brand Extension and Loyalty: Luxury and Non-Luxury Brands Adinda Saraswati R, Rifelly Dewi Astuti _____	1-19
Implications Of Interpersonal Conflict for Physicians' Task Performance: Workplace Deviance as A Mediator Andri Sulaksono, Burhan Bungin, Liliana Dewi, Alexander Hiro Wibisono, Andhein Syifa Tsabita _____	20-40
How Workload and Role Conflict Affect Employee Performance Through Burnout: A Mediation Analysis Rd. Roro Anggraini Soemadi, Hendra Galuh Febrianto, Mikail Kartaloğlu, Amalia Indah Fitriana, Riski Ulan Sari _____	41-53
Cooperative And Financial Literacy On Cooperative Performance: The Mediating Role Of Business Capability Dede Djuniardi, Lili Karmela Fitriani, Neng Evi Kartika _____	54-72
Digitizing Strategy for Msmes in Banyumas with A Web-Based Pavlovian Conditioning Approach Lina Fatimah Lishobrina, Dioviando Putra Rakhmadani, Maliana Puspa Arum, Ade Yanyan Ramdhani _____	73-94
The Competitiveness of National Solar Modules in The Residential Market: Perspective Of EPC Companies Dwi Nurma Heitasari, Ibnu Lukman Pratama, Qonita Hana Insyira _____	95-110
Ambidexterity And Perceived Organizational Support Predict Employee Performance: Roles Of Dark Triad and Job Satisfaction Raden Teja Yokanan, Mardin Nazara _____	111-128



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 20 No. 1, 2026 (February), 1-19



SOCIAL MEDIA ENGAGEMENT EFFECT ON BRAND EXTENSION AND LOYALTY: LUXURY AND NON-LUXURY BRANDS



SINTA 2

Adinda Saraswati R¹⁾, Rifelly Dewi Astuti²⁾

^{1,2} Universitas Indonesia, Depok, Indonesia

Email: dindaramadhina@gmail.com

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p01>

ABSTRACT

This study examines the influence of Consumer Engagement (CE) on social media on Brand Extension (BExt) success and Brand Loyalty, comparing luxury and non-luxury brands in Indonesia. Addressing limited comparative evidence across these segments, a quantitative design was employed using survey data from 442 active social media users, including non-luxury brand consumers (n=215) and luxury brand consumers (n=227). Structural Equation Modeling (SEM) with SmartPLS assessed the effects of cognitive, affective, and activation dimensions of CE on attitudes toward brand extensions, extended brand loyalty, and parent brand loyalty. Results reveal significant segment differences: cognitive engagement drives extension attitudes for non-luxury brands, whereas affective engagement is more influential for luxury brands. Activation positively affects extension attitudes in both segments. Attitudes toward brand extensions significantly predict extended and parent brand loyalty. Multi-Group Analysis confirms contextual differences, offering theoretical contributions and practical implications for segment-specific social media strategies in competitive digital markets

Keywords: consumer engagement; brand extension; brand loyalty; luxury brands; non-luxury brands.

INTRODUCTION

Brand extension (BExt) remains one of the most widely adopted growth strategies, enabling firms to leverage existing brand equity to introduce new products while reducing perceived risk and accelerating market acceptance (Aaker & Keller, 1990). Through extension, firms capitalize on accumulated brand associations, credibility, and consumer trust, thereby enhancing the likelihood of success in new categories. However, the effectiveness of brand extension has become increasingly complex in contemporary digital environments, where consumer perceptions are no longer shaped solely by static brand meanings but are dynamically co-created through continuous interaction on social media platforms. In such contexts, extension success depends not only on equity transfer from the parent brand but also on relational mechanisms embedded in ongoing consumer-brand engagement (Gielens & Steenkamp, 2021; Yoo, 2024).

Social media has transformed brand-consumer relationships from one-way communication into interactive, participatory processes in which consumers actively consume, contribute, and create brand-related content. This shift has elevated consumer engagement (CE) as a central construct in marketing scholarship. CE is commonly

conceptualized as a multidimensional phenomenon encompassing cognitive engagement (focused attention and information processing), affective engagement (emotional connection and attachment), and activation or behavioral engagement (interactive participation and contribution) (Hollebeek et al., 2022; Lim et al., 2022). Prior research consistently demonstrates that engaged consumers exhibit stronger brand attitudes, higher loyalty, greater advocacy, and increased willingness to support brand extensions. Engagement therefore represents a critical relational mechanism through which brands can cultivate favorable evaluations and loyalty outcomes in digital ecosystems.

Despite extensive research on CE and its outcomes, the majority of existing studies examine engagement effects in isolation, focusing either on brand attitudes or loyalty without sufficiently accounting for how engagement translates into evaluations of brand extensions. Brand extension decisions involve a distinct evaluative process, as consumers must assess the perceived fit, credibility, and legitimacy of applying an existing brand to a new product domain. In digital contexts, these evaluations are increasingly influenced by social cues, peer interaction, and shared engagement experiences rather than by brand-controlled messaging alone. Consequently, understanding how different dimensions of CE shape attitudes toward brand extension (BExt) and subsequent loyalty outcomes represents an important yet underexplored research avenue.

More critically, the extant literature offers limited consensus regarding whether engagement mechanisms operate uniformly across different brand types. Luxury and non-luxury brands are characterized by fundamentally different value propositions, consumption motives, and relational dynamics. Luxury brands are traditionally associated with symbolic value, exclusivity, prestige, and identity expression, whereas non-luxury brands emphasize functional utility, accessibility, and value-for-money considerations (Ko et al., 2021). These structural differences suggest that consumers may engage with luxury and non-luxury brands in qualitatively distinct ways, particularly on social media platforms where identity signaling and community interaction are salient.

From a theoretical standpoint, these distinctions imply that the relative importance of cognitive, affective, and activation-based engagement may vary across market segments. Cognitive engagement, which involves information seeking and rational evaluation, may be more salient in non-luxury contexts where consumers seek justification for purchase decisions and assess functional benefits. In contrast, affective engagement, driven by emotional resonance, aspiration, and self-concept alignment, is likely to play a more dominant role in luxury brand contexts. Activation-based engagement, reflecting interactive behaviors such as commenting, sharing, and co-creation, may serve as a universal mechanism reinforcing relational bonds and legitimizing brand extensions across both segments. However, empirical evidence that explicitly tests these differential pathways remains scarce.

Although prior studies confirm that CE positively influences attitudes toward brand extensions and loyalty outcomes (Yoo, 2024), most adopt a single-category or single-brand perspective, thereby obscuring segment-specific dynamics. Comparative analyses that systematically contrast luxury and non-luxury brands within the same empirical framework are notably limited. As a result, existing knowledge provides insufficient guidance regarding whether engagement strategies should be standardized across brand types or tailored according to segment-specific consumer motivations. Addressing this gap is essential for refining engagement theory and for informing managerial decision-making in increasingly heterogeneous digital markets.

The relevance of this research gap is further amplified in emerging digital economies, where rapid technological adoption intersects with evolving consumption patterns. Much of the existing CE and brand extension literature is grounded in developed Western markets, potentially limiting its generalizability to contexts characterized by different cultural, economic, and social structures. Emerging markets present distinct conditions in which engagement mechanisms may operate differently, shaped by collectivist norms, social visibility, and aspirational consumption. Consequently, examining CE–BExt–loyalty relationships in such contexts can yield valuable theoretical extensions and practical insights. Indonesia offers a theoretically meaningful and practically relevant setting for addressing this gap. As one of Southeast Asia’s largest digital economies, Indonesia exhibits exceptionally high social media penetration and mobile-centric consumption behavior, amplifying the strategic importance of online engagement. At the same time, Indonesia represents an emerging market characterized by a rapidly expanding middle class alongside growing aspirational luxury consumption. This coexistence creates a natural environment in which utilitarian-driven engagement (more salient in non-luxury contexts) and symbolic, identity-driven engagement (more prominent in luxury segments) operate simultaneously within the same digital ecosystem.

Moreover, Indonesia’s collectivist sociocultural orientation fosters socially embedded consumption patterns, where peer endorsement, community interaction, and shared brand experiences play a critical role in shaping attitudes and loyalty formation. In such contexts, engagement is not merely an individual cognitive or emotional response but a socially reinforced process that can intensify loyalty spillover from brand extensions to parent brands. These structural, economic, and cultural characteristics position Indonesia as an ideal context for examining how engagement dimensions differentially influence brand extension evaluations and loyalty outcomes across market segments.

Building on these considerations, this study integrates consumer engagement theory with brand extension and loyalty frameworks to develop a comparative model that distinguishes between luxury and non-luxury brand contexts. Specifically, the study conceptualizes CE as a multidimensional construct comprising cognitive, affective, and activation dimensions, and examines how each dimension influences attitudes toward brand extension. In turn, attitudes toward BExt are posited to drive loyalty toward both the extended brand and the parent brand, with potential spillover effects between these loyalty constructs. By employing structural equation modeling with partial least squares (PLS-SEM) and multi-group analysis (MGA), the study systematically tests whether these relationships differ significantly between luxury and non-luxury brands.

This research makes several contributions to the literature. First, it advances engagement theory by disaggregating the effects of CE dimensions and demonstrating that their relative importance is contingent on brand type. Second, it enriches brand extension research by embedding extension evaluation within a relational, engagement-driven digital framework rather than treating it as a static equity transfer process. Third, it extends existing knowledge by providing empirical evidence from an emerging market context, thereby enhancing the external validity and contextual sensitivity of CE–BExt–loyalty models.

METHODS

This study employed a quantitative explanatory research design to examine the causal relationships among Consumer Engagement (CE), Attitudes Toward Brand Extension (BExt), Extended Brand Loyalty, and Parent Brand Loyalty within social media contexts. An explanatory approach was deemed appropriate because the primary objective of the study was to test theoretically grounded hypotheses concerning the direction and magnitude of relationships among latent constructs rather than to explore phenomena inductively (Hair et al., 2022).

The conceptual model extends prior engagement-based branding frameworks by incorporating a comparative perspective between luxury and non-luxury brand contexts. Specifically, this study builds upon Yoo (2024) by modeling Consumer Engagement as a multidimensional construct consisting of cognitive, affective, and activation dimensions, each hypothesized to influence consumer attitudes toward brand extension. These attitudes are, in turn, expected to shape loyalty toward both the extended brand and the parent brand. Furthermore, extended brand loyalty is posited to exert a spillover effect on parent brand loyalty, consistent with contemporary theories of brand relationship transfer (Cho et al., 2024). Importantly, the model explicitly incorporates Multi-Group Analysis (MGA) to examine whether the structural relationships differ significantly between luxury and non-luxury brands. This comparative perspective is theoretically justified by the distinct consumption logics underlying these brand categories. Luxury brands are typically driven by symbolic value, emotional attachment, and identity signaling, whereas non-luxury brands emphasize functional value, affordability, and utilitarian benefits (Ko et al., 2019; Kim & Ko, 2020). The proposed research model is illustrated in Figure 1.

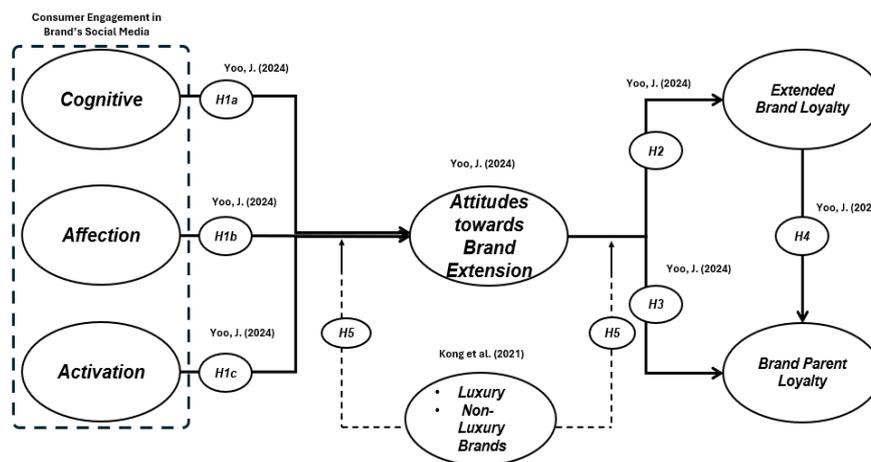


Figure 1. Proposed Research Model

Source: Authors, 2026

Based on the proposed framework, the study hypothesized that each dimension of Consumer Engagement cognitive, affective, and activation positively influences consumer attitudes toward Brand Extension. Subsequently, attitudes toward Brand Extension were hypothesized to positively influence both Extended Brand Loyalty and Parent Brand Loyalty. Extended Brand Loyalty was further hypothesized to positively influence Parent Brand Loyalty through a loyalty spillover mechanism. In addition, a key comparative hypothesis

proposed that the strength and significance of these relationships, particularly the indirect effects of CE dimensions on loyalty outcomes mediated by Brand Extension attitudes, would differ between luxury and non-luxury brand contexts. This hypothesis reflects the assumption that consumer motivations, evaluative criteria, and relational expectations vary systematically across brand types (Kong et al., 2021; Ko et al., 2019).

The target population comprised active Indonesian social media users aged 20 years or older who had interacted with or purchased from the selected case study brands within the preceding six months. Indonesia was selected as the empirical context due to its high social media penetration, rapid growth in digital consumption, and coexistence of both aspirational luxury consumption and mass-market non-luxury consumption within a single digital ecosystem. A purposive sampling technique was employed to ensure that respondents possessed sufficient familiarity with the focal brands and their brand extension activities. Purposive sampling is commonly used in consumer behavior research when the research objective requires respondents to meet specific experiential criteria. To qualify for participation, respondents were required to (1) actively use social media platforms, (2) follow or engage with at least one of the case study brands, and (3) have recent experience with the brand or its extension.

In line with guidelines for Structural Equation Modeling using Partial Least Squares (SEM-PLS), the final sample size exceeded the minimum requirements for model estimation and multi-group comparison. Data were successfully collected from 215 non-luxury brand consumers and 227 luxury brand consumers, yielding a total of 442 valid responses. This sample size is considered adequate for SEM-PLS analysis, particularly for models with multiple latent constructs and mediation pathways (Hair et al., 2022). The target population comprised active Indonesian social media users, aged 20 or older, who had recently interacted with or purchased from the specified case study brands within the last six months. A purposive sampling method was utilized to select respondents who met these predefined criteria. Adhering to guidelines for Structural Equation Modeling – Partial Least Squares (SEM-PLS). Data was successfully collected from 215 non-luxury brand consumers and 227 luxury brand consumers, totaling 442 valid respondents.

Primary data were collected using a structured online questionnaire, which was distributed through social media platforms and digital communication channels. An online survey was chosen due to its efficiency, accessibility, and suitability for capturing digitally active consumers, which aligns with the study's focus on social media engagement. All measurement items were assessed using a six-point Likert scale, ranging from 1 ("strongly disagree") to 6 ("strongly agree"). The use of an even-numbered scale was intentionally selected to promote response variability and reduce excessive reliance on neutral midpoint responses, which may obscure attitudinal differences (Douven, 2018). Prior research suggests that forced-choice Likert formats can mitigate central tendency bias and encourage more deliberate evaluative judgments, particularly in attitudinal research (Douven, 2018). Measurement items for Consumer Engagement (Cognitive, Affective, Activation dimensions), Attitudes Towards Brand Extension, Extended Brand Loyalty, and Parent Brand Loyalty were adapted from established literature (Hollebeek et al., 2019; Yoo, 2024; Yoo et al., 2021; Boisvert & Burton, 2020; Yoo & Park, 2020).

Before the main data collection, a rigorous multi-stage instrument validation procedure was conducted to ensure the clarity, reliability, and psychometric adequacy of the questionnaire. The first stage involved a wording test with seven expert respondents who had

academic and professional backgrounds in marketing, consumer behavior, and quantitative research methods. This step aimed to assess the clarity of item wording, the appropriateness of terminology, and the conceptual alignment of each indicator with its corresponding construct. Particular attention was given to ensuring that the items accurately reflected the dimensions of consumer engagement, brand extension attitudes, and brand loyalty within a social media context. Feedback from the experts was used to refine item phrasing, eliminate ambiguous wording, and enhance contextual relevance, thereby improving content validity.

Subsequently, a pre-test was conducted with 50 respondents who met the same criteria as the target population. The objective of this pre-test was to empirically evaluate the measurement instrument prior to full-scale data collection. Data obtained from the pre-test were analyzed using SPSS (version 27). Exploratory Factor Analysis (EFA) was employed to examine the underlying factor structure and to verify that the measurement items loaded appropriately on their intended constructs. EFA is commonly used at the preliminary stage of scale development to assess construct validity and to identify potential cross-loading items that may weaken measurement precision.

Several statistical criteria were applied to determine the adequacy of the data for factor analysis. The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was required to exceed 0.50, indicating that the sample was suitable for factor extraction. In addition, Bartlett’s Test of Sphericity was required to be statistically significant ($p \leq 0.05$), confirming that the correlation matrix was not an identity matrix and that meaningful relationships existed among the indicators. At the item level, the Measure of Sampling Adequacy (MSA) for each indicator was required to be greater than 0.50, ensuring that all items contributed adequately to the factor solution. Furthermore, factor loadings were evaluated using a conservative threshold of 0.70, indicating strong relationships between observed variables and their corresponding latent constructs. The internal consistency of each construct was assessed using Cronbach’s Alpha, with values greater than 0.70 considered indicative of satisfactory reliability. The results demonstrated that all constructs met the recommended reliability thresholds, suggesting that the measurement items consistently captured the underlying theoretical dimensions.

To address the potential risk of Common Method Bias (CMB) arising from the use of self-reported data collected through a single survey instrument, Harman’s Single Factor Test was performed. The analysis revealed that no single factor accounted for the majority of the variance, with the largest factor explaining less than 50% of the total variance. This result indicates that common method bias was unlikely to substantially influence the study’s findings (Jordan & Troth, 2019). Collectively, these validation procedures confirm that the measurement instrument possessed adequate validity and reliability, supporting its use in the subsequent Structural Equation Modeling analysis.

Structural Equation Modeling using the Partial Least Squares approach (SEM-PLS) was employed as the primary analytical technique in this study and implemented using SmartPLS software (version 4). SEM-PLS was selected due to its methodological suitability for analyzing complex research models involving multiple latent constructs and mediation paths, as well as its robustness when dealing with non-normal data distributions and moderate sample sizes. These characteristics align with established methodological recommendations in marketing and behavioral research, particularly for predictive and theory-development-oriented studies (Hair et al., 2022). Given the study’s objective to examine both direct and indirect relationships across different brand contexts, SEM-PLS provides an appropriate and flexible analytical framework. The data analysis followed a two-stage approach, comprising

the evaluation of the measurement model (outer model) and the structural model (inner model). This sequential procedure is consistent with best practices in SEM-PLS analysis, ensuring that the reliability and validity of the measurement instruments are established prior to interpreting structural relationships among latent constructs (Hair et al., 2022).

The evaluation of the measurement model focused on assessing convergent validity, internal consistency reliability, and discriminant validity. Convergent validity was examined by evaluating indicator outer loadings and the Average Variance Extracted (AVE). Indicator loadings were required to meet or exceed the threshold of 0.70, indicating that each item shared a substantial proportion of variance with its underlying construct. Additionally, AVE values were required to be greater than 0.50, confirming that each construct explained more than half of the variance of its indicators. These criteria ensure that the indicators adequately represent their respective latent constructs and are consistent with widely accepted SEM-PLS guidelines (Hair et al., 2022). Internal consistency reliability was assessed using both Composite Reliability (CR) and Cronbach's Alpha. Values equal to or greater than 0.70 for both measures were considered indicative of satisfactory reliability, suggesting that the indicators within each construct were consistently measuring the same underlying concept. The combined use of CR and Cronbach's Alpha provides a comprehensive assessment of construct reliability, particularly in SEM-PLS contexts where indicator loadings may differ (Hair et al., 2022). Discriminant validity was rigorously evaluated using multiple complementary criteria. First, the Fornell–Larcker criterion was applied, requiring that the square root of each construct's AVE exceed its correlations with other constructs in the model. Second, cross-loadings were examined to ensure that each indicator loaded more strongly on its intended construct than on any other construct. Third, the Heterotrait–Monotrait (HTMT) ratio of correlations was assessed, with values below the conservative threshold of 0.90 indicating adequate discriminant validity. The use of HTMT is particularly recommended for detecting potential discriminant validity issues that may not be identified through traditional methods alone (Hair et al., 2022). Together, these procedures provided strong evidence that the constructs were empirically distinct and conceptually well differentiated.

Following the establishment of a satisfactory measurement model, the structural model was evaluated to examine the hypothesized relationships among the latent constructs. The first step in assessing the structural model involved evaluating potential collinearity issues among predictor constructs. Variance Inflation Factor (VIF) values were examined, with values below 5 indicating that multicollinearity was not a concern and that the estimated path coefficients were stable and interpretable.

The explanatory power of the model was assessed using the Coefficient of Determination (R^2) for each endogenous construct. R^2 values indicate the proportion of variance explained by the model and provide insight into its predictive accuracy. Although acceptable R^2 values are context-dependent, the reported values were interpreted in line with established benchmarks for behavioral and marketing research (Hair et al., 2022). In addition, Predictive Relevance (Q^2) was evaluated using a blindfolding procedure. Q^2 values greater than zero indicate that the model has predictive relevance for the endogenous constructs, supporting the model's out-of-sample predictive capability.

To further assess the overall quality of the structural model, model fit indices were examined. Specifically, the Standardized Root Mean Square Residual (SRMR) was evaluated, with values below 0.08 indicating an acceptable model fit. In addition, the Normed Fit Index (NFI) was assessed, with values exceeding 0.80 considered indicative of adequate fit in SEM-PLS applications. These indices provide complementary information regarding the extent to

which the proposed model reproduces the observed covariance matrix (Al-Fraihat et al., 2020; Hair et al., 2022). Hypothesis testing was conducted using a bootstrapping procedure, which involved generating a large number of resamples to estimate the significance of path coefficients. The significance of direct and indirect effects was evaluated based on t-values greater than 1.96 and p-values less than 0.05, corresponding to a 95% confidence level. Bootstrapping is particularly well suited for SEM-PLS analysis, as it does not rely on distributional assumptions and provides robust estimates of standard errors and confidence intervals (Hair et al., 2022).

To address the study's comparative objective, Multi-Group Analysis (MGA) was employed to examine whether structural relationships differed significantly between the luxury and non-luxury brand groups. MGA allows for the systematic comparison of path coefficients and indirect effects across predefined groups, thereby providing insights into whether engagement mechanisms operate differently depending on brand context. By comparing both direct and mediated relationships across groups, the analysis offers a nuanced understanding of how consumer engagement translates into brand extension attitudes and loyalty outcomes in luxury versus non-luxury settings. Overall, the application of SEM-PLS combined with MGA provides a rigorous and comprehensive analytical approach that aligns with the study's theoretical objectives and empirical context. This methodological framework enables robust testing of complex mediation structures while capturing segment-specific differences, thereby strengthening the validity and interpretability of the study's findings.

RESULT AND DISCUSSION

Following data validation and screening, 442 valid responses were retained, comprising 215 respondents in the non-luxury group and 227 in the luxury group. The demographic profile indicates a young, educated, and urban-centered sample, with a strong concentration in the 26–40 age range and a predominance of respondents residing in Jabodetabek. This profile reflects digitally active, economically productive consumers who are more likely to engage with brands via social media platforms, consistent with prior research emphasizing the role of digitally immersed consumers in shaping engagement-driven brand outcomes (Hollebeek et al., 2022; Lim et al., 2022).

The demographic distribution also provides theoretical insight into the observed engagement–loyalty mechanisms. The higher concentration of luxury respondents in upper expenditure categories supports the notion that luxury consumption is closely tied to symbolic value and identity signaling (Ko et al., 2021). This aligns with findings suggesting that affective engagement tends to exert stronger influence in luxury contexts due to emotional attachment and prestige-driven motivations (Yoo, 2024). In contrast, the predominance of middle-expenditure consumers in the non-luxury group may explain stronger cognitive or activation-based engagement effects, as utilitarian evaluation and functional accessibility typically guide non-luxury consumption decisions. These findings converge with prior comparative studies demonstrating that consumer responses to social media marketing vary significantly between symbolic and functional brand contexts (Kong et al., 2021).

Moreover, the high educational attainment of respondents suggests greater information-processing capability, which may amplify the role of cognitive engagement in shaping brand extension attitudes. This observation extends prior engagement research by demonstrating that demographic characteristics—particularly education and income—may condition how engagement dimensions translate into loyalty spillover effects. While previous studies have established the positive influence of CE on brand attitudes and loyalty (Hollebeek

et al., 2022; Yoo, 2024), the present findings refine this understanding by highlighting segment-specific variations within a single emerging digital market.

Overall, the results suggest convergence with established engagement and brand extension theories in confirming the importance of multidimensional CE, while diverging in demonstrating that engagement pathways are contingent upon brand positioning and consumer socioeconomic characteristics. This reinforces the argument that engagement-based extension mechanisms are context-sensitive rather than universally uniform across market segments.

Table 1. Profile Respondent Information

Indicator		Non-Luxury		Luxury	
		N	%	N	%
Gender	Male	84	39%	106	47%
	Female	131	61%	121	53%
Age (years)	20–25	7	3%	12	5%
	26–30	106	49%	82	36%
	31–35	62	29%	42	19%
	36–40	32	15%	49	22%
	41–45	6	3%	39	17%
	>45	2	1%	3	1%
	Jabodetabek	179	83%	219	97%
Domicile	Java (non-Jabodetabek)	34	16%	1	4%
	Outside Java	2	1%	7	3%
	Bachelor/Diploma (S1/D3/D4)	152	71%	119	52%
Education Level	Master (S2)	55	26%	86	38%
	Doctoral (S3)	0	0%	3	1%
	Others	8	4%	19	8%
	Student	8	4/00%	9	4%
	Private Employee	102	47%	97	43%
Occupation	Public Servant / SOE	50	23%	15	7%
	Entrepreneur	45	21%	51	23%
	Housewife	5	2%	39	17%
	Freelancer	5	2%	11	5%
	Others	0	0%	5	2%
Monthly Expenditure	Low Monthly Expenditure	5	2%	8	4%
	Middle Monthly Expenditure	122	57%	101	44%
	High Monthly Expenditure	88	41%	118	52%

Source: Authors, 2025

All constructs demonstrated good convergent validity, with outer loadings consistently above 0,7 and Average Variance Extracted (AVE) values exceeding 0,5. Reliability was also established through Cronbach's Alpha and Composite Reliability values, all surpassing the 0,7 threshold, as shown in Table 2. Discriminant validity was rigorously confirmed using the Fornell-Larcker criterion. As for the discriminant reliability (Hair et al., 2022), all the variables are 0.7 or higher, as shown in Table 3.

Table 2. Reliability and Convergent Validity

Variabel/Dimension	Item	Non-Luxury				Luxury			
		Outer Loadings	AVE	Cronbach's Alpha	CR	Outer Loadings	AVE	Cronbach's Alpha	CR
Cognitive	CP1	0.872				0.820			
	CP2	0.886	0.738	0.822	0.894	0.767	0.655	0.738	0.851
	CP3	0.818				0.840			
Affection	AG1	0.879				0.734			
	AG2	0.852	0.678	0.843	0.894	0.787	0.595	0.758	0.847
	AG3	0.777				0.898			
	AG4	0.781				0.874			
Activation	ACT1	0.813				0.824			
	ACT2	0.875	0.702	0.787	0.876	0.910	0.776	0.856	0.912
	ACT3	0.823				0.905			
Attitudes Towards Brand Extension	ATT1	0.747				0.868			
	ATT2	0.814	0.645	0.740	0.845	0.844	0.665	0.744	0.855
	ATT3	0.845				0.728			
Extended Brand Loyalty	CL1	0.785				0.710			
	CL2	0.814	0.647	0.728	0.846	0.874	0.659	0.735	0.852
	CL3	0.814				0.841			
Brand Parent Loyalty	BL1	0.851				0.803			
	BL2	0.866	0.751	0.834	0.900	0.790	0.625	0.701	0.833
	BL3	0.882				0.778			

Source: Authors, 2025

Following the establishment of discriminant validity criteria, the analysis proceeded to an interpretation of descriptive statistics. Table 4 presents the descriptive mean differences, as determined by independent sample t-tests, between non-luxury and luxury brands. The results indicate that all dimensions exhibit a significant mean difference between the two brand types ($t\text{-stat} < t\text{-critical}$).

Table 3. Discriminant Validity

Dimensions	Non-Luxury						Luxury					
	1	2	3	4	5	6	1	2	3	4	5	6
Cognitive	0.859						0.810					
Affection	0.824						0.771					
Activation	0.838						0.881					
Attitudes Towards Brand Extension	0.803						0.815					
Extended Brand Loyalty	0.805						0.812					
Brand Parent Loyalty	0.867						0.791					

Source: Authors, 2025

Table 4. Descriptive Mean Difference T-Test

Indicator	Mean		T-test	
	Non-Luxury	Luxury	t-value	t-table
Cognitive	3.9054	3.5551	5.117	
Affection	3.3570	3.5165	3.694	
Activation	3.6295	2.5419	13.595	
Attitudes Towards Brand Extension	3.9008	3.4156	7.663	1.96
Extended Brand Loyalty	4.0202	3.3803	9.567	
Brand Parent Loyalty	4.0543	3.4743	8.806	

Source: Author, 2025

Descriptive analysis revealed that non-luxury brands (Saturdays) generally exhibit higher mean scores across all CE dimensions, BExt attitudes, and loyalty variables compared to luxury brands (Coach). Notably, Activation (X3) shows a significant difference, with non-luxury (mean=3.63) being substantially higher than luxury (mean=2.54), indicating more active engagement with non-luxury brands.

Table 5. Cohesion Determination

	R-square
Attitudes Towards Brand Extension (Z1)	0.41
Brand Parent Loyalty (Y)	0.47
Extended Brand Loyalty (Z2)	0.45

Source: Authors, 2025

The model yielded R² values of 0.41 for Attitudes Towards Brand Extension (Z1), 0.47 for Brand Parent Loyalty (Y), and 0.45 for Extended Brand Loyalty (Z2), indicating that the independent variables explained 41-47% of the variance in these constructs. While these R² values are often deemed modest by conventional benchmarks, their interpretation is contextual. As Hair et al. (2022) suggest, R² adequacy varies by model complexity and discipline. In intricate fields like consumer behavior and brand loyalty, numerous unobserved external factors naturally lead to lower explained variance. Despite this, the model successfully identified statistically significant relationships. Future research should consider incorporating additional relevant independent variables, moderators, or mediators to enhance predictive power and further enrich our understanding of these complex dynamics.

The subsequent analysis of direct and indirect effects, along with Multi-Group Analysis (MGA), revealed nuanced insights into how consumer engagement (CE) on social media influences brand extension (BExt) attitudes and brand loyalty across luxury and non-luxury contexts. The direct effects of the hypotheses are summarized in Table 6. In the full model, all direct hypotheses were supported, demonstrating significant positive effects. However, MGA revealed important nuanced differences between luxury and non-luxury brands.

Table 6. Hypothesis Direct Effect Testing Summary

Path	Complete Model			Non-Luxury			Luxury		
	β	t-value	p-value	β	t-value	p-value	β	t-value	p-value
H1a CP → ATT	0.283	5.686	0.000*	0.467	6.154	0.000*	0.104	1.446	0.149
H1b AG → ATT	0.189	3.877	0.000*	0.109	1.697	0.090	0.321	4.353	0.000*
H1c ACT → ATT	0.306	7.683	0.000*	0.215	2.768	0.006*	0.175	2.783	0.006*
H2 ATT → CL	0.674	27.603	0.000*	0.617	18.239	0.000*	0.651	15.711	0.000*
H3 ATT → BL	0.303	6.396	0.000*	0.335	6.695	0.000*	0.241	2.981	0.003*
H4 CL → BL	0.445	9.642	0.000*	0.543	10.688	0.000*	0.251	3.100	0.002*

Note: CP = Cognitive; AG = Affection; ACT = Action; ATT = Attitude Towards Brand Extension; CL = Extended Brand Loyalty; BL = Brand Parent Loyalty. *Means significance

Source: Authors, 2025

The direct influence of CE dimensions on Attitudes Towards Brand Extension (H1a, H1b, H1c) demonstrated significant variations. For H1a, which posited a positive influence of the Cognitive dimension of CE on attitudes towards BExt, the overall model showed strong support ($\beta = 0,283$, $p = 0,000$). However, MGA indicated a significant difference between groups ($p = 0,002$). Specifically, Cognitive CE strongly influenced attitudes towards BExt for non-luxury brands ($\beta = 0,467$, $p = 0,000$), but this influence was not significant for luxury brands ($\beta = 0,104$, $p = 0,149$). This finding highlights a fundamental difference in consumer processing: non-luxury consumers, who are often more value-conscious, rely more on rational information processing (Aaker, 1991) from social media to form opinions about BExt. Descriptive statistics showed non-luxury brands had generally higher mean cognitive engagement (3,91) compared to luxury (3,55). For luxury brands, where purchasing decisions are often driven by symbolic and emotional values, cognitive information appears less critical in shaping BExt attitudes (Ko et al., 2019).

Conversely, for H1b, which proposed that the Affective dimension of CE positively influences attitudes towards BExt, the overall model was also supported ($\beta = 0,189$, $p = 0,000$). MGA again revealed a significant difference ($p = 0,035$). Here, Affective CE had a significant positive influence on attitudes towards BExt for luxury brands ($\beta = 0,321$, $p = 0,000$), but not for non-luxury brands ($\beta = 0,109$, $p = 0,090$). This indicates that emotional connection and positive feelings cultivated through social media are paramount for luxury brands, aligning with the aspirational and experiential nature of luxury consumption (Ko et al., 2019). While non-luxury brands also elicit positive emotions (mean affection 3,76 for non-luxury vs 3,52 for luxury), these emotions do not translate as significantly into attitudes towards BExt, suggesting that other factors, possibly functional value, take precedence in this segment.

For H1c, which examined the positive influence of the Activation dimension of CE on attitudes towards BExt, the overall model demonstrated strong support ($\beta = 0,306$, $p = 0,000$). Interestingly, MGA showed no significant difference between luxury and non-luxury groups ($p = 0,696$). Activation CE was found to be significant for both non-luxury ($\beta = 0,215$, $p = 0,006$) and luxury ($\beta = 0,175$, $p = 0,006$) brands. This implies that active participation and behavioral manifestations on social media are universally important for shaping positive attitudes towards BExt, regardless of the brand's market positioning. Although the descriptive

mean for Activation was significantly lower for luxury brands (2,54) compared to non-luxury (3,63), the *strength of the relationship* where activation *does occur* is similar, suggesting active engagement, however frequent, holds consistent causal power.

Hypothesis H2, stating that Attitudes Towards Brand Extension positively influence Extended Brand Loyalty, was strongly supported in the overall model ($\beta = 0,674$, $p = 0,000$) and for both groups individually (non-luxury: $\beta = 0,617$, $p = 0,000$; luxury: $\beta = 0,651$, $p = 0,000$). MGA indicated no significant difference in the strength of this relationship between the groups ($p = 0,515$). This consistent finding across both market segments underscores the robust principle that a positive consumer evaluation of a brand extension is a critical precursor to loyalty towards that specific extended product (Burešová & Vavrek, 2024; Olaleye & Adeyeye, 2025). Despite non-luxury brands showing descriptively higher mean attitudes towards BExt (3,90) and extended brand loyalty (4,02) than luxury brands (3,42 and 3,38 respectively), the mechanism linking attitude to loyalty remains equally potent.

Similarly, H3, which proposed that Attitudes Towards Brand Extension positively influence Parent Brand Loyalty, was also strongly supported in the overall model ($\beta = 0,303$, $p = 0,000$) and individually for both non-luxury ($\beta = 0,335$, $p = 0,000$) and luxury ($\beta = 0,241$, $p = 0,003$) brands. MGA showed no significant difference between groups ($p = 0,371$). This result reinforces the concept of affect transfer (Kim & Ko, 2020) and confirms that positive attitudes towards a brand extension can "spill over" and strengthen loyalty towards the original parent brand (Boisvert (2020)). This effect is fundamental, demonstrating that successful extensions contribute not only to their own standing but also to the overall brand equity of the parent.

Hypothesis H4, which posited that Loyalty towards the Extended Brand positively influences Loyalty towards the Parent Brand, was significant in the overall model ($\beta = 0,445$, $p = 0,000$) and for both groups. However, MGA revealed a significant difference ($p = 0,002$), with this influence being substantially stronger for non-luxury brands ($\beta = 0,543$, $p = 0,000$) compared to luxury brands ($\beta = 0,251$, $p = 0,002$). This is a critical finding, extending the understanding of the "spillover effect" (Cho, Walker, & Nowlin, 2024; Yoo, 2024). For non-luxury brands, the success and loyalty garnered by an extension (e.g., Saturdays Coffee) play a more prominent role in reinforcing overall parent brand loyalty (Saturdays Eyewear). This suggests that non-luxury parent brands may rely more heavily on the performance of their extensions to maintain and grow their brand equity. Conversely, for luxury brands like Coach, which typically possess deeply entrenched brand equity built on exclusivity and heritage, loyalty to the parent brand may be less directly dependent on the performance of individual extensions. The mean scores for both extended and parent brand loyalty were descriptively higher for non-luxury (4,02 and 4,05) than for luxury (3,38 and 3,47), further illustrating this dynamic.

The mediation analysis further elucidated these differential impacts. For the overall model, Attitudes Towards Brand Extension (Z1) successfully mediated the influence of all CE dimensions on both Extended Brand Loyalty and Parent Brand Loyalty. The results are summarized in Table 7.

Table 7. Hypothesis Indirect Effect Testing Summary

Path	Complete Model			Non-Luxury			Luxury		
	β	t-value	p-value	β	t-value	p-value	β	t-value	p-value
CP → ATT → CL	0.086	4.305	0.000*	0.156	4.555	0.000*	0.025	1.296	0.196
AG → ATT → CL	0.057	3.102	0.002*	0.037	1.571	0.117	0.077	2.189	0.029*
ACT → ATT → CL	0.093	4.774	0.000*	0.072	2.546	0.011*	0.042	1.855	0.064
CP → ATT → BL	0.191	5.586	0.000*	0.288	5.661	0.000*	0.068	1.426	0.155
AG → ATT → BL	0.127	3.729	0.000*	0.067	1.661	0.097	0.209	3.912	0.000*
ACT → ATT → BL	0.206	7.286	0.000*	0.133	2.636	0.009*	0.114	2.683	0.008*

Note: CP = Cognitive; AG = Affection; ACT = Action; ATT = Attitude Towards Brand Extension; CL = Extended Brand Loyalty; BL = Brand Parent Loyalty. *means significance.

Source: Authors, 2025

Table 8 shows that multi-group analysis (MGA) highlighted varying mechanisms between non-luxury and luxury brand contexts for both direct and indirect effects. For direct effects, MGA revealed several significant differences. Specifically, the direct influence of Cognitive (CP) on Attitude Towards Brand Extension (ATT) (MGA p-value = 0.002) and Affective (AG) on Attitude Towards Brand Extension (ATT) (MGA p-value = 0.035) varied significantly between the non-luxury and luxury groups.

Table 8. Multi-Group Analysis (Non-Luxury vs. Luxury)

Path		MGA p-value	
Direct	Indirect	Direct	Indirect
CP → ATT	CP → ATT → CL	0.002*	0.002*
AG → ATT	AG → ATT → CL	0.035*	0.356
ACT → ATT	ACT → ATT → CL	0.696	0.413
ATT → CL	CP → ATT → BL	0.515	0.004*
ATT → BL	AG → ATT → BL	0.371	0.033*
CL → BL	ACT → ATT → BL	0.002*	0.782

Note: CP = Cognitive; AG = Affection; ACT = Action; ATT = Attitude Towards Brand Extension; CL = Extended Brand Loyalty; BL = Brand Parent Loyalty. *means significance

Source: Authors, 2025

This indicates that the formation of attitudes towards brand extension, driven by cognitive and emotional, operates with different strengths or characteristics depending on the brand context. Additionally, the direct effect of Extended Brand Loyalty (CL) on Brand Parent Loyalty (BL) also showed a significant difference between groups (MGA p-value = 0.002), implying that the relationship between loyalty to the extended brand and loyalty to the parent brand varies significantly across luxury and non-luxury domains. Conversely, the direct effects of Action Engagement (ACT) on ATT (MGA p-value = 0.696), ATT on CL (MGA p-value = 0.515), and ATT on BL (MGA p-value = 0.371) did not exhibit significant differences across the groups. This suggests that these relationships are broadly consistent regardless of the brand type.

MGA on indirect effects highlighted the varying mechanisms. The indirect effects of Cognitive CE (X1) via Z1 on both loyalties (Y and Z2) were significantly stronger for non-luxury brands (MGA p-values = 0,002 and 0,004 respectively). This underscores that for non-luxury brands, a cognitively driven positive attitude towards BExt is a crucial pathway to loyalty in this segment. In contrast, the indirect effect of Affective CE (X2) via Z1 on Extended Brand Loyalty (Z2) was significantly stronger for luxury brands (MGA p-value = 0,033). This indicates that for luxury brands, emotional connection driving positive BExt attitudes is a more potent pathway to extended brand loyalty. Its indirect effect on Parent Brand Loyalty (Y) did not differ significantly between groups (MGA p-value = 0,356). Notably, the indirect effects involving Activation CE (X3) did not show significant differences between groups, reiterating their universal mediating role.

These findings collectively highlight a significant novelty: the pathways through which social media CE influences BExt attitudes and brand loyalty are not universal but are distinctly shaped by whether a brand operates in the luxury or non-luxury segment. This extends previous research (Yoo, 2024; Kong et al., 2021) by disaggregating CE dimensions and demonstrating their differential effectiveness. For non-luxury brands, a strategy emphasizing cognitive engagement and ensuring strong performance of extensions to reinforce parent brand loyalty is crucial. For luxury brands, fostering emotional connections through affective engagement is key, with less reliance on extensions to bolster already robust parent brand loyalty. The critical and analytical tone adopted throughout the discussion ensures that interpretations are grounded in scholarly evidence, acknowledging both consistent and contradictory with existing literature, and minimizing undue speculation. The implications of these findings for marketers are substantial, informing tailored social media strategies.

CONCLUSIONS

This study provides a comprehensive examination of how Consumer Engagement (CE) on social media shapes attitudes toward Brand Extension (BExt) and subsequent brand loyalty, while explicitly accounting for differences between luxury and non-luxury brand contexts in an emerging digital economy. Consistent with contemporary engagement theory, the findings confirm that CE is a critical relational mechanism through which consumers evaluate brand extensions and develop loyalty outcomes in digitally mediated environments (Hollebeek & Macky, 2019; Hollebeek et al., 2022). Importantly, this research demonstrates that the influence of CE is not homogeneous but varies systematically according to brand type, thereby extending prior research that has largely treated engagement effects as universally applicable. At the empirical level, the results show that CE significantly influences attitudes toward brand extension, which subsequently foster loyalty toward both the extended brand and the parent brand. However, the relative importance of engagement dimensions differs between luxury and non-luxury brands. For non-luxury brands, cognitive engagement exerts a strong and significant effect on attitudes toward brand extension. This finding highlights the importance of rational information processing, functional evaluation, and value-oriented reasoning in non-luxury consumption contexts, where consumers tend to be more price-conscious and utility-driven (Kim & Ko, 2020; Burešová & Vavrek, 2024). Cognitive engagement allows consumers to reduce perceived risk and justify brand extensions based on tangible benefits, thereby strengthening extension acceptance and loyalty formation. In contrast, for luxury brands, affective engagement emerges as the primary driver of positive attitudes toward brand extensions. This result supports the view that luxury consumption is

predominantly shaped by emotional resonance, symbolic meaning, and aspirational value rather than functional considerations (Holmqvist et al., 2020; Ko et al., 2021). Luxury consumers are more responsive to emotionally evocative content that reinforces brand prestige, identity expression, and experiential value. Consequently, affective engagement serves as a critical mechanism through which luxury brands legitimize extensions and maintain brand desirability in digital environments. Interestingly, the activation dimension of CE, reflecting active participation, interaction, and contribution, exhibits a consistently significant influence on brand extension attitudes across both luxury and non-luxury contexts. This finding underscores the universal role of participatory engagement in social media ecosystems, regardless of brand positioning (Hollebeek & Macky, 2019; Lim et al., 2022). Active behaviors such as commenting, sharing, and co-creating content strengthen consumers' sense of involvement and psychological ownership, thereby enhancing evaluative outcomes toward brand extensions. This result reinforces the notion that engagement is not merely an attitudinal construct but a behavioral process that deepens relational bonds between consumers and brands.

Beyond attitudinal outcomes, the findings confirm that positive attitudes toward brand extensions consistently foster loyalty toward both the extended brand and the parent brand across segments. This result aligns with foundational brand extension principles, which posit that favorable extension evaluations serve as a precursor to loyalty formation (Burešová & Vavrek, 2024; Olaleye & Adeyeye, 2025). However, a key contribution of this study lies in revealing that the magnitude of loyalty spillover differs significantly between luxury and non-luxury brands. Specifically, loyalty toward the extended brand exerts a substantially stronger spillover effect on parent brand loyalty in non-luxury contexts compared to luxury contexts. This finding suggests that non-luxury consumers are more likely to generalize positive extension experiences to the parent brand, reinforcing overall brand loyalty (Cho et al., 2024). In luxury contexts, although the spillover effect remains significant, it is comparatively weaker. This pattern reflects the more compartmentalized and identity-driven nature of luxury brand relationships, where consumers may perceive extensions as distinct symbolic offerings rather than direct functional continuations of the parent brand (Holmqvist et al., 2020; Septianto et al., 2021). Thus, while extensions can enhance loyalty, luxury parent brands tend to rely on broader symbolic capital and long-term brand narratives rather than extension-based reinforcement alone.

Collectively, these findings demonstrate that the mechanisms through which social media CE influences brand extension success and loyalty are contingent upon brand positioning and underlying consumer motivations. Engagement dimensions interact with functional versus symbolic value structures, shaping how consumers interpret, evaluate, and respond to brand extensions. By empirically validating these differentiated pathways, this study advances a more nuanced and context-sensitive understanding of engagement-based branding in digital markets. From a theoretical standpoint, this research makes several important contributions. First, it extends consumer engagement theory by empirically disaggregating the effects of cognitive, affective, and activation engagement across luxury and non-luxury contexts. While prior studies have acknowledged the multidimensional nature of CE, empirical evidence on how these dimensions operate differently across market segments remains limited (Hollebeek et al., 2022). This study addresses that gap by demonstrating that engagement dimensions are selectively salient depending on brand characteristics and consumer value orientations.

Second, the study enriches brand extension literature by embedding extension evaluation within a relational, engagement-driven digital framework. Traditional brand extension research has primarily emphasized perceived fit and equity transfer as determinants of extension success. In contrast, the present findings highlight the role of ongoing social media engagement as a dynamic mechanism through which extension legitimacy and loyalty spillover are constructed (Yoo, 2024; Gielens & Steenkamp, 2021). This perspective aligns with contemporary branding theories that emphasize interaction, co-creation, and consumer participation as central to brand meaning formation. Third, by situating the analysis in Indonesia, this research enhances the contextual relevance of CE–BExt–loyalty models. Emerging markets are characterized by rapid digital adoption, high social media penetration, and socially embedded consumption patterns, which may amplify engagement effects (Septianto et al., 2021; Park & Ahn, 2025). The findings thus contribute to a growing body of literature calling for more culturally and structurally sensitive branding research beyond developed market settings.

From a managerial perspective, the results offer clear strategic implications. For luxury brands, social media strategies should prioritize affective and activation-based engagement, focusing on emotionally resonant storytelling, aspirational imagery, and interactive experiences that reinforce exclusivity and brand identity (Holmqvist et al., 2020; Junaid et al., 2022). Given the relatively strong inherent loyalty to luxury parent brands, managers should emphasize delivering consistent premium experiences through extensions rather than relying on extensions solely to strengthen parent brand loyalty. Conversely, for non-luxury brands, cognitive and activation engagement strategies are particularly critical. Information-rich content that highlights functional benefits, innovation, and value-for-money considerations can strengthen cognitive engagement and support favorable extension evaluations (Hollebeek & Macky, 2019; Burešová & Vavrek, 2024). The strong spillover effect observed in non-luxury contexts further underscores the importance of maintaining consistent quality across all extensions, as extension performance has pronounced implications for parent brand loyalty (Cho et al., 2024).

Despite these contributions, the findings of this study should be interpreted in light of several limitations. First, the relatively modest R-squared values suggest that additional factors beyond CE also influence brand extension attitudes and loyalty. Constructs such as brand trust, perceived value, brand authenticity, and perceived fit may further enhance explanatory power and warrant inclusion in future models (Burešová & Vavrek, 2024). Second, the cross-sectional design limits causal inference. Although the hypothesized relationships are theoretically grounded, longitudinal designs would allow for a more dynamic examination of how engagement, attitudes, and loyalty evolve over time (Park & Ahn, 2025). Multi-source or behavioral data could further mitigate potential common method bias. Most importantly, this study does not explicitly incorporate sociocultural factors such as collectivism and social confirmation. In communal societies like Indonesia, consumer behavior is strongly shaped by peer endorsement, social norms, and collective validation (Septianto et al., 2021). While these elements were excluded to maintain a focused examination of engagement dimensions, their omission represents a key limitation. Future research should integrate social-contextual variables to provide a more holistic understanding of consumer–brand dynamics in emerging markets. Future studies may also adopt mixed-methods approaches to uncover why certain engagement dimensions are more salient in specific brand contexts, such as why cognitive engagement is less impactful for luxury brands or affective engagement for non-luxury brands (Junaid et al., 2022). Extending the analysis

across industries, cultures, and digital platforms would further enhance the generalizability and theoretical robustness of engagement-based brand extension models.

REFERENCES

- Aaker, D. A. (1996). *Building strong brands*. Free Press.
- Aaker, D. A., & Keller, K. L. (1990). Consumer evaluations of brand extensions. *Journal of Marketing*, 54(1), 27–41.
- Al-Fraihat, A. H., Joy, M., & Sinclair, M. (2020). Evaluating e-learning systems success using PLS-SEM. *Smart Learning Environments*, 7(1), 1–17.
- Boisvert, J. (2020). The reciprocal impact of vertical service line extensions on parent brands: The roles of innovativeness, quality, and involvement. *Journal of Services Marketing*, 34(5), 637–648. <https://doi.org/10.1108/JSM-04-2019-0153>
- Boisvert, J., & Ashill, N. J. (2022). The impact of luxury brand status signaling, extension authenticity and fit on luxury line extension evaluation: A cross-national study. *International Marketing Review*, 39(2), 395–422. <https://doi.org/10.1108/IMR-03-2021-0113>
- Burešová, J., & Vavrek, R. (2024). Incorporating new variables into a model of brand extension in fast fashion. *Innovative Marketing*, 20(2), 244–256. [https://doi.org/10.21511/im.20\(2\).2024.20](https://doi.org/10.21511/im.20(2).2024.20)
- Cho, J., Walker, D., & Nowlin, E. L. (2024). NPS spillover in brand extensions: An empirical study. *International Journal of Market Research*, 66(2–3), 359–371. <https://doi.org/10.1177/14707853231225366>
- Douven, I. (2018). A Bayesian perspective on Likert scales and central tendency. *Psychonomic Bulletin & Review*, 25(3), 1203–1211. <https://doi.org/10.3758/s13423-017-1344-2>
- Gielens, K., & Steenkamp, J. B. E. M. (2021). Branding in the era of digital (dis)intermediation. *International Journal of Research in Marketing*, 38(4), 867–886. <https://doi.org/10.1016/j.ijresmar.2021.07.005>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2022). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). Sage.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Hollebeek, L. D., Sprott, D. E., & Brady, M. K. (2022). Consumer engagement in the digital era: Its nature, drivers, and outcomes. *Journal of the Academy of Marketing Science*, 50(4), 673–698. <https://doi.org/10.1007/s11747-021-00818-7>
- Jordan, P. J., & Troth, A. C. (2019). Common method bias in applied settings: The dilemma of research practice. *Journal of Applied Psychology*, 105(8), 852–865.
- Junaid, M., Hussain, K., Asghar, M. M., Javed, M., & Hou, F. (2022). Analyzing intention to purchase brand extension. *Frontiers in Psychology*, 13, 884673. <https://doi.org/10.3389/fpsyg.2022.884673>
- Kim, A. J., & Ko, E. (2020). The impact of brand personality on brand attachment and brand commitment. *Journal of Business Research*, 117, 637–645. <https://doi.org/10.1016/j.jbusres.2018.10.040>
- Ko, E., Costello, J. P., & Taylor, C. R. (2019). What is a luxury brand? A new definition and review of the literature. *Journal of Business Research*, 99, 405–413. <https://doi.org/10.1016/j.jbusres.2017.08.023>

- Ko, E., Megehee, C. M., & Lee, S. (2021). Luxury brand extensions: A review and future research directions. *Journal of Brand Management*, 28(5), 465–482. <https://doi.org/10.1057/s41262-021-00242-6>
- Kong, Q., Zhu, L., & Liu, Y. (2021). The effects of social media marketing activities on luxury brand purchase intention. *Journal of Retailing and Consumer Services*, 58, 102282. <https://doi.org/10.1016/j.jretconser.2020.102282>
- Lim, W. M., Rasul, T., Kumar, S., & Ala, M. (2022). Past, present, and future of customer engagement. *Journal of Business Research*, 140, 439–458. <https://doi.org/10.1016/j.jbusres.2021.11.014>
- Malhotra, N. K. (2010). *Marketing research: An applied orientation* (6th ed.). Pearson Education.
- Olaleye, B. R., & Adeyeye, M. O. (2025). Brand extension strategies and customer loyalty. *Innovative Marketing*, 21(1), 270–280. [https://doi.org/10.21511/im.21\(1\).2025.22](https://doi.org/10.21511/im.21(1).2025.22)
- Park, J., & Ahn, S. (2025). Unpacking masstige brand perception. *Journal of Retailing and Consumer Services*, 87, 104373. <https://doi.org/10.1016/j.jretconser.2025.104373>
- Septianto, F., Seo, Y., & Errmann, A. C. (2021). Distinct effects of pride and gratitude on consumer word-of-mouth. *Psychology & Marketing*, 38(7), 1115–1130. <https://doi.org/10.1002/mar.21493>
- Yoo, J. (2024). The impact of social media brand engagement on consumer attitude toward brand extension. *Journal of Brand Management*, 31(2), 123–138. <https://doi.org/10.1057/s41262-023-00335-4>



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 19 No. 1, 2026 (February), 20-40



IMPLICATIONS OF INTERPERSONAL CONFLICT FOR PHYSICIANS' TASK PERFORMANCE: WORKPLACE DEVIANCE AS A MEDIATOR



SINTA 2

Andri Sulaksono¹⁾, Burhan Bungin²⁾, Liliana Dewi³⁾, Alexander Hiro
Wibisono⁴⁾, Andhein Syifa Tsabita⁵⁾

^{1,2,3,4} Universitas Ciputra Surabaya, Surabaya, Indonesia

⁵ Universitas Nahdlatul Ulama Surabaya, Surabaya, Indonesia

Email: andrisulaksono@gmail.com

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p02>

ABSTRACT

Medical environments frequently encounter interpersonal tensions that influence clinical effectiveness and may shape how physicians carry out their tasks. Grounded in Social Exchange Theory and Conservation of Resources Theory, this study examines the link between interpersonal conflict and physicians' task performance by considering workplace deviance as a mediating mechanism. Using a cross-sectional design and surveyed a population of physicians in various healthcare facilities in Surabaya. Using purposive sampling than collected data from 150 respondents via an online, self-administered structured questionnaire. The data were analyzed with PLS-SEM. The measurement model met all reliability and validity criteria, and the structural model demonstrated significant explanatory and predictive power. The findings indicate that conflict can actually enhance performance when it is managed as task-focused disagreement within a framework of strong professional controls. In contrast, deviant behaviors consistently undermine performance. Furthermore, workplace deviance partially mediated the relationship between conflict and performance. Based on these findings, the study offers practical solutions for healthcare organizations in Indonesia. Include implementing effective conflict management, providing communication training, and consistently enforcing a code of ethics to harness potential benefits of task-related conflict.

Keywords: interpersonal conflict; workplace deviance; task performance; healthcare management; physicians.

INTRODUCTION

Workplace conflict is an unavoidable organizational reality, particularly in healthcare environments characterized by high work pressure and stringent accuracy demands. In healthcare settings, physicians often occupy a central decision-making role in clinical teams, requiring them to shoulder heavier workloads; such as simultaneously providing competent clinical care while coordinating with nurses, pharmacists, laboratory staff, and other service managers. However, interprofessional collaboration does not always proceed harmoniously. Yusoff et al. (2023), highlight that workplace violence and hostility toward primary care staff or healthcare workers, whether verbal, physical, or psychological have become a growing global concern with serious implications for staff well-being and performance. Reinforcing this phenomenon, Zeng et al. (2025) reported that 44.3% of primary care physicians in Chengdu, China, experienced at least one episode of workplace violence in the past year

(emotional abuse, threats, physical assault, sexual harassment) from coworkers, patients, or patients' families. While workplace violence represents an extreme manifestation, this study focuses on everyday interpersonal conflict among physicians and coworkers that can shape how tasks are executed in clinical teams. These findings underscore the need for formal preparation of healthcare workers to recognize, de-escalate, and manage workplace conflict and violence.

In Indonesia, empirical evidence indicates that conflicts among physicians and coworkers are often triggered by workload pressure and stress, differences in clinical judgments and role expectations, as well as knowledge limitations such as restricted training and weak team communication (Dewi et al., 2025; Kusuma et al., 2021; Rina et al., 2019). These conditions are exacerbated by administrative burdens, referral systems, seemingly overlapping government programs, drug supply issues, and asymmetries between senior and junior physicians. Although comprehensive national statistics are limited, field evidence shows that interpersonal conflict is not merely a psychological inconvenience but has direct implications for service quality, work effectiveness, and patient satisfaction. In short, conflict in clinical organizations is not a peripheral issue but resides at the intersection of professional identity, coordination, and safety.

Interpersonal conflict warrants special attention because it can trigger various adverse effects. Recent studies show that inter-individual conflict can reduce task focus, increase emotional strain, and heighten the likelihood of deviant behavior (Abunemeh, 2024; Beenish Khan & Amir Azam, 2022). For physicians working shifts in emergency departments (ED), delivery rooms, or Intensive Care Units (ICUs) requiring complex management, prolonged conflict can trigger frustration, cognitive fatigue, and ultimately job burnout. Ben Natan (2025), Cullati et al. (2019), and Lewis (2023) argue that conflict among healthcare workers contributes to medical errors and undermines the accuracy of clinical decision-making. Consistent with this, Qiu et al. (2025) also documented strong associations between interpersonal conflict, emotional exhaustion, and psychological distress among healthcare workers.

Within Indonesia's health system, workload and stress have been linked to deteriorating team functioning and declining performance. Rauf et al. (2020) found that communication accounted for 63.3% of the main causes of conflict among nurses at Haji Public Hospital Makassar. Ineffectively managed conflict impedes teamwork and reduces productivity and job satisfaction, thus emphasizing the need for early detection and structured conflict management to build a conducive work environment. Rina et al. (2019) further reported that workload and interpersonal conflict significantly suppress nursing performance. At the system level, the implementation of National Health Insurance (JKN) adds complex administrative demands that can burden doctor-patient relationships and service smoothness (Ekawati & Claramita, 2021). Consequently, conflict arises not only from clinical disagreements but also from workload allocation, seniority dynamics, and cross-professional communication barriers.

In modern organizational studies, task performance is a key indicator of human resource productivity and effectiveness. In healthcare, physician task performance is a key productivity indicator, encompassing diagnostic accuracy, treatment appropriateness, adherence to standard operating procedures (SOPs), interprofessional coordination (Claramita et al., 2020), and competence indicators (Krijgsheld et al., 2022). When interpersonal conflict arises, physicians' cognitive and emotional resources are divided between task execution and

efforts to repair relationships or respond to conflict, with subsequent consequences for impaired performance quality and patient safety. Zhang et al. (2021) and Roth et al. (2024) argue that conflict redistributes psychological resources within medical teams and can ultimately weaken clinical performance, meaning in medical contexts, conflict is not just about interpersonal relationships, but a systemic problem threatening service quality through the mechanism of depleting the team's cognitive resources.

This dynamic can be understood through the lens of Social Exchange Theory (Blau, 2017), where unfair or unpleasant interactions create relational imbalance and can trigger negative reciprocity. In healthcare organizations, physicians who feel undervalued or treated unfairly by colleagues, whether intentionally or not, may reduce the quality of task performance, visible through slow documentation, cursory procedures, or diminished initiative to coordinate across professional boundaries. The primary pathway linking conflict to performance decline is workplace deviance, conscious behavior violating organizational norms and potentially harming the institution or its members (Calderwood et al., 2021). Combined multi-wave and multi-source evidence in Kundi et al. (2023), research provides high confidence that deviance indeed serves as the mechanism connecting conflict to performance, not merely coincidence or methodological bias. Deviance mediates the negative effect of interpersonal conflict on task performance (Kundi et al., 2023). In hospitals, deviance can include delaying tasks, passive resistance to supervisory instructions, or restricting communication to selected colleagues. McCarthy et al. (2021), showed that unresolved conflict increases the likelihood of such behaviors, which in turn suppress productivity and service quality. Kundi & Badar (2021); see also Kundi et al. (2023) provided further evidence that workplace deviance significantly transmits the impact of conflict onto task performance. However, most of this evidence comes from business or administrative contexts; physician-specific settings, where responsibilities directly affect patient lives and professional ethics are stringent, remain understudied.

Nevertheless, not all conflict is harmful. When managed functionally, conflict can stimulate scientific knowledge transfer and strengthen team decisions (Walker & Daniels, 2019). Therefore, distinguishing constructive task conflict (differences in viewpoints about clinical work) from destructive relationship conflict (personal tension, disrespect, behavior) becomes crucial. Under conditions of psychological safety and strong collaborative norms, task-focused disagreement can prompt evidence clarification, problem clarity, peer collaboration, and tighter coordination that ultimately improves task performance (Fairchild et al., 2025; Kumar, 2025). Conversely, without such conditions, conflict tends to evolve into hostility, emotional tension, and counterproductive behavior. In practice, poorly handled conflict increases burnout, erodes job satisfaction, decreases organizational compliance, fuels turnover intention, and degrades clinical decision quality, with documented links to diagnostic and procedural errors (Lee et al., 2024).

Despite the growing global literature, important gaps remain for the Indonesian context. First, many studies aggregate "health workers" without distinguishing physicians as a professional group with distinct authority, responsibilities, and coordination demands. Second, few investigations explicitly test workplace deviance as a mediating mechanism between conflict and physician task performance. Third, contextual features of Indonesia's health system. Bureaucracy, human resource shortages, and administrative pressure amplified by the National Health Insurance program remains underrepresented in mainstream discourse. Finally, evidence from Sub-Saharan Africa shows that conflict impact is not uniform; for

instance, in Ugandan general hospitals, workplace conflict did not significantly predict performance after leadership, culture, and resources were accounted for (Atwiine et al., 2024), aligning with broader findings that job resources moderate leadership effects, culture shapes retention, and values-based leadership and working conditions can enhance service performance (Margaret & Isaac, 2025; Mayende & Musenze, 2018; Mutumba et al., 2025; Shumba et al., 2017). It is evident that leadership is not a magical solution—its effectiveness highly depends on a supportive resource ecosystem. In healthcare contexts, this explains why excellent leaders in resource-poor hospitals may not achieve significant results. These mixed findings demonstrate that context and controls matter, raising a critical question for Indonesian clinical organizations: under what conditions does conflict harm or help physician performance, and through which behavioral channels?

To address these gaps, this study focuses on physicians in Indonesian healthcare facilities and pursues three objectives: (i) to test the relationship between interpersonal conflict (IC) and physician task performance (TP) within a clinical governance environment; (ii) to examine the relationships between IC and workplace deviance (WP), and between WP and TP, as behavioral mechanisms linking conflict to performance; and (iii) to assess whether WP mediates the relationship between IC and TP (complementary or competitive), thereby clarifying when and how conflict affects performance in medical teams.

The research is expected to contribute to (a) theory by testing deviance as a behavioral conduit between conflict and performance in a setting with strong professional controls; (b) contextual understanding by situating Indonesian features SOPs, accreditation, electronic medical record systems' (EMR) visibility, and hierarchical teams within contemporary conflict theory; and (c) practice by generating actionable implications for conflict management training, physician communication, and micro-governance mechanisms that detect and reduce deviance (e.g., documentation lag dashboards, closed-loop compliance checks).

Interpersonal conflict refers to perceived incompatibilities or disagreements between physicians and coworkers regarding work-related issues (task or relationship). Deviant workplace behavior refers to voluntary behavior that violates significant organizational norms and, in doing so, threatens the well-being of an organization, its members, or both (Atwiine et al., 2024; Robinson & Bennett, 1995). In hospital environments, this could include acts like intentionally delaying documentation, bypassing safety checks, or selectively communicating with specific team members. Physician task performance encompasses documentation completeness, diagnostic consistency, treatment appropriateness, adherence to SOPs, interprofessional coordination (Claramita et al., 2020), and competence indicators (Krijgheld et al., 2022). Although the quality of healthcare outcomes received by patients is shaped by many factors, task performance (of physicians) remains a proximal indicator. A direct measure of clinical processes controllable by physicians before final patient outcomes are visible and is manageable (monitorable, evaluable, and improvable) managerially in daily clinical work.

Based on the literature, this research framework positions Interpersonal Conflict (IC) as the exogenous variable, Task Performance (TP) as the endogenous variable, and Workplace Deviance (WP) as the mediator. The model acknowledges two possibilities observed in previous research: (i) conflict can decrease performance directly (through strain) and indirectly (through deviance), yet under specific boundary conditions, especially when conflict is strictly task-focused within psychologically safe teams, where the conflict type is task conflict (debate about the best way to handle patients), not relationship conflict (personal

conflict), and where there is psychological safety, team members feel safe expressing opinions without fear of humiliation or punishment. (ii) conflict may be neutral or even beneficial by promoting evidence examination and coordination. Evidence examination means conflict forces the team to review evidence, checklists, and guideline usage more meticulously, and coordination means differences of opinion actually clarify roles and enhance communication among professionals.

Social Exchange Theory (SET) explains that workplace interactions shape reciprocity expectations; unfavorable exchanges can reduce cooperation and increase withdrawal or counterproductive responses (Blau, 2017). In healthcare organizations, however, reciprocity is shaped by strong professional norms, peer visibility, and reputational stakes. Clinical governance mechanisms (e.g., SOPs, case discussions, audits, and professional committees), which the reputational and procedural consequences of misconduct. Under such conditions, interpersonal friction may be more likely to trigger self-regulation and compliance than retaliatory deviance. Evidence from Indonesian organizational settings also highlights the centrality of relational mechanisms: empowering leadership can improve employee performance through increased trust in managers, supporting the practical relevance of reciprocity and trust pathways in shaping behavior.

Conservation of Resources (COR) theory complements this view by proposing that interpersonal conflict threatens key resources such as time, cognitive focus, emotional energy, and professional standing (Hobfoll, 1989). When resources are threatened, individuals tend to prioritize loss-avoidance strategies. In high-stakes clinical settings, deviant behavior (e.g., delaying documentation, bypassing safety checks, or withholding information) entails disproportionate risks because actions are traceable, auditable, and sanctionable. Thus, COR suggests that conflict may prompt physicians to conserve resources by adhering more strictly to routines and formal procedures, thereby reducing workplace deviance.

At the same time, interpersonal conflict is not uniformly detrimental. When disagreements remain task-focused rather than personal, conflict can stimulate deeper evidence scrutiny, clarify role expectations, and strengthen coordination, which may enhance task performance. A supportive interpersonal climate is critical for this constructive pathway; evidence from Indonesian organizations indicates that interpersonal trust facilitates knowledge sharing and is associated with higher job satisfaction, conditions that are consistent with productive information exchange rather than interpersonal hostility (Noerchoidah et al., 2022; Sudiyani & Rihayana, 2025). Integrating SET and COR, this study proposes that in governance-rich healthcare organizations, interpersonal conflict may improve physician task performance directly and indirectly by suppressing workplace deviance, whereas workplace deviance is expected to consistently undermine performance.

Based on the theoretical arguments above, the following hypotheses are formulated:

- H₁.** Interpersonal conflict is negatively associated with physician task performance.
- H₂.** Interpersonal conflict is positively associated with workplace deviance.
- H₃.** Workplace deviance is negatively associated with physician task performance.
- H₄.** Workplace deviance mediates the relationship between interpersonal conflict and task performance.

Data analysis in this study uses PLS-SEM to test the proposed model because (i) the study emphasizes prediction and explanation of variance in TP and WP rather than global goodness-of-fit; (ii) the model includes a mediation mechanism (WP) with several latent constructs and indicators, for which PLS-SEM is highly suitable for complex paths and non-

normally distributed data; (iii) this approach is robust with moderate sample sizes and allows assessment of out-of-sample predictive relevance (e.g., PLSpredict/Q²); and (iv) it facilitates simultaneous evaluation of measurement quality (reliability, convergent/discriminant validity) and structural relationships without imposing strict multivariate normality assumptions. These features align with this study's objective to quantify explanatory and predictive power in a clinically realistic, governance-rich environment.

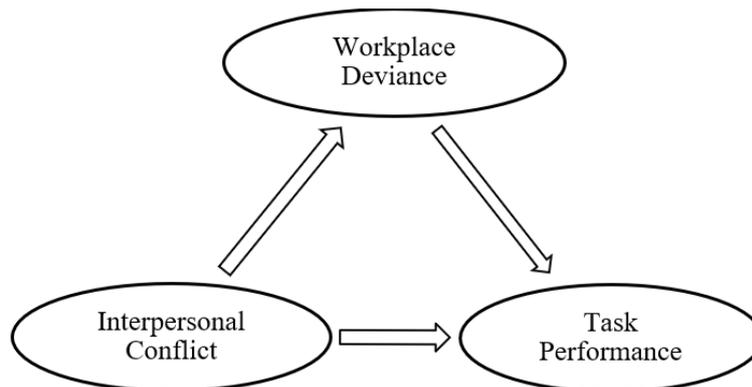


Figure 1. Conceptual Framework

Source: Author, 2026

The next section details the methods, measures, and analytical strategy. We then present the results, followed by a discussion that interprets the relationships between IC and TP, IC and WP, and WP and TP, as well as the mediation mechanism, within the context of Indonesian clinical governance. The paper concludes by outlining practical and theoretical implications for leaders and policymakers, study limitations, and directions for future research.

METHODS

This study employed a quantitative approach with a cross-sectional research design conducted in Surabaya, East Java. The research setting encompasses the city's diverse healthcare ecosystem, which includes 63 public health centers (*puskesmas*) and three major public hospitals (Type B)(Health Ministry of Indonesia, 2023). Physicians were recruited purposively from within this ecosystem through online surveys distributed via professional networks and associations. This approach ensured that respondents came from a variety of organizational settings such as public hospitals, private hospitals of different classes, and *puskesmas* to capture relevant variations in organizational forms, patient care processes, and workload characteristics. This variation is expected to provide a comprehensive picture of interpersonal conflict dynamics across different types of healthcare organizations.

The population and target of this research included general practitioners and specialists actively engaged in clinical practice at the selected facilities during the research period from January to July 2025. The established inclusion criteria comprised a minimum of one year of work at the relevant institution and active involvement in multidisciplinary medical teams, while physicians who refused participation, did not complete the questionnaire, or were on extended leave were excluded from the study. A purposive sampling strategy was applied to

recruit physicians whose profiles aligned with the research objective, ensuring representation from different facility types (public hospitals, private hospitals, and *puskesmas*) and a mix of general practitioners and specialists. While the exact distribution across each specific facility was not recorded, the sample aimed to reflect the diversity of clinical settings in Surabaya.

Sample size determination referred to general PLS-SEM guidelines recommended by Hair et al. (2019), Hair et al. (2021), and Kock & Hadaya (2018) with the minimum sample size set at approximately 5–10 times the number of indicators. The final reflective measurement model retained 18 indicators that consisting of five for Interpersonal Conflict (IC), seven for Workplace Deviance (WP), and six for Task Performance (TP). Implying a desired sample range of approximately 90–180 observations. Overall, 150 complete responses were obtained that met these guidelines and supported stable parameter estimation in the analysis. A response rate of 75% from 200 distributed questionnaires indicated adequate participation for further analysis.

Primary data were collected using self-administered closed questionnaires with a five-point Likert scale (from strongly disagree to strongly agree) distributed through online platforms. The instruments were adapted from standard sources and contextualized to the daily practice of physicians in Indonesian healthcare organizations. Interpersonal Conflict (IC) was measured using five questionnaire items capturing the frequency and intensity of perceived conflictual interactions with coworkers and other clinicians, referencing previous works while ensuring relevance to clinical teams. Although labeled as interpersonal conflict, the IC items were phrased to capture task-focused disagreements (e.g., differences in clinical judgments/procedures) rather than interpersonal hostility. Therefore, the measured IC in this study is conceptually closer to task conflict than relationship conflict. Workplace Deviance (WP) initially included ten indicators of deviant behavior developed through preliminary studies; however, through initial measurement screening with exploratory factor analysis, three items with outer loadings below 0.70 (WP3, WP5, WP7) were eliminated, leaving seven indicators for the final model (adapted primarily and related work behavior scales). Workplace deviance (WP) was operationalized as self-reported frequency/endorsement of behaviors that intentionally deviate from expected professional/organizational standards. All WP items were coded so that higher scores indicate higher deviance. If any items were positively worded (compliance-oriented), they were reverse-coded prior to analysis to ensure directional consistency across indicators. Task Performance (TP) was measured with six indicators, emphasizing the ability to complete assigned tasks, maintain service quality, and adhere to clinical and administrative procedures. Secondary sources (indexed journal articles and academic books) were used to confirm construct definitions and adapt item wording to suit the medical profession.

Initial data screening ensured questionnaire completeness for the variables of interest, enabling analysis without imputation. The PLS-SEM approach was chosen as it does not assume multivariate normality and is suitable for complex models with moderate sample sizes, although collinearity among predictors was still examined using the variance inflation factor (VIF) with a threshold of 3.3 to avoid bias in path estimates. Given the reflective model specification, measurement evaluation was conducted by examining indicator reliability (outer loading with target ≥ 0.70), internal consistency reliability (Cronbach's alpha and composite reliability ≥ 0.70), and convergent validity (average variance extracted/AVE ≥ 0.50). Discriminant validity was assessed using the heterotrait-monotrait (HTMT) ratio with conservative (< 0.85) and liberal (< 0.90) thresholds, and cross-checked using the Fornell-

Larcker criterion (square root of AVE exceeding inter-construct correlations). Where relevant, the Dijkstra-Henseler rho (ρ_A) was also inspected to supplement evidence of internal consistency.

Structural relationships among IC, WP, and TP were tested using nonparametric bootstrapping with 5000 subsamples to obtain standard errors, t-values, and 95% confidence intervals for path coefficients. Structural model quality was assessed using the coefficient of determination (R^2) for endogenous constructs with interpretation of weak (>0.25), moderate (>0.50), and substantial (>0.75), local effect size (f^2) to quantify each predictor's contribution with categories of small (0.02), medium (0.15), large (0.35), and Stone-Geisser predictive Q^2 (through blindfolding) to evaluate out-of-sample predictive relevance with values >0 indicating predictive relevance. To enhance reporting transparency, the researchers reported a series of fit and discrepancy indices common in variance-based SEM, namely standardized root mean square residual ($SRMR < 0.08$), and supplementarily, normed fit index ($NFI > 0.90$) and discrepancy measures d_{ULS} and d_G with acknowledgment that these indices are complementary and do not replace the predictive orientation of PLS.

Three layers of quality control were applied in this study within the analytical workflow. First, monitoring multicollinearity at the outer and inner model levels with $VIF < 3.3$ to limit standard error inflation. Second, mitigating common method bias through questionnaire design with item mixing and variation of anchor points, and statistical examination through full collinearity VIF. Third, assessing the robustness of the hypothesized mediation (IC to WP to TP) not only through path significance but also through the magnitude of indirect effects and their confidence intervals, with consideration of variance accounted for (VAF) to categorize mediation types.

Participation was voluntary with implementation of informed consent explaining the right to withdraw without consequences, and data confidentiality was maintained through response anonymity, identity coding, and aggregate reporting of results. No personal identification data were collected, and responses were analyzed and reported in aggregate to maintain confidentiality. Data storage protocols followed electronic data protection standards with encryption and specific retention periods.

Overall, the methodological choices applied from sample design considering setting heterogeneity to data analysis with PLS-SEM were designed to produce findings that not only meet academic standards but are also relevant to the practical reality of physician work in Indonesia. Several methodological limitations are acknowledged, including the cross-sectional nature that limits causal inference and potential self-report bias despite mitigation efforts. This approach is expected to bridge the gap between methodological rigor and practical contextualization in healthcare management studies in Indonesia.

RESULTS AND DISCUSSION

The demographic composition of the study sample is presented in Table 1, detailing the distribution of respondents across key characteristics including sex and age categories. This comprehensive profiling establishes the foundational context for understanding the participant base upon which subsequent analyses of interpersonal conflict, workplace deviance, and task performance dynamics are constructed.

Table 1 presents the demographic profile of the 150 physician respondents. The sample comprised 102 males (68%) and 48 females (32%), with a gender ratio of approximately 2:1. In terms of age distribution, 82 respondents (55%) were in the 46-60 years

cohort, while 68 respondents (45%) were in the 30-45 years cohort. The majority of respondents were thus senior clinicians, a factor that may influence the study's dynamics related to professional conflict and performance.

Table 1. Respondent Characteristics of Physician Respondents (N = 150)

Characteristic	Category	Number of Respondent	Percentage
Sex	Male	102	68%
	Female	48	32%
	Total	150	100%
Age	30 – 45 years	68	45%
	46 – 60 years	82	55%
	Total	150	100%

Source: Data processed, 2025

Table 2 presents the outer loadings of the reflective indicators for all constructs. All loading values exceed the recommended threshold of 0.70, demonstrating satisfactory indicator reliability (Hair et al., 2021). The strong loadings (ranging from 0.740 to 0.956) indicate that all items are adequate measures of their respective latent constructs and that the measurement model possesses good convergent validity at the indicator level.

Table 2. Outer Loading for the Reflective Measurement Model

Construct	Indicator	Outer loadings
Interpersonal Conflict	IC1 <- IC	0.945
	IC2 <- IC	0.956
	IC3 <- IC	0.910
	IC4 <- IC	0.918
	IC5 <- IC	0.881
Task Performance	TP1 <- TP	0.761
	TP2 <- TP	0.896
	TP3 <- TP	0.882
	TP4 <- TP	0.771
	TP5 <- TP	0.759
	TP6 <- TP	0.794
Workplace Deviance	WP1 <- WP	0.852
	WP10 <- WP	0.789
	WP2 <- WP	0.801
	WP4 <- WP	0.773
	WP6 <- WP	0.768
	WP8 <- WP	0.838
	WP9 <- WP	0.740

Source: Data processed, 2025

Table 3 presents the results for assessing the measurement model's internal consistency reliability and convergent validity. All constructs demonstrate excellent reliability, with Composite Reliability (ρ_c) values exceeding 0.90, surpassing the recommended threshold of 0.70. Similarly, Cronbach's Alpha and ρ_A (ρ_A) for all constructs are above 0.89, further confirming the high internal consistency of the measures. For convergent validity, all

constructs meet the requirement as their Average Variance Extracted (AVE) values are above 0.50. This indicates that more than 50% of the variance in the indicators is explained by their respective latent constructs, confirming that the measures well-represent their intended theoretical concepts.

Table 3. Internal Consistency Reliability and Convergent Validity of the Measurement Model (Cronbach's Alpha, rho_A, Composite Reliability, and AVE)

	Cronbach's Alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Interpersonal Conflict	0.956	0.962	0.966	0.851
Task Performance	0.896	0.902	0.921	0.660
Workplace Deviance	0.903	0.904	0.923	0.633

Source: Data processed, 2025

The discriminant validity of the constructs was assessed using both the Heterotrait-Monotrait (HTMT) ratio and the Fornell-Larcker criterion. As shown in Table 4, all HTMT values are below the conservative threshold of 0.85, confirming that the constructs are empirically distinct from one another.

Table 4. Discriminant Validity Assessment Using the Heterotrait-Monotrait (HTMT) Ratio

	Interpersonal Conflict	Task Performance	Workplace Deviance
Interpersonal Conflict			
Task Performance	0.681		
Workplace Deviance	0.660	0.778	

Source: Data processed, 2025

Furthermore, the Fornell-Larcker criterion was also satisfied, as shown in Table 5. The square root of the Average Variance Extracted (AVE) for each construct (diagonal values) was greater than its correlations with all other constructs (off-diagonal values). This result provides additional evidence of discriminant validity, confirming that the three constructs measure distinct phenomena.

Table 5. Discriminant Validity Assessment Using the Fornell-Larcker Criterion

Construct	Interpersonal Conflict	Task Performance	Workplace Deviance
Interpersonal Conflict	0.922	0.632	-0.621
Task Performance	0.632	0.812	-0.707
Workplace Deviance	-0.621	-0.707	0.795

Note: Diagonal elements (in bold) represent the square root of the AVE.

Source: Data processed, 2025

The results from both tests collectively affirm that Interpersonal Conflict, Task Performance, and Workplace Deviance are distinct constructs, thereby supporting the structural and conceptual validity of the measurement model.

The reflective measurement model was evaluated for reliability and validity, and it met all standard quality criteria. As shown in Table 2, all outer loadings exceeded 0.70,

confirming adequate indicator reliability. Internal consistency was established with Cronbach's Alpha and Composite Reliability values above 0.70 for all constructs, while convergent validity was satisfied as all Average Variance Extracted (AVE) values were greater than 0.50 see Table 3.

Discriminant validity was verified through multiple tests. All Heterotrait-Monotrait (HTMT) ratios were below the 0.90 threshold shown in Table 4, and the Fornell-Larcker criterion was met, with the square root of each construct's AVE being greater than its correlations with other constructs at Table 5. Finally, cross-loading analysis was conducted to further verify discriminant validity at the indicator level.

Cross-loading analysis was conducted to further verify discriminant validity at the indicator level. As presented in Table 6, each indicator's loading on its associated construct is higher than its cross-loadings on all other constructs. For instance, indicator IC1 loads highest on Interpersonal Conflict (0.945) compared to Task Performance (0.654) and Workplace Deviance (-0.585). This pattern holds for all indicators.

Table 6. Cross-Loadings of Indicators Across Constructs (Indicator-Level Discriminant Validity Check)

	Interpersonal Conflict	Task Performance	Workplace Deviance
IC1	0.945	0.654	-0.585
IC2	0.956	0.585	-0.644
IC3	0.910	0.551	-0.514
IC4	0.918	0.586	-0.637
IC5	0.881	0.531	-0.456
TP1	0.488	0.761	-0.605
TP2	0.516	0.896	-0.666
TP3	0.530	0.882	-0.607
TP4	0.439	0.771	-0.416
TP5	0.607	0.759	-0.488
TP6	0.494	0.794	-0.622
WP1	-0.591	-0.572	0.852
WP10	-0.396	-0.594	0.789
WP2	-0.509	-0.495	0.801
WP4	-0.454	-0.572	0.773
WP6	-0.499	-0.544	0.768
WP8	-0.491	-0.599	0.838
WP9	-0.502	-0.561	0.740

Source: Data processed, 2025

The structural model shows moderate explanatory power for Task Performance and weak-to-moderate explanatory power for Workplace Deviance (Table 7–8). Specifically, the model explains 56.1% of the variance in TP ($R^2 = 0.561$) and 38.5% of the variance in WP ($R^2 = 0.385$). Predictive relevance was examined using PLSpredict with 10 folds (Table 9). Both endogenous constructs yielded positive Q^2_{predict} values (TP = 0.388; WP = 0.367), indicating that the model has out-of-sample predictive relevance.

Table 7. R Square (R²) and Adjusted R Square (R² Adjusted) for Endogenous Constructs in the Structural Model

Construct	R ²	R ² Adjusted
TP	0.561	0.555
WP	0.385	0.381

Source: Data processed, 2025

Following Hair et al. (2019), $R^2 \geq 0.75$ = substantial, ≥ 0.50 = moderate, ≥ 0.25 = weak. TP shows $R^2 = 0.561$ (moderate): 56.1% of TP variance is explained by IC and WP ($p < 0.001$). WP shows $R^2 = 0.385$ (weak-to-moderate): 38.5% of WP variance is explained by IC ($p < 0.001$). The adjusted R^2 values, which account for model complexity and sample size, are only marginally lower than the R^2 values. This minimal difference suggests that the model is robust and not overfitted, confirming the stability and generalizability of the explanatory power.

The model's predictive relevance was assessed using the PLSpredict procedure with 10 folds. As shown in Table 8, both endogenous constructs yielded positive Q^2_{predict} values, which confirms that the model possesses out-of-sample predictive power. The Q^2_{predict} value for Task Performance (TP) was 0.388, and for Workplace Deviance (WP) it was 0.367.

Table 8. Predictive Relevance (Q^2_{predict}) and Prediction Errors

	Q^2_{predict}	RMSE	MAE
TP	0.388	0.801	0.540
WP	0.367	0.819	0.522

Source: Data processed, 2025

The prediction errors, as indicated by the Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) values, fall within a moderate range. Collectively, these results demonstrate the model's meaningful predictive capability, thereby bolstering its external validity and practical utility.

The hypothesized structural relationships were tested using bootstrapping with 5,000 subsamples. As presented in Table 9, all three direct paths in the model are statistically significant ($T > 1.96$; $p < 0.05$), confirming the proposed relationships.

Table 9. Structural Path Estimates of Direct Relationships in the Hypothesized Model

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
IC -> TP	0.315	0.299	0.093	3.380	0.001
IC -> WP	-0.621	-0.631	0.061	10.235	0.000
WP -> TP	-0.512	-0.533	0.087	5.891	0.000

Source: Data processed, 2025

Table 10. Coefficients and Hypothesis Testing Results for Direct Effects (Path Coefficients, t-values, and p-values)

Relation	Original Sample (O)	T Statistics	P Values	Interpretation
IC → TP	0.315	3.380	0.001	Significant, positive
IC → WP	-0.621	10.235	0.000	Significant, negative
WP → TP	-0.512	5.891	0.000	Significant, negative

Source: Data processed, 2025

The positive and significant path from Interpersonal Conflict to Task Performance (IC to TP: $\beta = 0.315$; $p = 0.001$) suggests that, within the controlled professional environment of healthcare settings, conflict may function as constructive task conflict that ultimately enhances performance through rigorous clinical debate and information scrutiny. Conversely, the strong negative relationship between Interpersonal Conflict and Workplace Deviance (IC to WP: $\beta = -0.621$; $p < 0.001$) indicates that higher levels of conflict are associated with reduced deviant behavior. This counterintuitive finding aligns with the "discipline-locked context effect," where organizational controls and professional norms become activated during conflict episodes, thereby suppressing deviant responses.

The significant negative path from Workplace Deviance to Task Performance (WP to TP: $\beta = -0.512$; $p < 0.001$) confirms that deviant behaviors consistently undermine physicians' task performance, regardless of the conflict context.

The pattern of these relationships, specifically, the negative IC to WP path combined with the negative WP to TP path establishes the foundation for a complementary mediation effect, where the indirect effect of conflict on performance through reduced deviance is positive ($\beta_{ind} = 0.318$). Structural Model Assessment: Hypothesis Testing Summary.

The results of the structural model analysis and hypothesis testing are presented in Table 11. All three direct paths in the model are statistically significant, though with unexpected directional relationships for two hypotheses.

Table 11. Structural Model Results (Direct Effects): Estimates, t-values, and p-values

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics ((O/STDEV))	P values
IC -> TP	0.315	0.299	0.093	3.380	0.001
IC -> WP	-0.621	-0.631	0.061	10.235	0.000
WP -> TP	-0.512	-0.533	0.087	5.891	0.000

Source: Data processed, 2025

Contrary to the initial hypotheses but consistent with the discipline-locked context of healthcare organizations, interpersonal conflict shows a significant positive relationship with task performance (IC to TP: $\beta = 0.315$; $p = 0.001$), leading to the rejection of H_1 . Similarly, interpersonal conflict demonstrates a strong negative association with workplace deviance (IC to WP: $\beta = -0.621$; $p < 0.001$), resulting in the rejection of H_2 .

The significant negative relationship between workplace deviance and task performance (WP to TP: $\beta = -0.512$; $p < 0.001$) confirms the detrimental effect of deviant behaviors on performance. Most importantly, the mediation hypothesis (H_4) is supported, with a significant positive indirect effect ($\beta_{ind} = 0.318$; $p < 0.001$). This complementary mediation occurs because both constituent paths (IC to WP and WP to TP) are negative, resulting in a

positive indirect effect that reinforces the direct positive effect of conflict on performance. The overall model demonstrates moderate explanatory power, accounting for 56.1% of the variance in task performance ($R^2 = 0.561$) and 38.5% of the variance in workplace deviance ($R^2 = 0.385$).

The results of the bootstrapping analysis confirm that all structural paths in the model are statistically significant, as evidenced by 95% confidence intervals that do not include zero. The path coefficients, their confidence intervals, and the model's explanatory power are summarized below.

Table 12. Bootstrapped 95% Confidence Intervals for Structural Path Estimates

Relationship	Original sample (O)	Sample mean (M)	2.5%	97.5%
IC -> TP	0.315	0.299	0.120	0.479
IC -> WP	-0.621	-0.631	-0.750	-0.513
WP -> TP	-0.512	-0.533	-0.696	-0.362

Source: Data processed, 2025

The effects of IC on WP ($\beta = -0.621$; 95% CI $[-0.750, -0.513]$) is entirely negative, stable and significant, implying that higher interpersonal conflict is associated with lower workplace deviance. The effects of WP on TP ($\beta = -0.512$; 95% CI $[-0.696, -0.362]$) is also entirely negative, stable and significant, confirming workplace deviance has a significant negative effect on task performance. The effects of IC on TP ($\beta = 0.315$; 95% CI $[0.120, 0.479]$) is positive and significant. Because all CIs exclude zero, the structural paths are precise and robust, supporting the interpretation that WP mediates the effects of IC to TP relationship. A positive effect of IC on TP association can arise when conflict is predominantly task conflict and the organization maintains strong psychological safety and collaborative norms.

The model demonstrates substantial explanatory power, explaining 56.1% of the variance in Task Performance (TP) and 38.5% of the variance in Workplace Deviance (WP). Furthermore, the model exhibits strong out-of-sample predictive relevance, as indicated by the positive Q^2 predict values for both TP ($Q^2 = 0.388$) and WP ($Q^2 = 0.367$). The pattern of results specifically, a significant negative effect of IC on WP and a significant negative effect of WP on TP supports the interpretation that Workplace Deviance acts as a mediator in the relationship between Interpersonal Conflict and Task Performance. The positive direct effect from IC on TP suggests a complex relationship, potentially indicating that the conflict measured is more task-oriented and occurs within a context of strong collaborative norms. The mediation test result ($\beta_{\text{indirect}} = 0.318$, $p < 0.001$) confirms that Workplace Deviance (WP) significantly mediates the relationship between Interpersonal Conflict (IC) and Task Performance (TP). Given that both the direct effect (IC to TP) and the indirect effect are significant, this establishes a partial mediation.

Table 14. Indirect Effect and Mediation Test Results (IC \rightarrow WP \rightarrow TP)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
IC -> WP -> TP	0.318	0.338	0.071	4.499	0.000

Source: Data processed, 2025

The overall model explains a substantial portion of the variance in the endogenous constructs, with R^2 values of 0.561 for Task Performance (TP) and 0.385 for Workplace Deviance (WP). The model's practical credibility is strengthened by its out-of-sample predictive relevance, as indicated by positive Q^2 predict values for both TP (0.388) and WP (0.367).

These findings directly address the three objectives of this study. First, the positive and significant IC on TP path ($\beta = 0.315$) confirms that interpersonal conflict does not invariably harm physicians' task performance. When conflict stays focused on clinical (task) substance, it functions as a cognitive stimulus, sharpening diagnostic reasoning and strengthening interprofessional coordination. Second, the negative IC on WP and WP on TP paths reveal a key behavioral mechanism among physicians: in tightly supervised clinical environments, conflict triggers greater procedural compliance and work visibility, thereby suppressing deviance and protecting performance. Third, the significant indirect effect supports a model of complementary mediation, showing that conflict enhances performance both directly and indirectly by channeling team energy into disciplined processes while reducing the space for deviant behavior. This coherent framework lays the groundwork for a detailed examination of each pathway.

The positive and significant IC on TP path ($\beta = 0.315$) indicates that interpersonal conflict (IC) exerts a meaningful effect on physicians' task performance (TP). This positive coefficient shows that interpersonal conflict in medical workplaces is not always detrimental; under certain conditions it can stimulate better task execution. A plausible explanation lies in the presence of task conflict, distinct from relationship conflict, where disagreements about patient management prompt physicians to work more meticulously, prepare stronger clinical arguments, and improve decision quality. As reported by (de Wit et al., 2012), task conflict does not necessarily become harmful and can even benefit performance, provided it does not spill over into relationship conflict and occurs within a climate that supports open discussion. This positive direction aligns with literature showing that task conflict can enhance performance when it is kept distinct from relationship conflict and is supported by psychological safety and collaborative norms. In such contexts, clinical disagreement drives tighter diagnostic reasoning, guideline review, and coordination, thereby improving task performance (de Wit et al., 2012; Ilies et al., 2011).

The interpretation of these findings has a strong theoretical basis from two perspectives. First, consistent with Conflict Management Theory (Abunemeh, 2024), conflict can be beneficial when managed functionally. Through proper identification and regulation by enriching information diversity, clarifying medical assumptions, and opening constructive dialogue spaces, thus improving decision quality. Second, from the perspective of Social Exchange Theory (Blau, 2017), challenging interactions trigger positive reciprocity through increased effort, careful data presentation, and willingness to mutually validate clinical findings, serving as a social investment to preserve professional reputation and trust. The consistency of this finding is reinforced by empirical evidence in medical settings showing that task conflict can improve diagnostic accuracy when accompanied by effective communication clarification, confirmation, and two-way feedback and correction mechanisms (de Wit et al., 2012; Ilies et al., 2011). Thus, the positive coefficient in this study is not anomalous but reflects the reality of clinical practice operating within established systemic boundaries and professional norms.

The negative and significant IC on WP coefficient ($\beta = -0.621$) suggests that, in the clinical settings studied, higher interpersonal conflict is associated with lower workplace deviance. Rather than interpreting this as a universal reversal of the conflict–deviance relationship, the finding is more plausibly explained by the governance characteristics of healthcare organizations. Clinical work is embedded in strong professional norms, high peer visibility, and formal accountability mechanisms (e.g., SOPs, case discussions, audits, and committee oversight). These mechanisms can increase the perceived costs of deviant responses during periods of interpersonal friction, thereby encouraging greater self-regulation and procedural compliance.

The predominance of senior physicians in the sample may help explain this pattern. From Social Exchange Theory (Blau, 2017), senior physicians tend to place greater value on professional reputation, collegial trust, and long-term relational capital. In situations of interpersonal tension, they may therefore be more likely to respond with behaviors that signal professionalism such as adhering more closely to procedures and maintaining performance rather than engaging in deviant acts that could harm professional standing and working relationships. This interpretation is consistent with the idea that individuals invest in cooperative conduct when future reciprocity and reputational returns are salient (Cropanzano & Mitchell, 2005).

In parallel, Conservation of Resources Theory (Hobfoll, 1989), provides a complementary explanation. Interpersonal conflict can be experienced as a threat to key resources (time, emotional energy, cognitive focus, and professional standing). When resource loss is salient, individuals tend to adopt loss-minimizing strategies. In governance-rich clinical environments, deviant behaviors are comparatively high-risk because they can be traced through documentation systems, audits, and peer review. Under these conditions, stricter adherence to routines and SOPs may represent a lower risk strategy that both conserves resources and reduces exposure to sanctions. Taken together, SET and COR converge on a consistent implication in this setting: when reputational stakes and accountability are salient, conflict may be associated with tighter procedural compliance rather than increased deviance. This pattern stands in contrast to evidence in non-medical sectors where interpersonal conflict more consistently predicts higher deviance from Kundi et al. (2023). The difference may reflect contextual variation in professional control and accountability. In many general organizational settings, emerging conflict is not always counterbalanced by tightly institutionalized oversight, which may leave more opportunity for counterproductive reactions to manifest as deviant behavior.

By contrast, healthcare organizations typically operate under formalized governance structures that heighten observability and accountability, including routine case review processes, audit trails, and committee-based oversight. Under such conditions, the perceived costs of deviance during conflict episodes may increase, which can dampen the likelihood of deviant responses. Accordingly, the present findings should be interpreted as specifying plausible boundary conditions, particularly governance strength and professional control, under which the conflict deviance relationship may differ from patterns reported in non-medical contexts.

The strong negative WP on TP path ($\beta = -0.512$; $p < 0.001$) indicates that workplace deviance is associated with lower physician task performance. This is consistent with the view that deviations from expected professional and organizational standards can disrupt workflow reliability, information continuity, and coordination in team-based clinical work. In practice,

several forms of everyday deviance may plausibly contribute to performance impairment. First, delayed documentation can weaken the timeliness of clinical information, complicate coordination, and increase rework for other team members. Second, withholding or delaying important updates can reduce shared situational awareness, particularly in fast-moving clinical contexts. Third, selective or incomplete communication can weaken closed-loop communication and reduce coordination quality. Collectively, these behaviors are consistent with the negative association observed between deviance and task performance in this sample. Finally, the significant indirect effect IC on WP on TP ($\beta = 0.318$) indicates complementary partial mediation. Because both IC on WP and WP on TP are negative, the indirect pathway is positive, suggesting that conflict is associated with higher performance partly through its association with reduced deviance. Substantively, this pattern is most consistent with an interpretation in which conflict episodes increase procedural visibility and accountability, thereby constraining deviant responses and supporting task execution. However, to avoid overgeneralization, this interpretation should be bounded to contexts where governance mechanisms are strong and where interpersonal conflict is predominantly task-focused rather than relationally hostile. Under these conditions, conflict may be more likely to be channeled into structured review, procedural adherence, and performance protective behaviors, while workplace deviance remains consistently detrimental to task performance.

This study has several limitations. First, the cross sectional design restricts causal inference and does not establish temporal ordering among interpersonal conflict, workplace deviance, and task performance. Second, the use of self reported measures collected from a single survey source may introduce common method variance and social desirability bias, particularly for deviance-related items. Third, the purposive sampling strategy and the focus on physicians in Surabaya may limit generalizability to other regions and health systems. In addition, because the distribution of respondents across facility types was not recorded in sufficient detail, the study cannot rigorously test whether structural relationships differ across public hospitals, private hospitals, and *puskesmas*. Finally, the conflict measure likely captures a blend of task focused disagreement (clinical/procedural differences) and affect-laden interpersonal tension; future work should explicitly separate task conflict from relationship conflict to improve construct clarity.

Despite these limitations, several results support analytic credibility within the study scope. The measurement model demonstrated satisfactory indicator reliability and convergent/discriminant validity, the structural paths were supported by bootstrapped confidence intervals excluding zero, and the model showed meaningful explanatory and out of sample predictive relevance for the endogenous constructs (R^2 and Q^2_{predict}). These points should be interpreted as evidence of internal consistency in this dataset, not as proof of causal mechanisms.

The findings suggest actionable implications for clinical governance and team functioning. First, healthcare organizations should provide structured training that helps clinicians distinguish task conflict from relationship conflict, use neutral clinical language, and escalate disagreements into data based discussion rather than personal attribution. Second, routine forums (e.g., daily huddles, case discussions, morbidity mortality reviews where appropriate) can be formalized to channel disagreements into structured review, guideline alignment, and role clarification. Third, a psychologically safe incident reporting and response process should be strengthened so destructive behaviors can be addressed promptly and fairly, with clear follow-up pathways involving supervisory and professional committees. Fourth,

organizations can reduce opportunities for everyday deviance by increasing procedural visibility through simple monitoring systems (e.g., documentation timeliness indicators, closed-loop communication checks) paired with feedback and coaching rather than punitive escalation as the default.

This study contributes to the conflict performance literature by suggesting that governance strength and professional accountability may function as boundary conditions that shape how conflict relates to deviance and performance in healthcare teams. In governance-rich environments, the perceived costs of deviance (auditability, peer visibility, reputational stakes) may discourage counterproductive responses during conflict episodes, making procedural compliance more likely. This does not overturn prior findings from non-medical settings; rather, it refines them by specifying contextual conditions under which conflict-related reactions may differ.

Future studies should (i) use longitudinal or time-lagged designs to better examine temporal ordering and mediation mechanisms; (ii) incorporate multi-source data (e.g., supervisor ratings, peer reports, objective documentation metrics) to reduce single-source bias in deviance and performance measurement; (iii) conduct qualitative or mixed-method studies to clarify how clinicians interpret “conflict” and how governance mechanisms operate in daily practice; and (iv) compare sites with varying governance strength to test whether the conflict deviance relationship changes systematically across contexts.

CONCLUSIONS

In this sample of physicians, workplace deviance was consistently associated with lower task performance, while interpersonal conflict showed a pattern consistent with context-dependent dynamics in governance-rich clinical environments. These findings suggest that conflict is not uniformly detrimental; its implications may depend on how disagreement is structured, observed, and managed within professional accountability systems. Strengthening governance routines, psychological safety, and communication discipline remains central to protecting task performance and minimizing deviance in team-based clinical work.

REFERENCES

- Abunemeh, S. (2024). Investigating The Impact Of Conflict Management Approaches On Organizational Productivity In Healthcare Settings: A Qualitative Exploration. *Open Journal Of Social Sciences*, 12(11), 322–335. <https://doi.org/10.4236/jss.2024.1211023>
- Atwiine, J., Atukunda, G., Mwesigye, J., & Asimire, D. (2024). Job Conditions And Performance Of Health Centre Iv Workers In Selected Districts Of South Western Uganda: A Descriptive Cross-Sectional Study. [Sjhr]. In *Student's Journal Of Health Research Africa* (Vol. 5). <https://doi.org/10.51168/Sjhrafrica.V5i6.1164>
- Beenish Khan, & Amir Azam. (2022). The Impact Of Workplace Interpersonal Conflict On Job Performance, Job Depression And Turnover Intention. *Siasat*, 7(2), 149–159. <https://doi.org/10.33258/Siasat.V7i2.118>
- Ben Natan, M. (2025). Workplace Incivility In Hospitals: A Significant Barrier To Patient Safety And Care Quality. *Evidence Based Nursing*, 28(4), 194–194. <https://doi.org/10.1136/Ebnurs-2024-104078>
- Blau, Peter. (2017). *Exchange And Power In Social Life*. Taylor And Francis.
- Calderwood, C., Gabriel, A. S., Ten Brummelhuis, L. L., Rosen, C. C., & Rost, E. A. (2021). Understanding The Relationship Between Prior To End-Of-Workday Physical Activity And

- Work–Life Balance: A Within-Person Approach. *Journal Of Applied Psychology*, 106(8), 1239–1249. <https://doi.org/10.1037/Apl0000829>
- Claramita, M., Arininta, N., Fathonah, Y., Kartika, S., Prabandari, Y. S., & Pramantara, I. D. P. (2020). A Partnership-Oriented And Culturally-Sensitive Communication Style Of Doctors Can Impact The Health Outcomes Of Patients With Chronic Illnesses In Indonesia. *Patient Education And Counseling*, 103(2), 292–300. <https://doi.org/10.1016/J.Pec.2019.08.033>
- Cropanzano, R., & Mitchell, M. S. (2005). Social Exchange Theory: An Interdisciplinary Review. *Journal Of Management*, 31(6), 874–900. <https://doi.org/10.1177/0149206305279602>
- Cullati, S., Bochatay, N., Maître, F., Laroche, T., Muller-Juge, V., Blondon, K. S., Junod Perron, N., Bajwa, N. M., Viet Vu, N., Kim, S., Savoldelli, G. L., Hudelson, P., Chopard, P., & Nendaz, M. R. (2019). When Team Conflicts Threaten Quality Of Care: A Study Of Health Care Professionals’ Experiences And Perceptions. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes*, 3(1), 43–51. <https://doi.org/10.1016/J.Mayocpiqo.2018.11.003>
- De Wit, F. R. C., Greer, L. L., & Jehn, K. A. (2012). The Paradox Of Intragroup Conflict: A Meta-Analysis. *Journal Of Applied Psychology*, 97(2), 360–390. <https://doi.org/10.1037/A0024844>
- Dewi, F. S. P., Prayetni, P., & Antoro, B. (2025). Faktor-Faktor Yang Mempengaruhi Konflik Pada Tenaga Kesehatan Di Rs Aka Medika Sribhawono Kabupaten Lampung Timur Tahun 2024. *Journal Of Education Technology Information Social Sciences And Health*, 4(1), 198–210. <https://doi.org/10.57235/Jetish.V4i1.3887>
- Dinas Kesehatan. (2023, November 3). *Mulai November 2023, Puskesmas Surabaya Buka Layanan 24 Jam*. Dinas Kesehatan.
- Ekawati, F. M., & Claramita, M. (2021). Indonesian General Practitioners’ Experience Of Practicing In Primary Care Under The Implementation Of Universal Health Coverage Scheme (Jkn). *Journal Of Primary Care & Community Health*, 12. <https://doi.org/10.1177/21501327211023707>
- Fairchild, J., Legrand, A., Bentzinger, J. R., & Pfeiffer, K. (2025). Information Sharing And Psychological Safety In Virtual Teams. In *Cultivating Creative Collaboration In Student Virtual Teams In Higher Education* (Pp. 235–268). Igi Global Scientific Publishing. <https://doi.org/10.4018/979-8-3373-0375-8.Ch008>
- Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (Pls-Sem) Using R*. Springer International Publishing. <https://doi.org/10.1007/978-3-030-80519-7>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When To Use And How To Report The Results Of Pls-Sem. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/Ebr-11-2018-0203>
- Hobfoll, S. E. (1989). Conservation Of Resources: A New Attempt At Conceptualizing Stress. *American Psychologist*, 44(3), 513–524. <https://doi.org/10.1037/0003-066x.44.3.513>
- Ilies, R., Johnson, M. D., Judge, T. A., & Keeney, J. (2011). A Within-Individual Study Of Interpersonal Conflict As A Work Stressor: Dispositional And Situational Moderators. *Journal Of Organizational Behavior*, 32(1), 44–64. <https://doi.org/10.1002/Job.677>
- Kock, N., & Hadaya, P. (2018). Minimum Sample Size Estimation In Pls-Sem: The Inverse Square Root And Gamma-Exponential Methods. *Information Systems Journal*, 28(1), 227–261. <https://doi.org/10.1111/Isj.12131>
- Krijgsheld, M., Tummers, L. G., & Scheepers, F. E. (2022). Job Performance In Healthcare: A Systematic Review. *Bmc Health Services Research*, 22(1), 149. <https://doi.org/10.1186/S12913-021-07357-5>
- Kumar, M. (2025). Psychological Safety In Modern Workplaces: Exploring Key Drivers And Outcomes From Recent Research. *Research Review International Journal Of Multidisciplinary*, 10(7), 228–233. <https://doi.org/10.31305/Rrijm.2025.V10.N7.027>

- Kundi, Y. M., & Badar, K. (2021). Interpersonal Conflict And Counterproductive Work Behavior: The Moderating Roles Of Emotional Intelligence And Gender. *International Journal Of Conflict Management*, 2021, 10. <https://doi.org/10.1108/Jic-11-2020-0375>
- Kundi, Y. M., Badar, K., Sarfraz, M., & Ashraf, N. (2023). Interpersonal Conflict As A Barrier To Task Performance: The Mediating Role Of Workplace Deviance And The Moderating Role Of Emotional Intelligence. *International Journal Of Conflict Management*, 34(1), 104–124. <https://doi.org/10.1108/Ijcm-05-2022-0093>
- Kusuma, M. W., Herawati, F., Setiasih, S., & Yulia, R. (2021). Persepsi Tenaga Kesehatan Dalam Praktik Kolaborasi Interprofesional Di Rumah Sakit Di Banyuwangi. *Media Kesehatan Masyarakat Indonesia*, 20(2), 106–113. <https://doi.org/10.14710/Mkmi.20.2.106-113>
- Lee, S. E., Seo, J., & Macphee, M. (2024). Effects Of Workplace Incivility And Workload On Nurses' Work Attitude: The Mediating Effect Of Burnout. *International Nursing Review*, 71(4), 1080–1087. <https://doi.org/10.1111/Inr.12974>
- Lewis, C. (2023). The Impact Of Interprofessional Incivility On Medical Performance, Service And Patient Care: A Systematic Review. *Future Healthcare Journal*, 10(1), 69–77. <https://doi.org/10.7861/Fhj.2022-0092>
- Margaret, O. J., & Isaac, O. (2025). Workplace Conflict On Employees' Performance And Organizational Productivity, A Case Study Of Tororo General Hospital. *Metropolitan Journal Of Social And Educational Research*, 4(1), 398–409. <https://www.journals.miu.ac.ug>
- Mayende, T. S., & Musenze, I. A. (2018). Ethical Leadership And Staff Retention: The Moderating Role Of Job Resources In Uganda's Healthcare Sector. *Sa Journal Of Industrial Psychology*, 44. <https://doi.org/10.4102/Sajip.V44i0.1531>
- Mccarthy, J. M., Truxillo, D. M., Bauer, T. N., Erdogan, B., Shao, Y., Wang, M., Liff, J., & Gardner, C. (2021). Distressed And Distracted By Covid-19 During High-Stakes Virtual Interviews: The Role Of Job Interview Anxiety On Performance And Reactions. *Journal Of Applied Psychology*, 106(8), 1103–1117. <https://doi.org/10.1037/Apl0000943>
- Mutumba, W. W., Webb, W. N., & Kyambade, M. (2025). Ethical Behaviour And Values-Based Approach In Uganda's Healthcare Facility: A Framework Towards Enhancing Healthcare Performance. *Journal Of Work-Applied Management*. <https://doi.org/10.1108/Jwam-08-2024-0117>
- Noerchoidah, N., Mochklas, M., Indriyani, R., & Arianto, B. (2022). The Mediating Effect Of Knowledge Sharing On Interpersonal Trust And Job Satisfaction Of Creative Industry In East Java. *Matrik: Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 87. <https://doi.org/10.24843/Matrik:Jmbk.2022.V16.I01.P07>
- Qiu, F., Li, Y., Zhou, C., Sun, Y., Li, J., & Tang, J. (2025). Network Analysis Of Interpersonal Conflict, Emotional Exhaustion And Psychological Distress Among Mental Health Nurses In The Workplace: A Cross-Sectional Survey. *Frontiers In Public Health*, 13. <https://doi.org/10.3389/Fpubh.2025.1559351>
- Rauf, S., Hidayah, N., Amal, A. A., & Gani, N. F. (2020). Factors Causes Of Conflict Among Nurses At Rsu Haji Makassar. *Indonesian Journal Of Nursing Health Science Issn*, 5(2), 142–148.
- Rina, Abdullah, R., & Ahri, R. A. (2019). Pengaruh Beban Kerja Dan Konflik Interpersonal Terhadap Kinerja Perawat Di Rumah Sakit Islam Faisal Makassar Tahun 2018. *Jurnal Ilmiah Kesehatan Diagnosis*, 14, 2302–2531.
- Robinson, S. L., & Bennett, R. J. (1995). A Typology Of Deviant Workplace Behaviors: A Multidimensional Scaling Study. *Academy Of Management Journal*, 38(2), 555–572. <https://doi.org/10.2307/256693>
- Roth, P. L., Bobko, P., Shan, G. (“Jack”), Roth, R. W., Ferrise, E., & Thatcher, J. B. (2024). Doxing, Political Affiliation, And Type Of Information: Effects On Suspicion, Perceived Similarity, And Hiring-Related Judgments. *Journal Of Applied Psychology*, 109(5), 730–754. <https://doi.org/10.1037/Apl0001153>

- Shumba, C. S., Kielmann, K., & Witter, S. (2017). Health Workers' Perceptions Of Private-Not-For-Profit Health Facilities' Organizational Culture And Its Influence On Retention In Uganda. *Bmc Health Services Research*, 17(1), 809. <https://doi.org/10.1186/s12913-017-2763-5>
- Sudiyani, N. N., & Rihayana, I. G. (2025). Unveiling The Influence Of Perceived Organizational Support On Work Engagement And Organizational Citizenship Behavior. *Matrik: Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 18(2). <https://doi.org/10.24843/Matrik:Jmbk.2024.V18.I02.P05>
- Walker, G. B., & Daniels, S. E. (2019). Collaboration In Environmental Conflict Management And Decision-Making: Comparing Best Practices With Insights From Collaborative Learning Work. *Frontiers In Communication*, 4. <https://doi.org/10.3389/fcomm.2019.00002>
- Yusoff, H. M., Ahmad, H., Ismail, H., Reffin, N., Chan, D., Kusnin, F., Bahari, N., Baharudin, H., Aris, A., Shen, H. Z., & Rahman, M. A. (2023). Contemporary Evidence Of Workplace Violence Against The Primary Healthcare Workforce Worldwide: A Systematic Review. In *Human Resources For Health* (Vol. 21, Number 1). Biomed Central Ltd. <https://doi.org/10.1186/s12960-023-00868-8>
- Zeng, X., Zou, C., Tao, H., Huang, X., Lei, Y., Xiao, C., Peng, T., Shen, J., & Wong, W. K. (2025). Workplace Violence Against Primary Care Physicians In Chengdu, China: A Cross-Sectional Survey. *Journal Of Primary Care And Community Health*, 16. <https://doi.org/10.1177/21501319251318837>
- Zhang, M. J., Law, K. S., & Wang, L. (2021). The Risks And Benefits Of Initiating Change At Work: Social Consequences For Proactive Employees Who Take Charge. *Personnel Psychology*, 74(4), 721–750. <https://doi.org/10.1111/peps.12423>



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 19 No. 1, 2026 (February), 41-53



HOW WORKLOAD AND ROLE CONFLICT AFFECT EMPLOYEE PERFORMANCE THROUGH BURNOUT: A MEDIATION ANALYSIS



SINTA 2

Rd. Roro Anggraini Soemadi¹⁾, Hendra Galuh Febrianto²⁾,
Mikail Kartaloğlu³⁾, Amalia Indah Fitriana⁴⁾, Riski Ulan Sari⁵⁾

^{1,2,4,5} Faculty of Economics and Business, Universitas Muhammadiyah Tangerang, Banten, Indonesia

³ Erciyes University, Kayseri, Turkey

Email: anggraini.soemadi@yahoo.co.id

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p03>

ABSTRACT

Burnout syndrome, characterized by emotional exhaustion, depersonalization, and reduced personal accomplishment, often arises from excessive workload and unresolved role conflict. This study examines the impact of workload and role conflict on employee performance, with burnout as a mediating variable. A quantitative approach was employed, using questionnaires distributed to service sector employees, and data were analyzed through Structural Equation Modeling (SEM). Results reveal that workload and role conflict significantly and negatively affect employee performance. Both factors also positively contribute to burnout, which in turn reduces performance. The findings confirm that burnout mediates the relationship between workload and role conflict with employee performance. This study highlights the importance of managing workload proportionally and addressing role conflict to prevent burnout. Theoretical contributions enrich human resource management literature, while practical implications provide organizations with strategic insights to design interventions that enhance workplace well-being and sustain optimal employee performance.

Keywords: burnout; employee performance; mediation; role conflict; workload.

INTRODUCTION

In many private companies engaged in management consulting, research, and multimedia rental, work patterns are generally similar to those found in other organizations. Working and operating hours typically start at 08.00 WIB and end at 16.30 WIB. However, this schedule does not always apply to employees in the multimedia rental division, who often need to work overtime when equipment must be prepared and installed at event locations, including devices such as laptops, LED TVs, and related items. A key issue is that overtime is not consistently included in formal overtime criteria, except under certain agreements. This situation can make employees feel very tired because they start work in the morning and at night may still be required to remain on standby at the event location. As a result, employees may become less focused and less attentive, which can lead to cases of lost goods or fines imposed by event organizers due to employee negligence. Worse, when such incidents occur, responsibility is often placed entirely on the employee. This context highlights the importance of examining work arrangements and overtime policies in order to reduce operational risks and improve employee performance and accountability. For the various problems above, most

of which are related to the psychology of human resources, this study is supported by the theory of psychological contract (Joel et al., 2022).

Nafei and Abdelaal (2022) stating that organizations and companies that do not have psychological contracts with their employees may not be effective and will not be considered a company. If the organization or company does not have a psychological contract with the employee who is a member of the joint committee, either verbally or in writing, this can be considered a weakness of the psychological contract (Aybar & Cark, 2023). Violation of unintended implications of various negative, unexpected, unintended consequences (Ismail et al., 2022). Workers who perceive a breach of psychological contract can develop depression, anxiety, perceived injustice, and emotional exhaustion (Firdaus, Sakinah, & Anisah, 2021). Feelings of depression, emotional exhaustion and other burnout syndrome occurs, which are different from stress. Workers who suffer from burnout syndrome will feel demotivated and hopeless (Edú-Valsania, Laguía, & Moriano, 2022).

This research focuses on the relationship between workload and role conflicts in relation to employee burnout and performance. Previous research by Hidayat et al. (2024) found that workload has a positive impact on burnout but not significantly. However, another study conducted by Mumtaz and Purwanto (2024) Putri et al. (2024) and Saputro et al. (2020) found that workload also has a positive and significant effect on burnout. Further research by Herdiana and Sary (2023) and Syihabudhin et al. (2020) found that workload negatively impacts employee performance. However, this opinion contradicts the findings of research conducted by Wulantika et al. (2023), which found that workload has a significant positive influence on employee performance.

In addition to being influenced by workload, burnout is also indicated to be influenced by role conflict. This is supported by research conducted by Sagita (2023) and Zulhapiz (2023b) which states that role conflict has a positive and significant influence on burnout. However, the opinions of the two researchers are different from the research findings presented by Kristina et al., (2020) who in their research found that role conflict has a positive but not significant effect on burnout. Role conflict in addition to influencing burnout, is empirically also proven to have an influence on employee performance. The empirical study that supports this connection is research conducted by Sijabat & Martanto (2024) and Wahyuni et al. (2020) which states that role conflict has a negative and significant influence on employee performance. This contradicts the research conducted by Fahmi et al. (2019) where in their research it was found that role conflict has a positive and significant influence on employee performance.

In the context of contemporary work dynamics, workload and role conflict have become increasingly prominent phenomena and have a significant impact on employee performance (Kundi et al., 2021; Shifana & Sathyamoorthi, 2025; Wahana et al., 2024). Recent studies show that excessive work pressure not only has a direct effect on decreased productivity, but also triggers the emergence of burnout as a chronic fatigue condition that is multidimensional in nature (Conceoc & Palma-moreira, 2025; Gaspar et al., 2025; Schaufeli, 2020). However, the mechanisms that explain the relationship between workload, role conflicts, and performance through burnout as mediator variables are still not fully revealed, especially in the context of organizations in Indonesia (Frederica & Wahyuningtyas, 2025; Hidayat et al., 2024a; Purwanti et al., 2022).

Although a number of studies have confirmed the influence of workload and role conflicts on employee performance through burnout as mediating variables, the mechanism of these relationships is still not fully revealed in the organizational context in Indonesia. The

limitations of previous research lie mainly in the lack of empirical evidence highlighting the dynamics of the collectivist work culture, as well as the lack of the application of rigorous mediation analysis in local studies. This shows that there is a research space that needs to be filled to strengthen theoretical understanding while making a practical contribution to the development of human resource management policies in Indonesia. Then it can also be explained the empirical gap in the effect of burnout on employee performance. In a study developed by Imaningtyas et al. (2024), Prasetya et al. (2021) and Setyanti et al. (2022) which stated that burnout has a negative and significant influence on employee performance. This contradicts the research conducted by Sarah & Eryandra (2024) where in her research it was found that burnout has a positive and significant influence on employee performance.

This research was conducted at PT. Gift of Mandiri Consultant with the main objective of analyzing the direct influence of workload and role conflicts on employee performance through a survey-based quantitative approach. The analysis is directed at sectors that have a high level of work stress, so that the results of the research are expected to be able to provide an empirical picture that is relevant to the organizational context in Indonesia. Furthermore, this study examines the role of burnout as a mediating variable using path modeling through Partial Least Squares Structural Equation Modeling (PLS-SEM), including the assessment of the specific dimensions of burnout based on the Maslach Burnout Inventory (MBI) instrument that has been validated across cultures. From a theoretical perspective, this study contributes to the development of the Job Demands-Resources (JD-R) and Conservation of Resources (COR) models by presenting empirical evidence from non-Western contexts, as well as answering methodological criticisms in work stress mediation research. Practically, this study produces evidence-based recommendations for human resource management, in the form of psychological intervention strategies and job redesign that are in accordance with the characteristics of Indonesia's work culture and in line with the principles of decent work.

This study contributes to organizational behavior and human resource management by addressing three critical gaps. First, it enriches the theoretical discourse by clarifying the mediating mechanism of burnout within a collectivist work culture, offering insights into how cultural context shapes employee responses to workload and role conflict. Second, it advances methodological rigor through the application of Structural Equation Modeling (SEM) for mediation analysis, thereby strengthening empirical evidence in Indonesian organizational research. Third, it provides practical implications by informing the design of workplace well-being policies that are contextually relevant to the Indonesian service sector. These contributions are particularly significant in the post-pandemic era, where organizations face heightened challenges in sustaining employee performance and resilience. Collectively, the study bridges theoretical, methodological, and practical perspectives, positioning burnout management as a strategic priority for organizational sustainability.

The proposed model was developed based on several theories and concepts, which are described as follows: First, Psychological Contract. Psychological contracts are the understanding or understanding of a person's actions and responsibilities towards a company, which can be influenced by the consequences or consequences of two legal principles that are developed implicitly or explicitly (Joel et al., 2022; Tomprou & Lee, 2022). Second, Employee Performance; is a continuous process in the assignment of tasks and work organized by an organization, focusing on how employees carry out their duties and work performance, in accordance with company policies (Harsono & Syahrinullah, 2023; V. M. Putri & Simatupang, 2023). The dimensions of Employee Performance in this study are as follows (Riana & Anatan, 2023; D. P. Saputra & Noor, 2022): a) Work Performance. Work

performance refers to the ability to perform tasks effectively, influenced by factors such as differences in individual performance, knowledge, skills, and abilities. Work performance indicators include (Riana & Anatan, 2023; Yudithia et al., 2019): Clear task specifications and Ability to perform tasks outside of work. b). Contextual Performance. Contextual performance is the behavior that shapes the organizational, social, and psychological to carry out performance activities and processes in tasks, has emerged as an important aspect of overall job performance (Riana & Anatan, 2023). Indicators of the performance of this task include: Follow organizational rules or procedures and Dedication to the job.

Third, Counterproductive Work Behavior, employee behavior that is contrary to the formal interest of the agency being worked, which is defined as intentional or unintentional activities on the part of individuals and other people to the organization, which include (Riana & Anatan, 2023): Misuse of company goods for personal gain and Work is not in accordance with the specified working hours. Fourth, Burnout. Beer et al. (2022) define burnout as emotional distress, depersonalization, and decreased personal performance that can occur between individuals. Burnout affects employee performance because of its relationship with his or her organization. Freudenberger, a psychologist, first described burnout in 1974. This leads to intense work, stress, and worry, leaving employees feeling overwhelmed and in need of motivation (Edú-Valsania et al., 2022). Yeboah et al. (2022) also define burnout as a common factor that affects employee performance. The burnout indicators in this study refer to the research of Beer et al. (2022), Which consist of emotional fatigue, Depersonalization, and A decline in personal achievement. Emotional fatigue refers to feeling tired and disappointed during work. This can be measured by a person experiencing high levels of emotional fatigue due to work and physical fatigue that is not easy to control. Depersonalization is the development of a person's sense of self and lack of self-perception in their work environment. It is a psychological process that helps individuals maintain their identity and reduce their reluctance to work. It is measured by the fact that a person views their work as a job and believes that some work makes them feel like they are being targeted by certain problems. Lastly, decline in personal achievement is a feeling of dissatisfaction with oneself, work and life. Maslach (in Beer et al., 2022) states that the decline in personal achievement is caused by feelings of guilt for doing others around him negatively.

Fifth, Workload, an important aspect for every organization because it affects employee performance (Asteya, 2023). Workload analysis uses standard tools to identify personal needs and differences between capacity and employability. According to Radinka & Kustini (2023), workload is a group or activity that must be chosen by an organization at a certain time and will affect employee performance. Xi et al. (2023) use physical and mental work habits as indicators, with physical demands including physical demands and effort, and mental demands including mental demands, temporal demands, frustration, and performance, using NASA-TLX in the study of Saputra & Herwanto (2023) as follows. Physical demand refers to physical activities that are necessary for work, such as control, direction, and other tasks. The question asks whether the work is stable, fast, or slow? Effort is the physical and mental effort required to achieve the desired level of performance. The instructions used in this context include a variety of mental and physical actions for optimal results. Mental demands refer to the mental and perceptual activities necessary to work, such as preparing, working, and regulating the pace of work, whether easy or difficult, long or short, or quiet. Temporal demand refers to the amount of work done over a period of time, such as the speed and efficiency of the job, or the duration of the work. The level of frustration, which includes insecurity, hopelessness, stuck, disrupted, is a measure of a worker's workload when

experiencing insecurity, hopelessness, mistakes, stress, and upset. Performance refers to a person's significant success in their work and the areas in which they excel. The question is, which areas of a worker perform well in their work?

Sixth, Role Conflict. Role chaos occurs when the overall expectation of the role does not state the tasks. This occurs due to a set of behaviors expected of a person occupying a specific position within an organization or group, including the task or job itself, the description of the task, and rules and standards (Sagita, 2023). Sijabat & Martanto (2024) and Noviansyah et al. (2022) face role conflict is a situation in which individuals are faced with different role expectations. Enderwita et al. (2022) mention role conflicts in individuals that occur when an individual faces uncertainty about the work he or she expects to perform, various job requests contradict each other. The role conflict in this study has four dimensions, according to Rizzo et al. (1970) in Ahmad et al., (2021) which are considered as fundamental aspects are as follows: Person-role conflict is a form of conflict that arises when differences of opinion impact the values, interests, and needs of the individual in a conflict, with indicators indicating whether the parts should be different and whether the work is done according to agreed norms. Inter-role conflict is a form of conflict that arises when a person has to follow rules or procedures to perform a task, or perform a task without permission from another worker to perform it Intersender conflict is a form of conflict that arises when one of the parties has to deal with a different individual, the indicator of which is the existence of a dispute between two or more people in a company, or a dispute in a certain field. Intrasender conflict is a form of conflict that arises as a result of information disambiguation, the indicators of which are a) lack of resources and materials necessary to carry out tasks; and b) failure to perform duties.

Based on the explanation above, it can be explained that the analysis model formed is as follows:

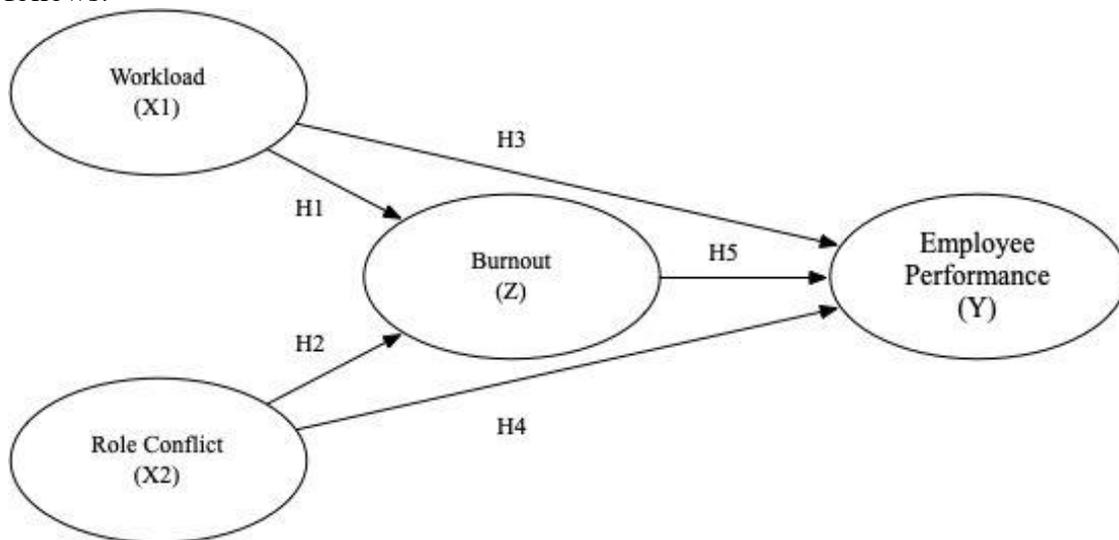


Figure 1. Analysis Model

Source: Authors, 2025

Hypotheses:

H1: Workload is positively related to burnout.

H2: Role conflict is positively related to burnout.

H3: Burnout is negatively related to employee performance.

H4: Burnout mediates the relationship between workload and employee performance.

H5: Burnout mediates the relationship between role conflict and employee performance.

METHODS

This study uses a quantitative approach with the object of PT. Karunia Mandiri Consultan. The sampling technique is total sampling (census) so that the entire population of 187 employees is used as respondents. Primary data was obtained through an online questionnaire distributed by the company's HRD department. The research instruments consisted of: (1) workload and role conflicts adapted from scales tested in organizational psychology, (2) burnout measured by the Maslach Burnout Inventory (MBI), and (3) employee performance measured by the Individual Work Performance Questionnaire (IWPQ). Instrument validation was carried out through an expert judgment, limited trial, and Confirmatory Factor Analysis (CFA) analysis. Reliability is tested with Cronbach's alpha and composite reliability, with all constructs meeting the minimum recommended limits.

Data analysis using covariance-based Structural Equation Modeling (SEM) with the AMOS program, is suitable for theoretical testing and model confirmation. The hypothesis test was carried out with a Critical Ratio (CR) and a probability value compared to the set critical value. Model feasibility is evaluated through several suitability indices, such as Chi-square/df, RMSEA, CFI, and TLI.

RESULT AND DISCUSSION

The structural model was evaluated using covariance-based structural equation modeling (CB-SEM). Based on the data analysis, the resulting path diagram and standardized estimates are presented in Figure 2

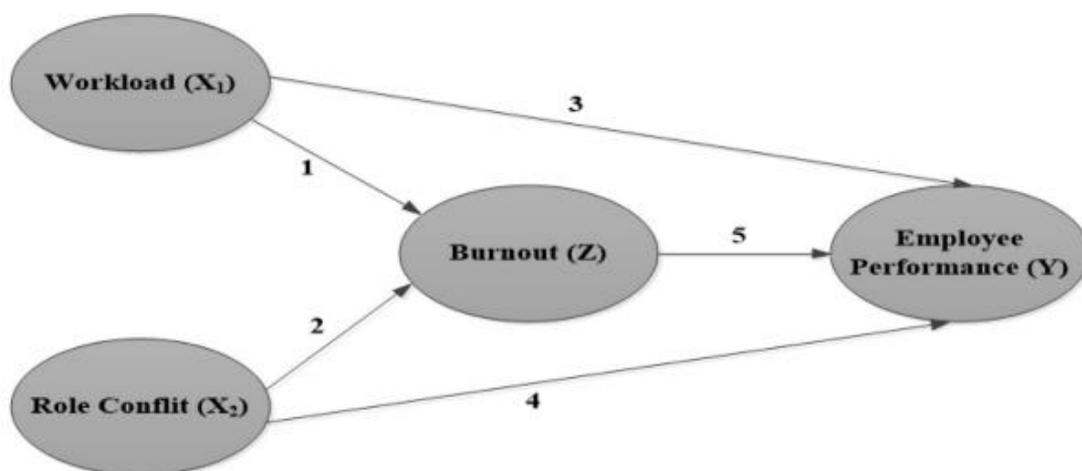


Figure 2. Analysis Model

Source: Data processed, 2025

Based on the test results, the results are summarized in each connection between the pathways and presented in table 1 as follows:

Table 1. SEM-AMOS Test Results

			Estimate	S.E	C.R	P
Workload	⇒	Burnout	.130	.063	7.162	.000
Role Conflict	⇒	Burnout	.166	.091	11.930	.000
Workload	⇒	Employee Performance	-.027	.072	8.513	.004
Role Conflict	⇒	Employee Performance	-.047	.040	13.672	.002
Burnout	⇒	Employee Performance	-.234	.378	9.646	.006

Source: Data processed, 2025

Based on tables 1 and 2, it can be seen that all hypotheses proposed can be proven to be true where the analysis carried out will be shown as follows: The results of the study found that workload has a positive and significant influence on burnout, because it is a difference in work capacity or ability to perform work tasks. The workload, a group or activity chosen by an organization, also affects employee performance (Radinka & Kustini, 2023).

Table 2. Summary of Hypothesis Test Results

	Hipotesis		Predicted Sign	Standardize Regression Coefficient	Conclusion	
H ₁	Workload	⇒	burnout	+	.230	Accepted
H ₂	Role conflict	⇒	burnout	+	.352	Accepted
H ₃	Workload	⇒	employee performance	-	.434	Accepted
H ₄	Role conflict	⇒	employee performance	-	.521	Accepted
H ₅	Burnout	⇒	employee performance	-	.344	Accepted

Sumber: Data processed, 2025

Burnout is a psychological condition characterized by emotional distress, depersonalization, and decreased performance, thereby increasing stress and demotivation at work (Firdaus et al., 2021; Mumtaz & Purwanto, 2024). In contrast to stress, which requires motivation and effort, and can be triggered by various factors (Edú-Valsania et al., 2022). Workloads that increase the capacity and effectiveness of employees who work for long periods of time can make them physically and mentally tired, causing fatigue and decreased motivation at work. Burnout is a common factor that influences the decision to leave an organization (Yeboah, Arboh, & Quainoo, 2022). The negative impact of workload on burnout is the result of the company's inability to manage its workload. The study of Hidayat et al. (2024) is different from the findings of Mumtaz & Purwanto, (2024); Putri et al. (2024) & Saputro et al. (2020) show that workload has a positive impact on burnout but not significantly.

Role conflicts have a positive and significant impact on burnout because it is a psychological problem faced by employees, causing a negative work environment and professional motivation (Ahmad et al., 2021). Research by Sagita (2023) and Zuhapiz

(2023b) found that role conflicts have a positive impact on burnout, but in contrast to Kristina et al., (2020) who found that role conflicts do not have a significant effect on burnout.

Workload has a significant negative influence on employee performance, because it is different from the capacity or ability to work with the required working time. Workload, a group or activity that an organization must allocate over a period of time, also affects employee performance (Radinka & Kustini, 2023). Mental and physical workloads are different which allows for excessive energy and work stress. Workload can be seen from both physical and mental workloads. An employee who is overweight or has weak physical abilities will certainly result in an obstacle in work, and the employee will feel sick because of a job (Sweden, 2023). Budiarto et al. (2023) completed work due to too many workloads that had to be completed and then limited time, capacity, and ability of employees were not in accordance with the demands of the workload that had to be done.

Individual performance is the output of a worker, both qualitatively and quantitatively, based on his or her work standards (Simatupang & Safitri, 2023). Modern organizations must understand the role and process of work in understanding psychological contracts and the role of legal norms (De Clercq, 2024). Joel et al. (2022) explain that psychological contracts are individual attitudes towards legal obligations that can be fulfilled, based on a perspective or misunderstanding of legal principles. If a company can treat its employees like their own and provide jobs according to their job description, then they can also work totally. Herdiana & Sary (2023), Wijaya & Eppang, (2021) and Syihabudhin et al. (2020) found that workload has a negative impact on employee performance, while Wulantika et al. (2023) found that workload has a positive effect on employee performance. However, there are conflicting findings.

Role conflicts have a significant negative influence on employee performance as shown by a Standardized Regression Coefficient of 0.521 and a probability of 0.006 and a negative significance. Ahmad et al. (2021) explained that this conflict occurs when management provides inappropriate guidance to employees due to time and resource limitations. The company also avoids the process of growth and development in product production, thus leading to employee experimentation based on their experience to improve the company's performance.

Psychological contract theory states that organizations face challenges in implementing directives or committees, either implicitly or explicitly. This can lead to negative consequences such as counterproductive work, lack of commitment, and potential negative impacts on the organization, especially employee performance (Ismail et al., 2022). Research by Sijabat & Martanto (2024) and Wahyuni et al. (2020) found that role conflicts have a negative impact on employee performance, while Fahmi et al. (2019) found that role conflicts have a positive impact on employee performance. Both studies highlight the importance of understanding the relationship between role conflict and performance.

Burnout, a psychological problem that causes emotional and physical stress, negatively impacts employee performance, with a Standardize Regression Coefficient of 0.344 and a probability of 0.004 indicating a significant and negative influence on employee performance. The impact on working hours, productivity, and personal confidence is significant (Edú-Valsania et al., 2022).

When a worker is given a position in a company because of his authority and position, they can work more effectively and feel belonged. However, if they are not held accountable for their actions, they could experience burnout' syndrome. Burnout syndrome is a negative process resulting from negative changes in behavior and work stress during stressful periods

(Ozturk, 2020). This can lead to feelings of anger, pessimism, and difficulty at work, as well as a lack of creativity (Jeikawati et al., 2022). This can also trigger other work-related problems that cause similar problems. Therefore, it is very important for individuals to manage fatigue effectively. Research by Imaningtyas et al. (2024), Prasetya et al. (2021) and Setyanti et al. (2022) suggests that burnout has a negative impact on employee performance, while Sarah & Eryandra (2024) refutes this by stating that burnout has a positive impact on employee performance.

Then in testing the role of burnout in mediating the influence of workload on employee performance, it is calculated through a sobel test calculator. By looking at the one sided probability value (0.002) and the two-sided probability (0.005) which are all smaller than the required critical value, which is 0.05, it can be concluded that the burnout variable is proven to be a mediating variable in the effect of workload on employee performance. Furthermore, burnout in mediating the influence of role conflict on employee performance. By looking at the one sided probability (0.009) and the two sided probability (0.018), which are all smaller than the required critical value, which is 0.05, it can be concluded that the burnout variable is proven to be a mediating variable in the influence of role conflict on employee performance.

CONCLUSIONS

The results of the study show that workload and role conflicts have a significant negative effect on employee performance. Burnout has been shown to play a mediator role explaining how excessive work demands and conflicting roles not only degrade performance directly, but also indirectly through increased psychological fatigue. These findings strengthen the theoretical framework of Job Demands Resources (JDR) and Conservation of Resources (COR) with empirical evidence from the context of collectivist culture in Indonesia. In practical terms, the results of the study confirm the importance of organizations to manage workloads proportionately, clarify roles and responsibilities, and provide adequate psychological resources to prevent burnout. These efforts not only maintain employee well-being, but also support the productivity and sustainability of the organization in a competitive work environment. The limitations of this study include cross sectional design that limits causal inference, the use of self report data that has the potential to cause bias, and the scope of the sample that is limited to one sector. Future research is suggested using longitudinal designs, involving multi-source data, as well as expanding cross industry and cultural contexts. In addition, the exploration of moderation variables such as social support, leadership style, and personal resilience can provide a more comprehensive understanding of the mechanisms of work stress.

REFERENCES

- Ahmad, J., Zahid, S., Wahid, F. F., Ali, S., & Ali, S. (2021). Impact of Role Conflict and Role Ambiguity on Job Satisfaction the Mediating Effect of Job Stress and Moderating Effect of Islamic Work Ethics. *European Journal of Business and Management Research*, 6(4), 41–50.
- Asteya, P. G. (2023). Job stress mediate : Workload on performance. *World Journal of Advanced Research and Reviews*, 19(02), 1335–1343.
- Aybar, S., & Cark, O. (2023). Paternalistic Leadership And Work Engagement In The Innovative Service Industry: The Mediating Role Of Psychological Contract. *Marketing*

- and Management of Innovations*, 14(4), 32–47.
- Beer, L. T. De, Schaufeli, W. B., & Bakker, A. B. (2022). Investigating the validity of the short form Burnout Assessment Tool: A job demands-resources approach. *African Journal of Psychological Assessment*, 12(4), 1–9.
- Budiarto, E., Rahayu, S., & Robain, W. (2023). *The Effect Of Employee Engagement And Workload On Employee Performance Mediated By Employee Work Satisfaction In The Administration Section Of*. 2(8), 2329–2346.
- Conceço, A., & Palma-moreira, A. (2025). The Relationship Between Occupational Stress , Burnout , and Perceived Performance : The Moderating Role of Work Regime. *Administrative Sciences*, 15.
- De Clercq, D. (2024). Psychological contract breaches, plans to quit, and destructive voice behavior: Catalytic effects of proactive personality. *European Management Journal*, 10(3), 1–11. <https://doi.org/10.1016/j.emj.2024.03.010>
- Edú-Valsania, S., Laguía, A., & Moriano, J. A. (2022). Burnout : A Review of Theory and Measurement. *International Journal of Environmental Research and Public Health*, 1(9), 1–27.
- Endarwita, Yuliza, M., & Resita, P. (2022). Pengaruh Beban Kerja dan Konflik Peran Terhadap Kinerja Karyawan PT. Primatama Mulia Jaya (PMJ) Kecamatan Kinali Kabupaten Pasaman Barat. *Edunomika*, 06(01), 1–12.
- Fahmi, H. K., Musnadi, S., & Nadirsyah, N. (2019). Role Conflict, Self Efficacy, Employees' Performance and Organizational Performance. *Journal of Accounting Research, Organization and Economics*, 2(1), 31–40. <https://doi.org/10.24815/jaroe.v2i1.13013>
- Firdaus, A., Sakinah, & Anisah. (2021). Burnout Syndrome dan Faktor-Faktor yang Mempengaruhinya. *Jurnal Ilmiah Ekonomi Dan Bisnis*, 12(2), 257–260. <https://doi.org/10.33087/eksis.v12i2.277>
- Frederica, A., & Wahyuningtyas, R. (2025). The Influence of Work Environment and Workload on Employee Performance at PT ABC. *International Journal of Scientific and Management Research*, 8(3), 48–60.
- Gaspar, T., Guedes, F. B., Cerqueira, A., Baban, A., Rus, C., Matos, M. G., & Gaspar, T. (2025). Burnout as a multidimensional phenomenon : how can workplaces be healthy environments ? *Journal of Public Health*, 33(12), 2591–2604. <https://doi.org/10.1007/s10389-024-02223-0>
- Harsono, N. D., & Syahrinullah. (2023). Pengaruh Employee Engagement Terhadap Organizational Citizenship Behavior (OCB) Dan Kinerja Karyawan Pada Bank Mandiri The Effect of Employee Engagement on Organizational Citizenship Behavior (OCB) and Employee Performance at Bank Mandiri KCP Mandiri. *Forecasting: Jurnal Ilmiah Ilmu Manajemen*, 2(1), 219–227.
- Herdiana, R. P., & Sary, F. P. (2023). How workload impacts the employee performance and how work stress acts as a mediating variable in shoes manufacturing company. *International Journal of Research in Business and Social Science*, 12(5), 164–173. <https://doi.org/10.20525/ijrbs.v12i5.2756>
- Hidayat, R., Mardiyana, & Ronayah. (2024a). Determinant of Burnout and the Implication Toward Job Satisfaction. *Jurnal Manajemen Pelayanan Publik*, 08(02).
- Hidayat, R., Mardiyana, & Ronayah. (2024b). Determinant Of Burnout And The Implication Toward Job Satisfaction. *Jurnal Manajemen Pelayanan Publik*, 08(02), 307–322.
- Imaningtyas, G., Brahmasari, I. A., Aju, I., & Ratih, B. (2024). The Influences of

- Competence, Burnout and Work-Life Balance on Organizational Citizenship Behavior and Performance of Employees PT. Haleyora Power ULP Bangkalan. *International Journal of Economics (IJEK)*, 3(1), 123–135. <https://doi.org/10.55299/ijec.v3i1.578>
- Ismail, F., Juhari, N., Al-Qershi, N. A. M., Imran, M., Alhosani, A. A. H., & Jaes, L. (2022). The Effect of Psychological Contract Towards Deviant Behavior, Employee Engagement and Employee Commitment. *Webology*, 19(2), 4665–4685.
- Jeikawati, Sari, D. P., Suprihatin, Faradila, & Arifin, S. (2022). Gambaran Burnout Syndrome Pada Tenaga Kesehatan Di RSUD Kota Palangka Raya. *Borneo Journal Of Medical Laboratory Technology*, 5(2), 351–357.
- Joel, O., Moses, C., Igbinoba, E., Maxwell, O., Salau, O., & Omobolanle, A. (2022). Psychological contract and employee performance in the Nigerian manufacturing industry: A conceptual review. In *Academy of Entrepreneurship Journal* (Vol. 28, Issue 1).
- Kristina, A. D., Loekmono, J. T. L., & Setyorini, S. (2020). The effect of role conflict on academic burnout of undergraduate Economics students. *International Journal of Research in Counseling and Education*, 4(2), 98. <https://doi.org/10.24036/00333za0002>
- Kundi, Y. M., Université, A., & Aboramadan, M. (2021). Employee psychological well-being and job performance: exploring mediating and moderating mechanisms. *International Journal of Organizational Analysis*, 29(3), 736–754. <https://doi.org/10.1108/IJOA-05-2020-2204>
- Mumtaz, A., & Purwanto, S. (2024). Relationship Between Workload to the Level of Burnout in Employees of PT Baba Rafi International. *East Asian Journal of Multidisciplinary Research (EAJMR)*, 3(1), 421–428.
- Nafei, W., & Abdelaal, E. (2022). The Influence of Authentic Leadership on the Performance of Tasks. *Journal of the Faculty of Tourism and Hotels-University of Sadat City*, 12(1), 56. <https://doi.org/10.5296/ijhrs.v12i1.19472>
- Noviansyah, Soleh, A., & Nengsih, M. K. (2022). Pengaruh Konflik Peran dan Lingkungan Kerja terhadap Kinerja Karyawan pada Bank Bengkulu Cabang Pembantu Mega Mall. *Jurnal Ekombis Review – Jurnal Ilmiah Ekonomi Dan Bisnis*, 10(1), 223–228.
- Ozturk, Y. E. (2020). A Theoretical Review of Burnout Syndrome and Perspectives on Burnout Models. *Bussecon Review of Social Sciences*, 2(4), 26–35.
- Prasetya, A., Khairunnisa, H., & Aziz, A. L. (2021). The Effect of Work Stress and Burnout on Job Satisfaction and Employee Performance: A Test of Conservation of Resources Theory. *Proceedings of the 3rd Annual International Conference on Public and Business Administration (AICoBPA 2020)*, 191(AICoBPA 2020), 74–79.
- Purwanti, I., Suyanto, U. Y., & Abadi, M. D. (2022). The Role of Burnout between Workload, Work Stress, and Employee Performance: Mediation Model. *KnE Social Sciences*, 2022, 70–85. <https://doi.org/10.18502/kss.v7i10.11210>
- Putri, G. S., Lukito, H., & Rivai, H. A. (2024). The Effect of Workload and Work Ambiguity on Burnout with Work Stress as a Mediation Variable. *Mantik Journal*, 8(1), 2685–4236.
- Putri, V. M., & Simatupang, F. S. (2023). Pengaruh Good Corporate Governance terhadap Firm Value dengan Return On Assets sebagai Variabel Intervening pada Perusahaan Sektor Makanan Dan Minuman Di BEI Periode Tahun 2018 – 2021. *Oikos: Jurnal Kajian Pendidikan Ekonomi Dan Ilmu Ekonomi*, 8(1), 197–211.
- Radinka, N., & Kustini, K. (2023). The Influence of Workload and Job Satisfaction on Employee Turnover Intention at Pt. Umc Suzuki. *The Influence of Workload and Job Satisfaction on Employee Turnover Intention at Pt. Umc Suzuki*, 06(10), 5160–5164.

- <https://doi.org/10.47191/jefms/v6-i10-48>
- Riana, N., & Anatan, L. (2023). Pengaruh Servant Leadership Terhadap Job Performance Melalui Employee Engagement Di Interkultural Edukasi Partner Bandung. *Derivatif: Jurnal Manajemen*, 17(1), 135–153.
- Rizzo, J. R., House, R. J., & Lirtzman, S. I. (1970). Role Conflict and Ambiguity in Complex Organizations. *Administrative Science Quarterly*, 15(2), 150–163.
- Sagita, H. (2023). Pengaruh Role Conflict, Role Ambiguity Terhadap Burnout dan Dampaknya Terhadap Kualitas Audit (Studi Empiris pada Kantor Akuntan Publik di Wilayah Jakarta Selatan). *Jurnal Sosial Dan Sains*, 3(8), 780–794. <https://doi.org/10.59188/jurnalsosains.v3i8.983>
- Saputra, D. P., & Noor, J. (2022). Influence of Empowering Leadership to Employee Performance of Bank in Indonesia: Mediating Role of Trust in Manager Datep Purwa Saputra 1) , Juliansyah Noor 2) 1. *MATRIK: Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 16(1), 127–140.
- Saputra, M. A. F., & Herwanto, D. (2023). Analisis Beban Kerja Mental Menggunakan Metode NASA-TLX pada Divisi Produksi Perusahaan Empat Perdana Carton. *Jurnal Serambi Engineering*, 8(1), 4521–4528.
- Saputro, R., Aima, M. H., & Elmi, F. (2020). Effect Of Work Stress and Work Load on Burnout and Its Implementation In Turnover Intention Erha Clinic Branch Office (Bogor, Depok and Mangga Besar). *Dinasti International Journal of Management Science*, 1(3), 262–280. <https://doi.org/10.31933/DIJMS>
- Sarah, H. S., & Eryandra, A. (2024). The Effect of Work Engagement and Burnout to Retail Employee Performance. *JMKSP (Jurnal Manajemen, Kepemimpinan, Dan Supervisi Pendidikan)*, 9(1), 588–601. <https://doi.org/10.31851/jmksp.v9i1.14852>
- Schaufeli, W. B. (2020). Burnout Assessment Tool (BAT)— Development , Validity , and Reliability. *International Journal of Environmental Research and Public Health*, 17(1), 1–21.
- Setyanti, S. W. L. H., Fagastia, I. R., & Sudarsih. (2022). The Influence of Burnout, Workload and Work-Life Balance on Employee Performance. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, 5(1), 1573–1580.
- Shifana, T. A., & Sathyamoorthi, V. (2025). Employee Psychological Well-Being: A Systematic Literature Review. *Journal of Informatics Education and Research*, 5(2), 4364–4386.
- Sijabat, R., & Martanto, I. (2024). The Impact of Role Conflict on Employee Performance with Work Stress as An Intervening. *Jurnal Economia*, 20(2), 236–245.
- Simatupang, Y. C., & Safitri, W. (2023). Pengaruh Servant Leadership dan Disiplin Kerja terhadap Kinerja Karyawan melalui Employee Engagement Sebagai Mediasi. *Jurnal Ilmiah Manajemen Dan Bisnis*, 6(2), 583–592.
- Swedana, I. N. (2023). The Role Of Workload And Work Motivation In Influencing Performance Through Job Satisfaction. *Jurnal Manajemen*, 27(02), 401–427.
- Syihabudhin, S., Nora, E., Juariyah, L., Hariri, A., & Dhika, O. (2020). Effect of Workload on Employee Performance Through Work Life Balance at Ollino Garden Hotel Malang East Java. *Proceedings of the 3rd Asia Pacific Management Research Conference (APMRC 2019)*, 149(Apmrc 2019), 141–146. <https://doi.org/10.2991/aebmr.k.200812.025>
- Tomprou, M., & Lee, M. K. (2022). Employment relationships in algorithmic management: A psychological contract perspective. *Computers in Human Behavior*, 12(6), 1–12.

- <https://doi.org/10.1016/j.chb.2021.106997>
- Wahana, A., Setiadi, I. K., & Mulyantini, S. (2024). Analysis of The Effect of Workload , Role Conflict , Work Stress on Exit Intentions and Work Burnout. *Journal of Management, Economic and Financial*, 2(3), 64–71.
- Wahyuni, N., Musnadi, S., & Faisal. (2020). The Effect of Role Conflict and Workload on Employee Performance Mediated by Work Stress: Study on Aceh Financial Management Board. *International Journal of Scientific and Management Research*, 3(3), 106–116.
- Wijaya, D. H., & Eppang, B. M. (2021). The effect of technology development, leadership style and organization culture on employee performance. *MATRIK: Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 15(2).
- Wulantika, L., Ayusari, R. M., & Wittine, Z. (2023). Workload, Social Support and Burnout on Employee Performance. *Journal of Eastern European and Central Asian Research*, 10(1), 1–8. <https://doi.org/10.15549/jeecar.v10i1.1069>
- Xi, N., Chen, J., Gama, F., Riar, M., & Hamari, J. (2023). The Challenges of Entering the Metaverse : An Experiment on the Effect of Extended Reality on Workload. *Information Systems Frontiers*, 2(5), 659–680. <https://doi.org/10.1007/s10796-022-10244-x>
- Yeboah, E., Arboh, F., & Quainoo, E. A. (2022). Psychological Effects of Burnout Among Health Workers. *Journal of Clinical Images and Medical Case Reports*, 3(1), 1–7.
- Yudithia, Setiawan, R., & Mahadiansar. (2019). Mengukur Kinerja Individu Pegawai Rumah Sakit Umum Daerah Provinsi Kepulauan Riau. *Jurnal Masyarakat Maritim*, 3(1), 53–64.
- Zulhapiz, M. H. (2023). The Influence of Stress as a Mediator in the Relationship between Role Conflict and Burnout. *Jurnal Manajemen Universitas Bung Hatta*, 18(2), 281–292. <https://doi.org/10.37301/jmubh.v18i2.23267>



P-ISSN: [1978-2853](#)
E-ISSN: [2302-8890](#)

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 20 No. 1, 2026 (February), 54-72



COOPERATIVE AND FINANCIAL LITERACY ON COOPERATIVE PERFORMANCE: THE MEDIATING ROLE OF BUSINESS CAPABILITY

Dede Djuniardi¹⁾, Lili Karmela Fitriani²⁾, Neng Evi Kartika³⁾

^{1,2,3} Universitas Kuningan, West Java, Indonesia

Email: lili@uniku.ac.id



SINTA 2

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p04>

ABSTRACT

The aim of this study is to examine how cooperative literacy, financial literacy, and business capability influence cooperative performance in Indonesia, with a focus on West Java, where performance remains relatively low due to suboptimal managerial competence. A questionnaire was used to gather data, and it yielded analyzable responses from 581 respondents consisting of chairperson, secretary and treasurer cooperatives in West Java. The entire data processing by SEMPLS with WarpPLS software. This study finds that cooperative literacy, financial literacy and business capability have an impact on cooperative performance. Cooperative literacy has positive impact to business capability, but financial literacy is not. Then business capability can mediation to cooperative literacy but not for financial literacy. Cooperative management must improve their knowledge of cooperatives, financial management and business knowledge through training programs for cooperatives to flourish more effectively.

Keywords: cooperative literacy; financial literacy; business capability; cooperative performance.

INTRODUCTION

Academics and practitioners in the cooperative sector in Indonesia have long been interested in research on cooperative performance, which has been measured using a variety of performance proxies, including financial performance (Indra et al., 2021; Siregar, 2020; Utami & Darmawan, 2021) and member participation (Triwani et al., 2020). This earlier research demonstrates the existence of concerns in cooperative management that result in two problems, namely financial management and cooperative understanding. Cooperatives managers must be capable of running the cooperative in accordance with the cooperative primary principles. According to (Triwani et al., 2020) research, cooperative literacy improve cooperative performance. Meanwhile, research by (Sari & Purwanto, 2022) has found no substantial effect. Financial literacy is important to understand the basic economic concept needed to make saving and investment decision. It is more important to executive members of cooperative because they have to make complex financial decision besides day-to-day management. The research of Dito Rinaldo et al. (2025) found that the financial literacy level of Indonesian people is still very poor. And so the financial literacy has a positive impact on cooperative performance (Utami & Darmawan, 2021). In contrast to the research (Anggraini et al., 2023; Hamzah & Yusoff, 2025; Adang & Wulandari, 2026) which shows no impact.

Business capabilities, including innovation, dynamic collaboration and management competence have a significant impact on cooperative performance measures through growth of turnover, assets and net income. Strong capabilities enable cooperatives to adapt for services, capital and competition. That is why, in this study, we use business capabilities as a mediating variable.

To raise the volume of cooperative business growth, which in this case will become a separate competitiveness in progressing cooperatives, the demands of members are crucial. The Ministry of Cooperatives and SMEs publication data 2023 the number of active cooperatives has decreased over decade, from 229,448 units in 2014 to 130,119 units at the end of 2023, a reduction of 79,328 units and inactive cooperatives have been dissolved. Cooperatives management fails due to a number of issues, including cooperatives literacy, financial literacy and business capabilities. Managing cooperative necessitates extensive knowledge about cooperatives and the number of cooperatives is predicted to grow in tandem with the establishment of Merah Putih Cooperatives in all villages in Indonesia, which totals 83,000 villages, implying that the number of cooperatives will increase in response to the president's directive. Increasing the number of cooperatives without improving the capacity of their managers is extremely hazardous. This study examines the role of managers in developing cooperative literacy and financial literacy in cooperative management. The demand for cooperative resources with commercial capacity and capability would significantly fuel the establishment of cooperatives as the backbone of the national economy, as envisioned by Bung Hatta, Indonesia's cooperative father.

Table 1. Number of Cooperatives in Indonesia and West Java from 2021-2024

Year	Indonesia	West Java
2021	127,846	27,404
2022	130,354	27,417
2023	130,119	27,998
2024	131,617	29,096

Source: Data processed, 2025

West Java, being one of the provinces with the most active cooperatives in Indonesia, outperforms other provinces. This is why the research concentrates on West Java. The widespread expansion of cooperatives is expected to result in several failures in cooperative development. If all the demands of the members have been addressed in the cooperative, then strong competition will prevent consumers from looking for other options to do business outside the cooperative (Aristana et al., 2020). This is because human resources managing cooperatives lack the necessary expertise and experience. To improve comprehension of cooperative management in accordance with the values, guidelines, and 1945 Constitution, cooperative human resources are required. In order to provide better services to members, administrators, one of the cooperatives' key human resources responsible for driving success, must be able to increase members' ownership and consumer participation levels. This will enable cooperatives to become self-sufficient in terms of internal capital (Anasrulloh et al., 2021).

The primary objective of this study is to provide evidence that the poor performance of cooperatives can be attributed to the inadequate understanding of cooperative principles among non-professional cooperative management. Currently, cooperative has a poor image in the eyes of community, especially younger generation. Many cases of fraud are carry out by cooperatives such as fraudulent investment that is under the guise of cooperatives (Haryono

et al., 2021). According to BPS statistics from 2022, West Java has the second-highest number of cooperatives in Indonesia, following East Java. A large number of cooperatives in West Java have been closed due to mismanagement by cooperative administrators, which is why the research is focused on cooperatives in West Java. Cooperatives are formed with a sense of community, but this is frequently accompanied with a lack of understanding of cooperatives. Cooperatives, being commercial entities, share management characteristics with corporations; thus, the business capabilities of cooperative managers become critical to the cooperative's performance success. As a result, in this study, business capability serves as a mediator. This study will look at the relation between cooperative literacy and financial literacy and how it affects the performance of cooperatives, as well as the role that business competencies play as a mediating factor. This study aims to highlight these gaps in knowledge and emphasize the need for targeted educational and training programs that can enhance the capabilities of cooperative managers. By addressing these shortcomings, cooperatives can improve their overall performance, ensuring long-term sustainability and greater economic contributions to their communities (Hamzah & Yusoff, 2025).

This study based on resources based view and institutional theory. While RBV explains how cooperative and financial literacy can improve business capability and cooperative performance. Institutional theory explains why understanding cooperative principles and norms is critical for achieving legitimacy and longterm performance. Institutional theory identifies the main construct institutional as institutional entrepreneurship (Risi et al., 2023). This issue stems from a low level of cooperative literacy, which results in ineffective decision-making and operational inefficiencies. Many cooperative managers still struggle to grasp the fundamental concepts of direct business management, commonly referred to as business aptitude. Additionally, their lack of financial literacy further exacerbates the problem, as they are unable to implement sound financial strategies necessary for sustaining and growing their cooperatives. Without a solid understanding of these key area's cooperative literacy, business capability, and financial literacy. Cooperative management teams face significant challenges in maintaining operational efficiency and financial stability.

The urgency of this research is to offer the answers required to boost cooperative management's capability and competence to produce cooperative individuals who comprehend the significance of cooperatives in daily life. Business capabilities is the capacity to convey a company's identity to clients and workers. the capacity to outperform rivals by utilizing a collection of corporate characteristics that are distinctive and challenging for rivals to mimic. We use Business Capability as a mediating variabel cause to Cooperative performance there the managers should have a business orientation to success. To drive the growth and long-term success of cooperative enterprises, it is essential for management to be both financially literate and financially aware. This means not only understanding basic financial concepts but also being able to apply them strategically in decision-making processes. As highlighted by Indra et al. (2021), equipping cooperative managers with the necessary financial knowledge and skills is a fundamental step toward improving overall cooperative performance and ensuring their competitiveness in the marketplace.

Cooperatives differ from individual businesses in that ownership is determined by members with equal voting rights, as opposed to individual businesses where ownership is determined by the size of the shares. The General Meeting of Shareholders (GMS) of corporations and the General Meeting of Members (RUA) of cooperatives are where the most important decisions are made. In cooperatives, members act as owners and turn over

management with the responsibility of running the business and social aspects of the cooperative. For cooperatives to be effective and compete with other commercial organizations, management and managers need to have a business sense.

A thorough understanding of cooperative management is essential for the growth and development of cooperatives. This knowledge, often referred to as cooperative literacy, plays a crucial role in ensuring that cooperatives operate effectively and sustainably. According to Sakdiyah et al. (2019), cooperative literacy encompasses all knowledge related to cooperatives and their associated functions. It is defined by the ability to recall, comprehend, and apply relevant information when making decisions and managing cooperative activities. By fostering cooperative literacy among managers and members, cooperatives can enhance their operational efficiency and long-term viability. A well-informed management team is better equipped to navigate challenges, implement strategic initiatives, and ensure that cooperative principles are upheld. Therefore, investing in cooperative education and training programs is vital for strengthening cooperative institutions and maximizing their economic and social contributions. Cooperative knowledge has no impact on cooperative performance, according to research by Sari & Purwanto (2022) on cooperatives in the Bantul district. According to research by (Sakdiyah et al., 2019) on KPRI in Banda Aceh City, the outcomes of cooperative knowledge on members have a substantial impact on cooperative performance.

According to institutional and organizational theory, a thorough understanding of organizational values and structures influences the organization's ability to perform its functions efficiently. Management of cooperatives with strong cooperatives literacy will be better equipped to manage resources, establish business strategies and implement business choices based on cooperative principles. Cooperative Literacy promote members to actively participate in cooperative business activities. Such engagement helps the cooperative strengthen its ability to manage business decisions, expand market network and provide higher quality services to members. As a result, cooperative literacy is expected to improve cooperatives business capability.

Cooperative literacy not only helps cooperatives improve their business capability, but it can also have a direct impact on cooperative performance. A thorough understanding of cooperative principles and values will lead to more transparent, participatory and accountable organizational management. This circumstance promotes better cooperative governance, which increases cooperative performance. Cooperative managers who are highly literately cooperative will have a better understanding of cooperatives goals as membership based economic entities. This knowledge promotes alignment between the cooperative commercial activities and its members interest, boosting the cooperative economic and social success. Thus, cooperative literacy is expected to have a positive effect on cooperative performance.

Modern humans need financial intelligence, specifically financial intelligence in managing their own finances. According to Klapper & Lusardi (2020) people need to be financially literate to make informed financial choices regarding saving, investing, borrowing and more. Financial literacy can be defined as financial knowledge with the aim of achieving wealth. According to Lusardi & Mitchell (2023) financial literacy is people knowledge of and ability to use fundamental financial concept in their economic decision making. The Indonesian National Strategy for Financial Literacy Handbook (2021) describes financial literacy as a set of procedures or actions aimed at boosting consumers' knowledge, self-assurance, and abilities so they can better handle their finances. Financial literacy is the capacity to manage your money so that you can grow and have a wealthier life in the future. Literacy is described as the capacity to understand; thus, it is the capacity to manage money.

According to data from the Financial Services Authority's (OJK) third National Financial Literacy and Inclusion Survey (SNLIK), the financial inclusion index in Indonesia was 76.19%, while the financial literacy index was 38.03%. This number has increased compared to the findings of the 2016 OJK survey, which showed a financial inclusion index of 67.8% and a financial literacy level of 29.7%. The survey's findings revealed an 8.33% rise in the general public's financial literacy. Financial literacy revolves around money in some way. This element entails understanding the various uses and forms of money as well as managing straightforward financial activities like payments for necessities, shopping, money values, bank cards, checks, bank accounts, and currencies. discusses key facets of financial literacy, such as improved planning and management of wealth over the long and short term, with a focus on knowledge and skills related to tracking income and expenses and making use of income and other resources to increase financial well-being. Financial literacy comprises several key components, including Money and Transactions, Financial Planning and Management, Risk and Profit, and the Financial Landscape. These elements collectively enable individuals to make informed financial decisions and manage their resources effectively. A critical aspect of financial literacy is the ability to identify and balance financial risks, which can be achieved through various means such as insurance and savings products.

Additionally, financial literacy involves understanding potential gains and losses across different financial contexts and products. This includes the ability to assess investment opportunities, navigate credit agreements with variable interest rates, and make strategic financial choices that align with long-term goals. By developing these skills, individuals and organizations, including cooperatives, can enhance their financial stability and resilience in an ever-changing economic environment. Knowing the characteristics and aspects of the financial world entails understanding the main effects of financial contracts, as well as the rights and obligations of consumers in financial markets and the broader financial environment. Understanding the effects of shifting economic conditions and societal policies, including interest rates and taxation, is also a part of this element. A competitive and stable economy will result from the promotion of financial literacy (Goyal & Kumar, 2021). Financial literacy has broad consequences for the health of the nation's economy. Indra et al. (2021) concluded that cooperative managers need to become more financially literate in order to improve financial performance. Their research focused on the implementation of financial literacy on cooperative performance. The sustainability of cooperatives is disrupted because managers and administrators still have a poor level of financial literacy. According to Utami & Darmawan (2021) financial literacy and cooperative performance in Buleleng, Bali, are positively correlated.

In the context of cooperatives, financial literacy plays a significant role in improving cooperatives business capabilities. Cooperative managers with strong financial literacy will be able to create accurate financial reports, effectively manage cash flow make sound investment and financial decisions. This will improve cooperative's ability to conduct its business activities. Furthermore, financial literacy improves the cooperative's ability to confront economic risks and changes in the business environment. Cooperative managers that have a solid financial understanding can develop more adaptable and sustainable business plan. Consequently, financial literacy is expected to improve cooperative business capability. Financial literacy improves cooperative performance by enabling greater financial management ability. Cooperative managers that are financially literate will be able optimize capital allocation, decrease financial risk and improve operational efficiency. This has remification for improving the cooperatives financial performance. Understanding financial

concepts also contributes to improved accountability and openness in cooperative management. This condition has the potential to boost member and stakeholder trust, so increasing the cooperatives long term sustainability. So, financial literacy has positive impact to cooperative performance.

For business organizations, maintaining their competitiveness in today's rapidly evolving market and business environment is a major challenge. Because of this, it's important to be able to foresee the direction of the market and have insight into both obvious and subtle client wants. The ideas of skills, competences, procedures, and resources are all intimately tied to the idea of business capabilities. Capability is the capacity to outperform rivals by utilizing a collection of commercial characteristics that are unique and challenging to duplicate. Business Capability arise in part of learning, from combining resources and from exploiting complementary assets (Teece, 2019). According to the viewpoints and definitions presented above, business capability play a significant part in a company's ability to run its operations successfully and outcompete its competitors. Performance across all businesses will be impacted by business capabilities. All companies with a business focus, whose success is backed by their managers' and executives' commercial acumen. Senior managers can understand the organization's business capabilities, which offer a holistic perspective. Furthermore, Ernita et al. (2020) emphasizes that comprehending capabilities requires entrepreneurial skill to active interaction with the environment and the effective use of additional resources. Capability, in this context, refers to a person capable of overseeing business opportunities, gathering whatever resources are needed and taking planned action to achieve success. In other word, the ability of a resource to create an impact on its surroundings through structured processes, the utilization of both tangible and intangible assets, and the development of valuable customer relationships. By leveraging these capabilities, organizations can enhance their adaptability, improve operational efficiency, and create long-term value. The ability to integrate various resources strategically enables businesses and cooperatives to remain competitive and responsive to changing market dynamics. This highlights the importance of continuous learning, innovation, and effective resource management in achieving sustainable growth. Many capabilities become embedded in routines and some reside with the top of management team (Teece, 2019).

According to the resource base theory, an organizations performance determined by its capacity to effectively and effectively manage its resources. Cooperative with strong business capabilities will be able to boost production, expand market and provide better service to their members. This ultimately has an impact on improving cooperative performance. Cooperative Performance measures cooperative achievements in both financial and non financial areas, such as cooperative growth, increasing member welfare and business sustainability. Thus, cooperative business capability determines its performance.

Cooperative literacy and financial literacy have a direct effect on cooperative performance but it also improves the business capability to carry out business tasks. A solid understanding of cooperative principles, governance and financial knowledge will inspire cooperative managers to create more effective business plan that suit the demand of its members. This improved understanding is evident in cooperative business capability, wich refers to its ability to run its operations professionally and effectively. Good business capability leads to improved cooperative performance. Hence, business capability is believed to be the mechanism behind how cooperative literacy and financial literacy might increase cooperative performance. In other word, business capability can mediate between cooperative literacy and financial literacy contributing to cooperative performance.

The outcomes of work activities or organizational activities that are influenced by different elements to achieve organizational goals within a specific time frame are known as organizational performance. The word "performance" is derived from "job performance" or "actual performance," and it refers to the organization's actual performance. The definition of organizational performance itself is the outcome of the organization's achievement of work in quality and quantity while carrying out its obligations in line with those delegated to it.

Cooperative performance measurements have been done using financial and non-financial ways internal and external aspects (Siregar, 2020), and a balanced score card (Wahyudi & Aini, 2020). In general, institutions (number of cooperatives per province, number of cooperatives per type or group of cooperatives, number of active and inactive cooperatives), membership, business volume, capital, assets, and the remaining results of operations are the performance of cooperatives that are measured to see the development or growth of cooperatives in Indonesia. In essence, these variables cannot be utilized to reflect accurately the contribution or function of cooperatives to national economic development. Similarly, the influence of cooperatives (cooperative effect) on enhancing the welfare of members or the community has not been reflected in the variables.

Three elements are identified by Das & Mishra (2019) as having an impact on organizational performance. First, individual determinants include a person's aptitudes, competencies, family history, professional experience, socioeconomic status, and demography. Second, psychological elements like motivation, attitude, personality, and role, as well as perception, role, and attitude. Finally, there are organizational elements, such as job design, leadership, operational systems, and procedures. This study adopts the perspective of managers and administrators who oversee cooperative operations, as their role is crucial in ensuring the success and sustainability of cooperatives. Effective administration and management are fundamental to the overall performance of these organizations, influencing decision-making, financial stability, and strategic growth. Wahyudi & Aini (2020) conducted research that specifically examined cooperatives from the viewpoint of their administrators and managers. Their study highlights the importance of leadership, governance, and managerial competence in enhancing cooperative efficiency and achieving long-term success. Understanding these perspectives provides valuable insights into the challenges and opportunities faced by cooperative leaders, reinforcing the need for continuous capacity building and professional development in cooperative management.

The study hypothesizes that cooperative literacy positively improves business capability and cooperative performance, and that financial literacy positively enhances business capability and improves cooperative performance. It also posits that business capability positively improves cooperative performance. In addition, the study proposes a mediation mechanism in which business capability mediates the effect of cooperative literacy on cooperative performance and the impact of financial literacy on cooperative performance.

METHODS

Cooperative management respondents in West Java, including chairmen, secretaries, and treasurers, participated in this study at cooperatives there. There were 581 responders in all consist of chairperson, secretary and treasurer cooperative in West Java Indonesia. A questionnaire with a scale of 1–10 was used to collect the data. The study's construct variables include cooperative literacy, financial literacy, business capability, and cooperative performance. Regression testing was done using PLS-SEM mediation analysis followed by

data analysis to verify the validity and reliability of the instrument. PLS-SEM provide a comprehensive overview of consideration and metrics required analysis and result reporting (Hair et al., 2019). This research utilized WarpPLS 8 for data analysis. Data collection was conducted using a questionnaire instrument designed to assess four key variables: Cooperative Literacy (X1), Financial Literacy (X2), Business Capability (M), and Cooperative Performance (Y). These variables were measured to evaluate their relationships and overall impact on cooperative success.

This research uses a quantitative approach with primary data collected through questionnaires. The object of this research is cooperatives management in West Java. The questionnaire uses Google Forms, which were sent to cooperatives in West Java on a scale of 1-10. The target number of respondents was 600, distributed among the cooperative management in West Java, and 581 respondents met the criteria to be processed in the data analysis. This shows a response rate of 96%. The respondents are the cooperative management, consisting of the Chairperson, Secretary, and Treasurer. The respondents in this study were between 25 and 60 years old and held various positions within cooperatives. The composition of their roles included 40.67% serving as Chairpersons, 37.72% as Secretaries, and 21.61% as Treasurers. Their educational backgrounds varied, with 10.62% having completed high school, 31.23% holding a diploma, 52.43% earning a bachelor's degree, and 5.72% possessing a master's degree. This diversity in roles and educational qualifications provides a well-rounded perspective on cooperative management in the region.

The respondents were selected from various districts across West Java, ensuring a representative sample of cooperative administrators. The sampling method used in this study was purposive sampling, specifically targeting cooperative managers. This approach was chosen to obtain insights from individuals who play a direct role in cooperative operations and decision-making. By focusing on these key stakeholders, the study aims to provide a comprehensive understanding of the challenges and opportunities faced by cooperative management in West Java.

The empirical model consists of two Structural Equations. The first equation models Business Capability as a function of Cooperative Literacy and Financial Literacy. The second equation models cooperative performance as a function of Cooperative Literacy, Financial Literacy and Business Capability. The form of the equation in this study is as follows:

$$BC = \beta_0 + \beta_1 CL + \beta_2 FL + \varepsilon_t \dots\dots\dots(1)$$

$$CP = \beta_0 + \beta_1 CL + \beta_2 FL + \beta_3 BC + \varepsilon_t \dots\dots\dots(2)$$

Note: CP denotes Cooperative Performance, BC denotes Business Capability, CL denotes Cooperative Literacy, FL denotes Financial Literacy, β_0 denotes intercept, and ε_t denotes error.

The distribution of the research sample shows that 581 responden spread across West Java. Data was gathered using a questionnaire distributed to active cooperative managers. The data is then processed using SemPLS with WarpPLS 8.0. WarpPLS is particularly advantageous in modelling complex and potentially non linear relationship and in detecting hidden patterns that may be overlooked by conventional linear PLS-SEM approaches. Therefore, it is suitable for exploratory and theory buiding research context. WarpPLS is also robust in handling relatively small to moderate sample size and does not require strict assumption of multivariate normality, making it appropriate for survey based data commonly found in cooperative and smal entreprise research context.

Variable using in this research are Cooperative Literacy (CL), Financial Literacy (FL) Business Capability (BC) and Cooperative Performance (CP). The quantity of indicators for each variable is as follows: There are six indicators for cooperative literacy, four for financial

literacy, five for business capability, and eleven for cooperative performance. Each indicator is measured on a 1-10 scale in the questionnaire. The model used to determine the relationship between latent variables and their indicators is referred to as the measurement model, also known as the outer model.

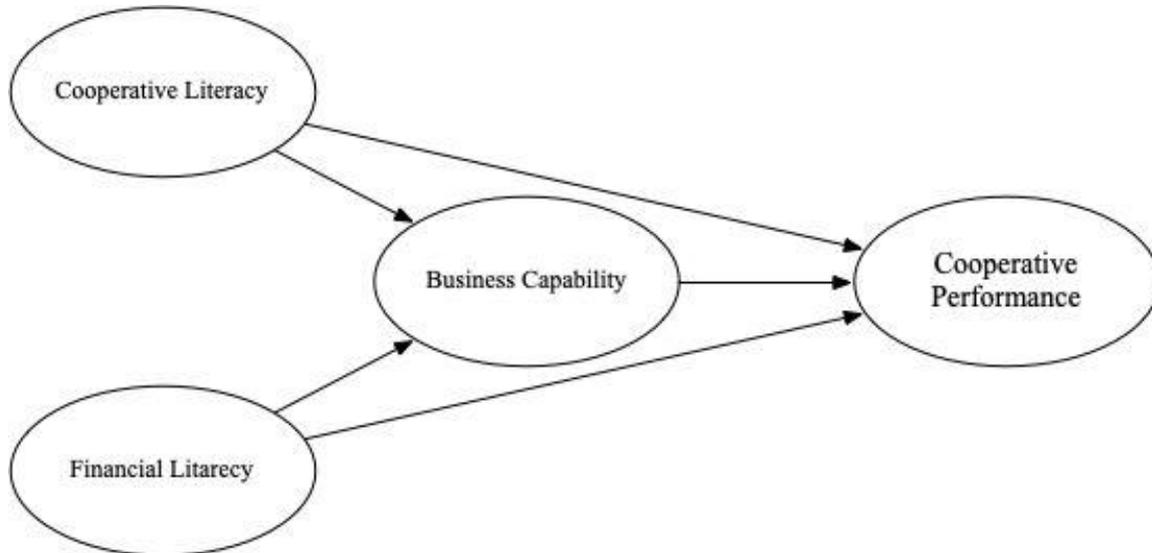


Figure 1. Research Model

Source: Data processed, 2026

This model plays a crucial role in validating the constructs used in the study by assessing their reliability and validity. One of the key indicators for evaluating the outer model is the outer loading value, where all indicators must have a loading factor greater than 0.7. This threshold is used in the convergent validity test to confirm that each indicator adequately represents its corresponding latent variable.

RESULT AND DISCUSSION

Reliability testing is conducted using the Composite Reliability (CR) value, which must be greater than 0.70 to indicate internal consistency. These measures collectively ensure that the model is robust, providing accurate and reliable results for further analysis.

Table 2. Composite Reliability Test

Variable	Value
Cooperative Literacy	0.951
Financial Literacy	0.949
Business Capability	0.943
Cooperative Performance	0.970

Source : Data processed, 2026

The reliability test in this study is evaluated using composite reliability results, which measure the internal consistency of the indicators associated with each variable. A variable is considered reliable if its composite reliability value exceeds 0.70, signifying a strong correlation among its indicators and ensuring that the measurement model is stable and dependable. A high composite reliability value suggests that the observed variables consistently reflect the underlying construct, reducing the risk of measurement errors.

The study evaluates discriminant validity to ensure that each construct is distinct from others within the model, preventing any significant overlap that could compromise the integrity of the findings. Discriminant validity is considered satisfactory when the square root of the Average Variance Extracted (AVE) for each construct is greater than the correlations between that construct and others in the model. It is indicated by an Average Variance Extracted (AVE) value greater than 0.5, signifying that the instrument effectively captures the variance of its respective indicators, thereby confirming its validity. One of the most widely used methods for assessing discriminant validity is the Fornell-Larcker Criterion, which states that discriminant validity is achieved if the square root of the AVE of a construct is greater than its correlation with any other construct in the model. As presented in Table 3, all square root AVE values (diagonal values) exceed the correlations between constructs, confirming that discriminant validity is successfully met.

Table 3. Fornell-Larcker Criterion

	Cooperative Literacy	Financial Literacy	Cooperative Performance	Business Capability
Cooperative Literacy	0.874	0.660	0.814	0.779
Financial Literacy	0.660	0.908	0.385	0.633
Cooperative Performance	0.814	0.385	0.877	0.765

Source: Data processed, 2026

Specifically, cooperative literacy exhibits a square roots AVE (0.874) greater than its highest correlation with cooperative performance (0.814) and business capability (0.779). Financial Literacy demonstrates the strongest discriminant validity, with a square root AVE (0.908) exceeding its correlation with cooperative literacy (0.660), business capability (0.633) and cooperative performance (0.385). Likewise, cooperative performance shows a square root AVE (0.877) higher on its correlation with cooperative literacy (0.814) and business capability (0.765). Business capability also satisfies the criterion, with a square root AVE (0.866) greater than its correlations with cooperative literacy (0.779) and cooperative performance (0.765). These results indicate that each construct shares more variance with its own indicators than with others construct, confirming adequate discriminant validity. Therefore, the measurement model demonstrates that cooperative literacy, financial literacy, business capability and cooperative performance represent empirical distinct concepts.

Convergent validity was evaluated by examining the indicator loadings and the average variance extracted (AVE) for each construct. Convergent validity is considered adequate when indicator loadings exceed 0.70 and AVE greater than 0.50. The results indicate that all measurement items load strongly on their respective constructs, with standardized loading exceeding the recommended threshold. In addition, the AVE values for cooperative

literacy, financial literacy, business capability and cooperative performance are all above 0.50, demonstrating that each construct explains more than half of variance of its indicators. These findings confirm that the indicators associated with each construct converge well in representing the same underlying concept. Therefore, the measurement model satisfies the criterion of convergent validity, indicating that cooperative literacy, financial literacy, business capability and cooperative performance are reliably and valid measured by their respective indicators.

Evaluation of the structural model or inner model includes the coefficient of determination (R Squared), the relevance of the prediction (Q Squared) and the effect size (F Squared). R^2 measures how much the independent variable can explain the dependent variable in the model or evaluate the predictive power of the model. The higher the R^2 , the stronger the model. Q^2 measures the model's ability to predict the value of data that has been removed using the blindfolding technique. If $Q^2 > 0$, it means the model has good predictive relevance. F^2 measures the extent of the influence of one latent variable on another latent variable in the inner model. If f^2 is large, it means the relationship between the variables is strong. The results of the inner model test can be seen as follows:

Table 4. R^2 and Q^2 Value

	R-Square	Q-Square
Business Capability	0,638	0,712
Cooperative Performance	0,762	0,754

Source: Data processed, 2026

The R-square value suggests that Cooperative Literacy and Financial Literacy can explain 63.8% of the variation in Business Capability. This suggests that knowledge-based factors play a substantial role in shaping the operational and managerial capability of cooperatives. A higher R-squared value suggests a stronger explanatory power of the model in relation to the dependent variable. Furthermore, Cooperative Literacy, Financial Literacy, and Business Capability can explain 76.2% of the variation in Cooperative Performance. This level of explained variance can be classified as high, indicating that the proposed model provides a strong representation of determinants of cooperative performance. The Q-Squared (Q^2) value, which measures the predictive significance of the model in explaining the relationships between latent constructs. A Q-square value greater than zero suggests that the model can forecast accurately. These findings confirm the robustness of the estimation model, highlighting its ability to provide reliable predictions and valuable insights for further research and practical applications. These results indicate that structural relationships not only explain past observations but also possess meaningful predictive accuracy for future performance outcomes. In particular, the higher Q-square value for cooperative performance suggests that the combined effects of cooperative literacy, financial literacy, and business capability provide robust predictive insight into cooperative performance.

Table 5, Effect Size (F²)

	F-Square
Cooperative Literacy → Business Capability	0.677
Financial Literacy → Business Capability	-0.039
Cooperative Literacy → Cooperative Performance	0.146
Financial Literacy → Cooperative Performance	0.222
Business Capability → Cooperative Performance	0.394

Source: Data processed, 2025

The f-square value indicates that Cooperative Literacy has a substantial influence on Business Capability and on Cooperation Performance, whereas Cooperative Literacy and Financial Literacy have a small influence on Cooperative Performance. The effect size (F²) or partial F-test is used to explain the significant proportion of some independent variable variations in the dependent variable. Therefore, the impact of cooperative literacy on cooperative performance is bigger than the impact of financial literacy.

The Goodness of Fit (GoF) test is used to assess how well the overall model explains the observed data. This evaluation ensures that the model provides an adequate representation of the relationships between variables, thereby enhancing its reliability and predictive accuracy. A well-fitting model indicates that the theoretical framework aligns with the empirical data, supporting the validity of the research findings.

Table 6, Testing the Goodness of Fit Model

Criteria	Cut off Value	Result	Evaluation
Average path coefficient	P Value ≤ 0,05	0,001	Fulfilled
Average R-Squared (ARS)	P Value ≤ 0,05	0,001	Fulfilled
Average adjusted R-Squared (AARS)	P Value ≤ 0,05	0,001	Fulfilled
Average Block VIF (AVIF)	≤ 3,3 but ≤ 5 still acceptable	2,181	Ideal
Tenenhouse GoF (GoF)	≥ 0,10 (small); ≥ 0,25 (moderate); ≥ 0,36 (large)	0,737	Large

Source: Data processed, 2025

Table 6 shows that overall, in accordance with the cutoff criteria, the model fit test is satisfied. The P-Value for the APC, ARS, and AARS values is ≤ 0.05. The AVIF value is also at its optimal level, which is 3.3. The major criteria include the 0.757 Tenenhouse Good of Fit score. From the Goodness of Fit test, all methods meet the specified criteria, so it can be concluded that the tested research model has good validity and reliability. Furthermore, the model can be used to draw reliable conclusions and has good predictive quality, so the research results can be used for policy recommendations or business decisions. The following research model demonstrates how hypothesis testing is done.

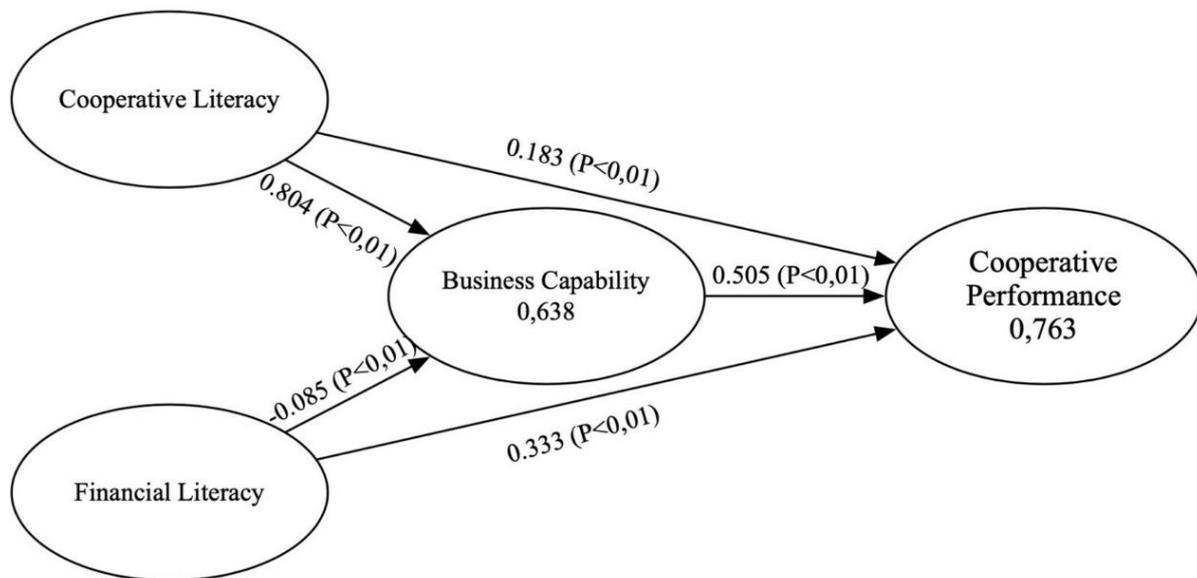


Figure 2. Output Model

Source: Data processed, 2026

To assess the effectiveness of the research model, the path coefficient and its corresponding P-value are analyzed. The path coefficient measures the strength and direction of the relationship between variables, while the P-value indicates the statistical significance of these relationships. In this study, a P-value threshold of 0.05 is used, meaning that any relationship with a P-value below this level is considered statistically significant, reducing the likelihood of error in hypothesis testing.

The following table presents the test results obtained using WarpPLS 8, highlighting the path coefficients and their respective P-values. These findings provide valuable insights into the direct and indirect effects of variables within the model, helping to determine the validity and predictive power of the proposed relationships. By evaluating these metrics, researchers can assess the overall robustness of the model and its alignment with theoretical expectations.

Table 7. Hypothesis Testing of Direct Effect

Variable	Path Coefficient	P-Value	Conclusion
Cooperative literacy → Cooperative Performance	0.184	<0,01	Significant
Financial Literacy → Cooperative Performance	0.333	<0,01	Significant
Business Capabilty → Cooperative Performance	0.505	<0.01	Significant
Cooperative literacy → Business Capability	0.804	<0,01	Significant
Financial Literacy → Business Capability	-0.085	<0,02	Significant

Source: Data processed, 2026

According to the study's findings, business capability, financial literacy, and cooperative literacy all have a favorable and significant impact on cooperative performance. According to research, cooperative knowledge (cooperative literacy) from cooperative managers and administrators will have a positive impact on cooperative performance

((Triwani et al., 2020). Additionally, strong financial literacy will enhance cooperative performance; these findings are consistent with previous studies (Utami & Darmawan, 2021; Indra et al., 2021).

The significance value of $p=0.01$ meets the standard value of 0.01 and indicates that there is a significant relationship between Cooperative Literacy, Financial Literasi and Business Capability to Cooperative Performance, with path coefficients of respectively 0.184, 0.333 and 0.505. This supports the hypothesis that there is a direct relationship between Cooperative Literacy, Financial Literacy and Business Capability to Cooperative Performance, because the significance value of $p < 0.001$. The empirical result provides strong support for the integration of the Resource Based View and Institutional theory in explaining the role cooperative literacy, financial literacy and business capability to enhance cooperative performance.

A path coefficient from Cooperative Literacy to Business Capability is positive and highly significant (CL to BC; $\beta= 0.804$, $p<0.001$) indicating that cooperative literacy constitutes critical intangible organizational resources that strengthen there is a significant correlation. In contrast, there is a weak relationship between Financial Literacy to Business Capability. Financial Literacy exhibits a negative and significant on business capability (FL to BC; $\beta=-0.085$, $p=0.020$), while its indirect effect on cooperative performance through business capability is also negative (FL to BC to CP; $\beta=-0.043$). These findings suggest that financial literacy alone does not function as strategic resource in cooperative context unless it is integrated with cooperative literacy and institutional understanding. Unlike cooperative literacy, which simultaneously strengthens capability and institutional alignment, financial literacy appears to lack the normative and organizational embeddedness required to translate financial knowledge into enhanced business capability. Based on this description, to improve the performance of cooperatives, cooperative administrators and managers must have high cooperative literacy by participating in cooperative training. The more knowledge of cooperatives increases, the better management of cooperatives so that the performance of cooperatives increases. Based on the questionnaire distributed to cooperative management in West Java in this study, cooperative knowledge (cooperative literacy) still needs to be improved.

Financial literacy is also important for cooperative management, so that the direct effect to cooperative performance is higher (FL to CP; $\beta=0.333$, $p<0.001$), management must have better financial knowledge. Cooperative management must continue to learn and increase knowledge through education or training that sharpens knowledge of financial management. Effect of financial literacy on business capabilities was found to be weak and negative. This unexpected result may indicate that financial knowledge alone is insufficient to improve business capability unless it is supported by adequate managerial skills and organization system. Cooperative literacy path coefficients have greater value than financial literacy path coefficients in relation to business capabilities. This means that cooperative literacy has more influence on the business capabilities of cooperative management. Cooperative literacy is not just about understanding cooperative principles. It directly enhances business capabilities by improving decision making, governance and adaptability. When cooperative managers are well versed in cooperative operations, they can lead organization more effective and sustainably.

In the relationship with cooperative performance, the opposite occurs: financial literacy has a path coefficient ($\beta=0.333$) that is greater than the cooperative literacy path coefficient ($\beta=0.184$). Financial literacy significantly impacts on cooperative performance.

This happens because cooperative operates with a unique financial structure that requires careful handling of funds, member contributions and profit distribution. Financial literacy is backbone of cooperative management.

An indirect effect comes when the independent variable influences the dependent variable through a mediator variable. A test of the indirect influence of the variable Business Capability is performed to determine its mediating role in the study equation. Business capability is intended to strengthen the impact of cooperative literacy and financial literacy on cooperative performance. The indirect effect test determines whether a p-value of <0.05 indicates a significant or meaningful indirect effect. If $p > 0.05$ is not significant, there is no obvious indirect effect.

Table 8. Hypothesis Testing of Indirect Effect

Variable	Path Coefficient	P-Value	Conclusion
Cooperative literacy → Business Capability → Cooperative performance	0.405	< 0,01	Significant (Mediation Effect)
Financial literacy → Business Capabilty → Cooperative performance	-0.043	0.072	Not Significant (No Mediation Effect)

Source: Data processed, 2026

Business Capability plays a crucial role in mediation the relationship between Cooperative Literacy and Cooperative Performance, thereby supporting the proposed hypothesis. The findings indicate that Cooperative Literacy has a positive and significant direct impact on Cooperative Performance, meaning that cooperatives with higher literacy levels tend to perform better. However, the presence of Business Capability further strengthens this relationship by serving as a mediating factor. This type of mediation is referred to as partial moderation, as Business Capability does not fully replace the direct effect of Cooperative Literacy on Cooperative Performance but rather enhances and complements it. These results highlight the importance of equipping cooperative managers with both business knowledge and operational skills, ensuring that cooperatives can maximize their potential and improve their overall efficiency and success.

The findings indicate that Business Capability does not mediate the relationship between Financial Literacy and Cooperative Performance, leading to the conclusion that the hypothesis is not supported. While Financial Literacy has a positive and significant direct effect on Cooperative Performance ($p < 0.05$), the indirect effect through Business Capability is not statistically significant ($p \geq 0.05$). This suggests that although financial literacy directly enhances cooperative performance, Business Capability does not serve as an effective mediating factor in this relationship. These findings suggest that financial literacy alone is a key driver of cooperative success, independent of business capability. This underscores the critical role of financial knowledge and management skills in enhancing cooperative performance, emphasizing the importance of equipping cooperative managers with strong financial literacy to ensure effective decision-making and sustainability.

Overall, the findings demonstrate that the relationship between Cooperative Literacy and cooperative performance is best explained by combined RBV-institutional perspectives. Cooperative literacy function as a strategic organizational resource that enhance business

capability (CL to BC; $\beta=0.804$, $p < 0.001$) and simultaneously reinforces conformity to cooperative norms and governance principle (CL to CP; $\beta=0.184$, $p < 0.001$). Business capability serves as key mediating mechanism ($\beta_{\text{indirect}}=0.405$) through which cooperative literacy is translated into superior cooperative performance (BC to CP; $\beta=0.505$, $p < 0.001$). These results provide empirical evidence that cooperative performance is driven not only efficiency-based mechanisms emphasized by RBV, but also legitimacy-based mechanisms emphasized by institutional theory.

Integrating RBV and Institutional theory, the findings show that internal strategic resources and institutionalized knowledge work together to shape cooperative performance. RBV illustrates how cooperative literacy improves business capability as a fundamental organizational competency, whereas institutional theory reveals how cooperative literacy encourages adherence to cooperative norms and governance principles. As a result, cooperative literacy serves not just as a technical resource but also as an institutional vehicle for aligning organizational activities with cooperative principles. This dual role emphasizes that improving cooperative performance requires both managerial capability and institutionalized knowledge incorporated into members and leaders.

However, further research is necessary to examine whether other factors, such as leadership effectiveness, market conditions, or industry dynamics, play a role in shaping the relationship between financial literacy, business capability, and cooperative performance. A deeper exploration of these variables could provide a more comprehensive understanding of the mechanisms that contribute to cooperative success.

Table 9. Hypothesis Summary

Hypothesis	Relation	Result	Conclusion
H1	Cooperative literacy → Business Capabilty	Accepted	Positive and strong relation (TE=0.804)
H2	Financial Literacy → Business Capabilty	Not Accepted	Negative and weak relation (TE=-0.085)
H3	Cooperative literacy → Cooperative Performance	Accepted	Positive and Strong relation (TE=0.589)
H4	Financial Literacy → Cooperative Performance	Accepted	Positive and Medium relation (TE=0.290)
H5	Business Capabilty → Cooperative Performance	Accepted	Positive and strong relation (TE=0.505)
H6	Cooperative literacy → Business Capability → Cooperative performance	Mediated	Indirect Effect = 0.405
H7	Financial literacy → Business Capabilty → Cooperative performance	Not Mediated	Indirect Effect = - 0.043

Source: Data processed, 2026

CONCLUSIONS

This study concludes that Cooperative Literacy, Financial Literacy, and Business Capabilities have a significant impact on Cooperative Performance. Additionally, both cooperative literacy and financial literacy significantly influence business capabilities, with cooperative literacy playing a more substantial role in shaping business capabilities compared to financial literacy. Conversely, when examining the direct effect on cooperative performance, Financial Literacy has a stronger influence than Cooperative Literacy.

Furthermore, Business Capability serves as a mediating factor on relationship between Cooperative Literacy to cooperative performance, but no effect for Financial Literacy. These findings highlight the importance of enhancing Cooperative Literacy while strengthening Business Capabilities and strengthening Financial Literacy to drive overall Cooperative success. Therefore, it is important for cooperative management to continue to improve both literacy through education and training organized by related departments or institutions to improve the management's business capabilities and overall cooperative performance. One limitation of this study is the need to expand the number of respondents, particularly by increasing the participation of cooperative management in West Java. A larger sample size would enhance the robustness and generalizability of the findings, leading to more comprehensive and reliable results. Additionally, future research should consider extending the study to other regions beyond West Java to gain a broader perspective on cooperative performance and management practices. Expanding the geographic scope would allow for a comparative analysis across different areas, providing deeper insights into the factors influencing cooperative success.

Theoretical implication of this research are first, this study contributes to RBV by expanding its explanatory power beyond solely economic outcomes, demonstrating how business capability influences cooperative literacy as an institutional resource. Second, it contributes to Institutional Theory by demonstrating that cooperative literacy is not solely a result of external pressure but is also shaped by internal strategic skills. Third, the mediating structure shows that cooperative literacy is a more effective transmission channel than financial literacy for linking business capability to corporate performance, implying that institutional conformity may be more important than financial structuring in achieving long-term performance. This integrated framework promotes a hybrid theoretical approach in which internal resources and external legitimacy both contribute to company performance. For cooperative managers and policy makers, the finding emphasizes the strategic importance of investing in cooperative literacy through training, education programs and knowledge sharing initiatives. Improving managers understanding of cooperative principles, and financial management can significantly enhance business capability and cooperative performance. Managers should focus not only on acquiring financial resources but also on developing internal capabilities derived from knowledge and skills. In addition, the negative relationship financial literacy to business capability suggests that financial literacy cooperatives tend to adopt more prudent financial strategies. Therefore, cooperative leaders should balance external financing and internal resource development to ensure sustainable performance. One limitation of this study is the need to expand the number of respondents, particularly by increasing the participation of cooperative management in West Java. A larger sample size would enhance the robustness and generalizability of the findings, leading to more comprehensive and reliable results. Additionally, future research should consider extending the study to other regions beyond West Java to gain a broader perspective on cooperative performance and management practices. Expanding the geographic scope would allow for a comparative analysis across different areas, providing deeper insights into the factors influencing cooperative success. This research was conducted with the support of the Universitas Kuningan through its internal competition grant funding. We sincerely appreciate the university's support in facilitating this study.

REFERENCES

- Adang, R., & Wulandari, I. (2026). Pengaruh Literasi Keuangan, Modal Usaha Dan Pengelolaan Keuangan Terhadap Kinerja Keuangan Umkm Di Kabupaten Sleman. *COSTING: Journal of Economic, Business and Accounting*, 9, 225–236.
- Anggraini, I., Armiani, & Wahyullah, M. (2023). Pengaruh Inklusi Keuangan, Literasi Keuangan, dan Pengelolaan Keuangan terhadap Kinerja UMKM di Kabupaten Dompu. *Kompeten: Jurnal Ilmiah Ekonomi Dan Bisnis*, 6(3), 119–121.
- Aristana, I. N., Junipisa, N. M. E., & Yogantara, K. K. (2020). Model kinerja koperasi. *Jurnal Ekonomi Dan Bisnis*, 23(Oktober), 285–316.
- Das, U. C., & Mishra, A. K. (2019). Management: Concepts and Practice. In *Directorate of Distance & Continuing Education*. <https://doi.org/10.1093/ptj/59.5.664a>
- Dito Rinaldo, Vina Anggilia Puspita, & Nico Irawan. (2025). Improving Financial Literacy and Perception To Increase Public Involvement in Capital Markets: Evidence in Indonesia. *Matrik : Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 19(2), 143–158. <https://doi.org/10.24843/matrik:jmbk.2025.v19.i02.p03>
- Ernita, Firmansyah, & Martial, T. (2020). Entrepreneurship attitude of managers, member participation, and cooperative performance: Evidence from Indonesia. *Management Science Letters*, 10(8), 1719–1728. <https://doi.org/10.5267/j.msl.2020.1.008>
- Goyal, K., & Kumar, S. (2021). Financial literacy: A systematic review and bibliometric analysis. *International Journal of Consumer Studies*, 45(1), 80–105. <https://doi.org/10.1111/ijcs.12605>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hamzah, S. M., & Yusoff, M. N. H. (2025). the Influence of Financial Management and Financial Literacy on Co-Operative Performance in Malaysia. *Advanced International Journal of Business, Entrepreneurship and SMEs*, 7(24), 288–302. <https://doi.org/10.35631/aijbes.724019>
- Haryono, A., Handayani, S., Munir, S., & Megasari, R. (2021). The Development of Book on the Literacy of Cooperative and Life-Based Pancasila Economy . *Proceedings of the Sixth Padang International Conference On Economics Education, Economics, Business and Management, Accounting and Entrepreneurship (PICEEBA 2020)*, 179(Piceeba 2020), 314–319. <https://doi.org/10.2991/aebmr.k.210616.047>
- Indra, N., Nupi H, M. A., & Pratama, G. (2021). Implementasi Financial Literacy Dalam Upaya Meningkatkan Financial Performance Pada Keberlangsungan Usaha Koperasi. *Coopetition : Jurnal Ilmiah Manajemen*, 12(3), 389–396. <https://doi.org/10.32670/coopetition.v12i3.747>
- Klapper, L., & Lusardi, A. (2020). Financial literacy and financial resilience: Evidence from around the world. *Financial Management*, 49(3), 589–614. <https://doi.org/10.1111/fima.12283>
- Lusardi, A., & Mitchell, O. S. (2023). The Importance of Financial Literacy: Opening a New Field. *Journal of Economic Perspectives*, 37(4), 137–154. <https://doi.org/10.1257/jep.37.4.137>
- Risi, D., Vigneau, L., Bohn, S., & Wickert, C. (2023). Institutional theory-based research on corporate social responsibility: Bringing values back in. *International Journal of Management Reviews*, 25(1), 3–23. <https://doi.org/10.1111/ijmr.12299>
- Sakdiyah, Ismail, & Nada, K. (2019). Pengaruh Pengetahuan Perkoperasian Terhadap Partisipasi Anggota Pada Koperasi Pegawai Republik Indonesia (KPRI) Subur Makmur Banda Aceh. *Jurnal Sains Ekonomi Dan Edukasi*, VII(2), 50–60.
- Sari, K. N. P., & Purwanto, A. (2022). Pengaruh Sistem Informasi Akuntansi, Sistem Pengendalian Internal, dan Pengetahuan Pengurus Terhadap Kinerja Koperasi (Studi Empiris pada Koperasi di Kabupaten Bantul). *DIPONEGORO JOURNAL OF ACCOUNTING*, 11(2020), 1–14.
- Siregar, A. P. (2020). Kinerja Koperasi Di Indonesia. *Vigor: Jurnal Ilmu Pertanian Tropika Dan Subtropika*, 5(1), 31–38. <https://doi.org/10.31002/vigor.v5i1.2416>
- Teece, D. J. (2019). A capability theory of the firm: an economics and (Strategic) management

- perspective. *New Zealand Economic Papers*, 53(1), 1–43.
<https://doi.org/10.1080/00779954.2017.1371208>
- Triwani, S., Zulfadli, & Syapsan. (2020). Pengaruh pengetahuan perkoperasian, kemampuan manajerial, dan kompetensi kewirausahaan terhadap partisipasi anggota serta dampaknya terhadap kinerja koperasi Koperasi Karyawan di Kota Pekanbaru. *Jurnal Tepak Manajemen Bisnis*, XI(4), 754–774.
<https://jtmb.ejournal.unri.ac.id/index.php/JTMB/article/viewFile/7859/6790>
- Utami, K. G., & Darmawan, N. A. S. (2021). Pengaruh Tingkat Literasi Keuangan Terhadap Kinerja Pengelolaan Keuangan Pada Koperasi Simpan Pinjam Di Kabupaten Buleleng. *JIMAT (Jurnal Ilmiah Mahasiswa Akuntansi) Universitas Pendidikan Ganesha*, 12(1), 2614 – 1930.
- Wahyudi, J., & Aini, S. Q. (2020). Analisis Kinerja Koperasi Unit Desa Menggunakan Balanced Scorecard. *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, 16(2), 113–128. <https://doi.org/10.33658/jl.v16i2.198>



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 19 No. 1, 2026 (February), 73-94



DIGITIZING STRATEGY FOR MSMEs IN BANYUMAS WITH A WEB-BASED PAVLOVIAN CONDITIONING APPROACH



SINTA 2

Lina Fatimah Lishobrina¹⁾, Diovianto Putra
Rakhmadani²⁾, Maliana Puspa Arum³⁾, Ade Yanyan Ramdhani⁴⁾

^{1,2,3,4} Universitas Telkom, Purwokerto, Indonesia

Email: linaflishobrina@telkomuniversity.ac.id

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p05>

ABSTRACT

This study examines MSME digitalization through a Web-Based Pavlovian Conditioning approach in Cikakak Village by integrating the Technology–Organization–Environment (TOE) and Diffusion of Innovation (DOI) frameworks. The environmental context includes environmental uncertainty and government support, the organizational context focuses on CEO innovativeness, and the technological context emphasizes IT infrastructure. Innovation attributes analyzed under the DOI model include Relative Advantage, Compatibility, Complexity, Trialability, and Observability. Using a quantitative approach, data were collected through questionnaires and analyzed using Structural Equation Modeling (SEM) with LISREL software. The results show that Relative Advantage, Compatibility, Trialability, Government Support, and Environmental Uncertainty significantly influence website-based digital adoption among MSMEs. These findings indicate that MSME actors prioritize perceived benefits, alignment with existing business processes, and opportunities for experimentation when adopting digital technologies. In contrast, CEO innovativeness, IT infrastructure, complexity, and observability do not significantly affect adoption, suggesting that external support and environmental conditions play a stronger role in early-stage digital ecosystems. Theoretically, this study contributes by integrating TOE and DOI models to provide a more contextual explanation of MSME digital adoption in rural areas, emphasizing the dominant influence of environmental factors over organizational readiness in developing regions.

Keywords: pavlovian conditioning; digital transformation; msme; consumer behavior; website adoption.

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) remain a major pillar of Indonesia's economic growth, contributing more than 60% of national Gross Domestic Product (GDP) and demonstrating sustained expansion in recent national economic reports through 2024. With more than 64 million MSMEs operating across diverse sectors, this segment holds substantial potential to enhance productivity and competitiveness through digital transformation. Recent studies define digital transformation as a strategic and organizational process of integrating digital technologies to fundamentally reshape business models, operational processes, and customer engagement patterns (Verhoef et al., 2021; Vial, 2021). In the MSME context, digital transformation has been increasingly recognized as a critical

mechanism for resilience, scalability, and long-term sustainability in uncertain environments (Kraus et al., 2022; AlNuaimi et al., 2022).

One of the most prevalent forms of digital transformation among MSMEs is the adoption of websites and e-commerce platforms to support marketing, branding, and sales activities. Contemporary research highlights that digital platform adoption improves market reach, operational agility, and customer data utilization, ultimately contributing to performance enhancement (Ainin et al., 2020; Dwivedi et al., 2021). The determinants of such adoption are frequently explained using the Technology–Organization–Environment (TOE) framework and Diffusion of Innovation (DOI) theory, which emphasize technological readiness, organizational capability, and environmental support as key drivers (Baker, 2021; Gangwar, 2020). These frameworks remain relevant in explaining MSME digitalization behavior in emerging economies.

However, recent empirical findings suggest that website adoption alone does not automatically translate into improved sales performance. Studies in digital consumer behavior indicate that ineffective user experience design, lack of emotional engagement, weak trust-building mechanisms, and limited interactive stimuli significantly reduce conversion rates (Rose et al., 2021; Lemon & Verhoef, 2022). This suggests that technological implementation must be complemented by behavioral design principles. Many MSME websites still function primarily as informational platforms rather than persuasive digital environments capable of influencing purchase decisions.

To address this gap, this study proposes integrating the Pavlovian (classical conditioning) approach into e-commerce website development for MSMEs in Cikakak Village. Contemporary behavioral research confirms that stimulus–response mechanisms remain relevant in digital interface design, particularly in shaping user engagement, trust formation, and loyalty (Hoyer et al., 2022; Bleier et al., 2020). In this framework, digital interfaces act as structured stimuli—such as visual cues, consistent branding, reward triggers, and responsive feedback—that elicit predictable psychological responses, including curiosity, satisfaction, and purchase intention. Repeated exposure and reinforcement mechanisms can strengthen behavioral conditioning, ultimately influencing consumer decision-making and repeat purchasing behavior.

Operationally, the Pavlovian approach is embedded into website architecture through persuasive design elements, gamified incentives, emotional branding signals, and adaptive feedback systems. By combining organic stimuli (design, color, imagery) and inorganic stimuli (discount triggers, notifications, reward systems), MSMEs can create interactive digital ecosystems that actively shape user responses rather than passively presenting information. Although the developed web-based system may include operational features such as inventory tracking and customer management, the primary contribution of this research lies in examining how Pavlovian-based interaction influences engagement and sales performance. Despite growing literature on MSME digital transformation, limited recent studies integrate behavioral psychology into website design as a strategic intervention mechanism. Most prior research emphasizes readiness factors, usability, or digital marketing strategies, leaving a theoretical and practical gap in stimulus–response-based digital innovation. Therefore, this study contributes by bridging digital transformation theory with behavioral conditioning principles, offering a novel interdisciplinary model to enhance MSME competitiveness in the digital era. Ultimately, this research aims to develop and empirically validate a Pavlovian-based web sales system that improves engagement, conversion rates, and adaptive business processes in an increasingly digital marketplace.

Micro, Small, and Medium Enterprises (MSMEs) remain a major pillar of Indonesia's economic growth, contributing more than 60% of national Gross Domestic Product (GDP) and demonstrating sustained expansion in recent national economic reports through 2024. With more than 64 million MSMEs operating across diverse sectors, this segment holds substantial potential to enhance productivity and competitiveness through digital transformation. Recent studies define digital transformation as a strategic and organizational process of integrating digital technologies to fundamentally reshape business models, operational processes, and customer engagement patterns (Verhoef et al., 2021; Vial, 2021). In the MSME context, digital transformation has been increasingly recognized as a critical mechanism for resilience, scalability, and long-term sustainability in uncertain environments (Kraus et al., 2022; AlNuaimi et al., 2022).

One of the most prevalent forms of digital transformation among MSMEs is the adoption of websites and e-commerce platforms to support marketing, branding, and sales activities. Contemporary research highlights that digital platform adoption improves market reach, operational agility, and customer data utilization, ultimately contributing to performance enhancement (Ainin et al., 2020; Dwivedi et al., 2021). The determinants of such adoption are frequently explained using the Technology–Organization–Environment (TOE) framework and Diffusion of Innovation (DOI) theory, which emphasize technological readiness, organizational capability, and environmental support as key drivers (Baker, 2021; Gangwar, 2020). These frameworks remain relevant in explaining MSME digitalization behavior in emerging economies.

However, recent empirical findings suggest that website adoption alone does not automatically translate into improved sales performance. Studies in digital consumer behavior indicate that ineffective user experience design, lack of emotional engagement, weak trust-building mechanisms, and limited interactive stimuli significantly reduce conversion rates (Rose et al., 2021; Lemon & Verhoef, 2022). This suggests that technological implementation must be complemented by behavioral design principles. Many MSME websites still function primarily as informational platforms rather than persuasive digital environments capable of influencing purchase decisions.

Beyond the behavioral dimension, this study also acknowledges the importance of contextual readiness factors by integrating the TOE and DOI frameworks into the research model. Technological readiness, organizational leadership orientation, and environmental pressures such as government support and market uncertainty are expected to moderate or strengthen the effectiveness of Pavlovian-based digital strategies. In dynamic and competitive environments, MSMEs must not only adopt digital platforms but also strategically design them to create differentiated customer experiences. Recent studies emphasize that customer experience (CX) has become a central competitive advantage in digital ecosystems, where emotional engagement and personalization significantly drive loyalty and revenue growth (Klaus & Zaichkowsky, 2021; De Keyser et al., 2020).

Furthermore, the acceleration of digital adoption following global disruptions has shifted consumer expectations toward seamless, trustworthy, and responsive online interactions. Customers increasingly evaluate digital platforms based on perceived credibility, transparency, and interactive responsiveness. Therefore, embedding conditioning principles into interface design may strengthen trust cues and reduce perceived risk, which are critical determinants of online purchase intention. This research thus extends digital transformation discourse by positioning behavioral conditioning as a strategic complement to technological investment. By integrating digital transformation theory, innovation adoption models, and

behavioral psychology, this study provides a more holistic framework for MSME digital competitiveness. The proposed Pavlovian-based web sales system is expected not only to enhance engagement and conversion rates but also to support adaptive learning processes within MSMEs, enabling continuous improvement in response to evolving consumer behavior and digital market dynamics.

METHODS

This study adopts the Scrum method as its software development approach. Figure 1 is Scrum methodology, introduced by Jeff Sutherland and his team in the early 1990s, is an agile software development methodology. Subsequent enhancements to the Scrum framework were made by Schwaber and Beedle. The principles of Scrum are aligned with those of the agile manifesto and serve as a guide for development endeavors. This process involves a series of framework activities, including requirements gathering, analysis, design, evolution, and delivery. Within each framework activity, tasks are organized into iterative cycles known as sprints. The number of sprints required for each activity may differ based on the project's size and complexity.. Additionally, the work undertaken in each sprint is designed to meet particular project requirements and is continuously modified in real time by the Scrum team.

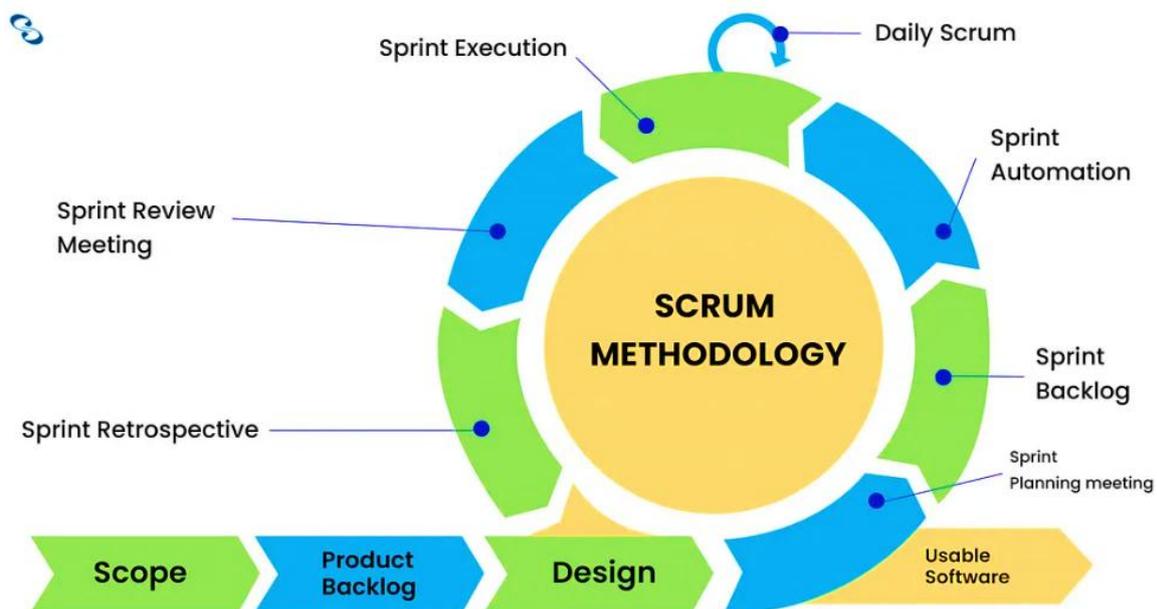


Figure 1 . Scrum Methodology

Source: Stackademic.com, 2023

In order to find the right respondents to realize the Pavlovian theory, data will be taken from MSMEs in Cikakak Village who are considered representative so that the software being developed can then be tested. The testing will be carried out using usability testing. Usability testing is a technique that assesses a product or site's UX (User Experience) by putting it through its paces with a group of users or clients. In order to determine whether or not the website development aligns with the original research output aims, usability testing is done by evaluating the usability of the product or site on a set of users or consumers.

The Scrum framework is widely recognized as an agile project management methodology that emphasizes adaptability, collaboration, and incremental value delivery (Denning, 2021; Schwaber & Sutherland, 2020). In contemporary research above 2020, Scrum is consistently identified as an effective approach for managing dynamic digital projects due to its responsiveness to evolving user requirements and rapidly changing business environments (Serrador & Pinto, 2021). Although originally developed for software engineering, Scrum has increasingly been adopted across multiple industries undergoing digital transformation.

In this study, Scrum is utilized as the development framework for designing and implementing a web-based sales system that integrates a Pavlovian-based approach for MSMEs. The selection of Scrum is grounded in its iterative sprint structure, continuous stakeholder collaboration, and systematic review mechanisms, which allow ongoing refinement based on user feedback (Schwaber & Sutherland, 2020). Through incremental development cycles, the methodology supports rapid prototyping, continuous evaluation, and adaptive improvement, ensuring that the system remains aligned with user needs and the dynamic digital ecosystem (Denning, 2021). The research method consists of several stages aligned with Scrum principles. First, the product backlog is defined based on the results of preliminary observations, interviews with MSME actors, and identification of system requirements related to digital sales activities, user engagement, and stimulus–response elements derived from the Pavlovian approach. The backlog includes functional requirements such as product display, transaction processes, user interaction features, and engagement-oriented design elements intended to influence user behavior. Second, the development process is carried out through a series of sprints, each lasting two to four weeks. During each sprint, the research and development team focuses on developing specific system features prioritized according to their value and relevance to MSME needs. At the end of every sprint, a functional prototype or product increment is produced and evaluated through testing and feedback sessions involving potential users and MSME stakeholders. This iterative cycle enables continuous refinement of both system functionality and user experience design.

Daily Scrum meetings or coordination sessions are conducted to monitor development progress, identify technical or design constraints, and ensure alignment between system objectives and research goals (Cohn, 2020). These meetings support transparency and collaboration among team members while allowing rapid problem resolution during development. Furthermore, sprint reviews and retrospectives are conducted at the end of each iteration to evaluate development outcomes, assess user responses, and identify areas for improvement (Sutherland, 2014). The evaluation results are then incorporated into the next sprint planning phase, ensuring that system improvements are based on empirical findings and user feedback. This iterative evaluation process is particularly important in implementing the Pavlovian approach, as stimulus–response effectiveness needs to be continuously tested and refined based on user interaction patterns. By applying Scrum methodology, this research ensures that system development remains adaptive, user-centered, and aligned with MSME operational needs. The final output of this method is a web-based sales system that has undergone iterative validation and refinement, enabling it to support MSME digital transformation while improving engagement, user experience, and potential sales performance.

This study adopts an integrated theoretical framework combining the Technology–Organization–Environment (TOE) model and the Diffusion of Innovation (DOI) theory to comprehensively analyze the determinants of MSME digital adoption. The TOE framework is utilized to examine adoption factors from three contextual dimensions. The technological

context evaluates the availability and adequacy of IT infrastructure as a supporting resource for website-based digitalization. The organizational context focuses on internal characteristics, particularly CEO innovativeness, which reflects leadership openness toward change and innovation. The environmental context assesses external pressures and support systems, including government support and environmental uncertainty, which may influence strategic digital decisions.

To strengthen the explanatory power of the model, DOI theory is incorporated to capture the perceived characteristics of innovation that directly affect adoption behavior. Five innovation attributes are measured: Relative Advantage (perceived benefits), Compatibility (alignment with existing business processes), Complexity (perceived difficulty of use), Trialability (opportunity for experimentation), and Observability (visibility of results). By integrating TOE and DOI, this study bridges contextual readiness factors with perceptual innovation attributes, providing a multidimensional understanding of digital transformation among MSMEs.

Methodologically, this research employs a quantitative approach using structured questionnaires distributed to 420 MSME respondents. The collected data were tested for validity and reliability using SPSS version 2023, ensuring measurement consistency. Furthermore, Structural Equation Modeling (SEM) was applied to analyze the relationships among variables and to test the proposed hypotheses simultaneously. This combined theoretical and methodological approach enables a more robust explanation of website-based digital adoption behavior in the MSME context. In terms of research methodology, this study integrates two main approaches: Scrum as the system development method and Structural Equation Modeling (SEM) as the analytical method. Scrum is applied in the development of the web-based sales system using iterative sprint cycles, continuous evaluation, and adaptive improvements based on stakeholder feedback. This agile approach ensures flexibility and responsiveness throughout the development process. Meanwhile, SEM is employed to test the theoretical framework integrating the Technology–Organization–Environment (TOE) model and Diffusion of Innovation (DOI) theory. The TOE framework examines technological (IT infrastructure), organizational (CEO innovativeness), and environmental (government support and environmental uncertainty) contexts, while DOI analyzes innovation attributes such as Relative Advantage, Compatibility, Complexity, Trialability, and Observability. The combination of Scrum and SEM provides both practical system development validation and rigorous empirical testing of the proposed digital adoption model.

RESULT AND DISCUSSION

From this research, a total of 420 respondents were collected, and the data were tested and confirmed to be valid and reliable using SPSS version 2023. The Relative Advantage variable consists of five statement indicators used to measure respondents' perceptions of the benefits obtained from adopting website-based digitalization. The results indicate that respondents generally perceive digital adoption as providing efficiency, broader market reach, and improved business performance.

Table 1. Respondents' Responses Regarding the Relative Advantage Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Relative Advantage	RA1	0	0	20	133	125	1374	85.07%
	RA2	0	3	84	117	96	1206	80.40%
	RA3	1	0	8	162	229	1417	88.65%
	RA4	0	5	14	164	128	1096	84.90%
	RA5	0	10	43	123	149	1656	87.7%
Average Value of the Relative Advantage Variable							1374.50	85.70%
Standard Deviation Value							47.35	2.78%

Source: Data processed, 2023

Table 1. Respondents' Responses Regarding the Relative Advantage Variable presents the distribution of respondents' answers regarding the Relative Advantage variable, which reflects MSME owners' perceptions of the benefits obtained from adopting website-based digitalization. This variable was measured using five statement indicators (RA1–RA5) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that the majority of respondents selected high response categories (scores 4 and 5) across all indicators, while very few respondents chose low scores (1 and 2). This pattern indicates that most MSMEs perceive website adoption as providing substantial advantages for their business operations.

Among the five indicators, RA3 recorded the highest percentage score (88.65%), suggesting that the benefit represented by this statement is the most strongly perceived by respondents. In contrast, RA2 obtained the lowest percentage (80.40%), although it still falls within a very high category. The score values for each indicator range from 1,096 to 1,656, reflecting a strong concentration of responses in the “agree” and “strongly agree” categories. Overall, these findings demonstrate that website-based digitalization is widely perceived as beneficial, particularly in terms of improving efficiency, expanding market reach, and enhancing business performance.

The average score for the Relative Advantage variable is 1,374.50, with an overall percentage of 85.70%, indicating a very high level of perceived benefit among respondents. This suggests that the advantages of digital adoption constitute a major motivating factor for MSMEs to implement website technology in their business activities. Furthermore, the standard deviation value of 47.35 (2.78%) indicates relatively low variability in responses, meaning that respondents' perceptions are fairly homogeneous. In other words, MSME actors tend to share a consistent view that website-based digitalization provides significant and tangible benefits. These results reinforce the argument that perceived relative advantage plays a crucial role in encouraging the adoption of digital technology among MSMEs.

Table 2. Respondents' Responses Regarding the Compatibility Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Compatibility	CT1	0	1	29	59	71	1084	80.77%
	CT2	0	2	36	53	59	1073	80.03%
	CT3	1	8	35	54	52	1035	77.50%
Average Value of the Compatibility Variable							764.00	79.43%
Standard Deviation Value							24.51	1.03%

Source: Data processed, 2023

Table 2. Respondents' Responses Regarding the Compatibility Variable presents the distribution of respondents' answers regarding the Compatibility variable, which reflects the extent to which website-based digitalization is perceived as consistent with existing values, needs, experiences, and business practices of MSMEs. This variable was measured using three statement indicators (CT1–CT3) on a five-point Likert scale, where higher scores indicate stronger agreement. The results indicate that most respondents selected high response categories (scores 4 and 5) for all indicators, while very few respondents chose low scores (1 and 2). This pattern suggests that the adoption of website technology is generally considered compatible with the operational conditions and business characteristics of MSMEs.

Among the indicators, CT1 achieved the highest percentage score (80.77%), indicating that the aspect represented by this statement is perceived as the most compatible with respondents' business activities. CT2 follows closely with a percentage of 80.03%, while CT3 records the lowest percentage at 77.50%, though it still falls within a high category. The score values for each indicator range from 1,035 to 1,084, reflecting a strong concentration of responses in the “agree” and “strongly agree” categories. These findings imply that website-based digitalization aligns well with the needs and capabilities of MSMEs, although some aspects may require further adjustment or support to achieve optimal compatibility.

The average score for the Compatibility variable is 764.00, with an overall percentage of 79.43%, indicating a high level of perceived compatibility among respondents. This suggests that MSME actors generally believe that website adoption does not conflict with their current business processes, organizational culture, or customer interactions. Furthermore, the standard deviation value of 24.51 (1.03%) indicates very low variability in responses, meaning that respondents' perceptions are highly consistent. In other words, most MSMEs share a similar view that website-based digitalization fits well with their business context. These results highlight that perceived compatibility is an important factor supporting the adoption of digital technology, as technologies that align with existing practices are more likely to be accepted and implemented successfully by MSMEs.

Table 3. Respondents' Responses Regarding the Complexity Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		1	2	3	4	5		
Complexity	Items	1	2	3	4	5		
	CX1	0	7	23	68	53	1074	80.10%
	CX2	0	5	23	62	60	1083	80.70%
	CX3	0	10	1	60	79	1055	78.63%
Average Value of the Complexity Variable							820.67	79.88%
Standard Deviation Value							12.23	0.72%

Source: Data processed, 2023

Table 3. Respondents' Responses Regarding the Complexity Variable presents the distribution of respondents' answers regarding the Complexity variable, which reflects MSME owners' perceptions of the level of difficulty associated with adopting website-based digitalization. This variable was measured using three statement indicators (CX1–CX3) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5) across all indicators, while only a small proportion chose lower scores (1 and 2). This pattern suggests that respondents generally perceive the complexity of website adoption at a manageable level, indicating that the technology is not considered excessively difficult to understand or implement.

Among the indicators, CX2 recorded the highest percentage score (80.70%), indicating that the aspect represented by this statement is perceived as the least problematic in terms of difficulty. CX1 follows closely with a percentage of 80.10%, while CX3 obtained the lowest percentage (78.63%), although it still falls within a high category. The score values for each indicator range from 1,055 to 1,083, reflecting a concentration of responses in the “agree” and “strongly agree” categories. These findings imply that although website-based digitalization may involve certain technical challenges, MSME actors generally feel capable of coping with the required skills and operational adjustments.

The average score for the Complexity variable is 820.67, with an overall percentage of 79.88%, indicating a high level of agreement among respondents regarding the statements measuring complexity. This suggests that the perceived difficulty of website adoption does not constitute a major barrier for most MSMEs. Furthermore, the standard deviation value of 12.23 (0.72%) indicates very low variability in responses, meaning that respondents' perceptions are highly consistent. In other words, MSME actors tend to share a similar view that the complexity of website-based digitalization remains within a manageable range. These results highlight that perceived complexity, while present, is not sufficiently high to hinder adoption, suggesting that MSMEs are increasingly prepared to engage with digital technologies as part of their business development strategies.

Table 4. Respondents' Responses Regarding the Trialability Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Trialability	TR1	0	5	47	178	70	1213	80.87%
	TR2	3		48	180	67	1206	80.40%
Average Value of the Trialability Variable							1209.50	80.63%
Standard Deviation Value							4.95	0.33%

Source: Data processed, 2023

Table 4. Respondents' Responses Regarding the Trialability Variable presents the distribution of respondents' answers regarding the Trialability variable, which reflects the extent to which website-based digitalization can be tested or experimented with before full implementation by MSMEs. This variable was measured using two statement indicators (TR1–TR2) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5) for both indicators, while only a small proportion chose lower scores (1 and 2). This pattern indicates that respondents generally perceive website technology as something that can be tried on a limited basis prior to full adoption, thereby reducing uncertainty and perceived risk.

Between the two indicators, TR1 obtained a slightly higher percentage score (80.87%) compared to TR2 (80.40%), suggesting that the aspect represented by TR1 is perceived as marginally more feasible for experimentation. The score values for both indicators exceed 1,200, reflecting a strong concentration of responses in the “agree” and “strongly agree” categories. These findings imply that MSME actors feel they have opportunities to test website-based digital solutions—such as through pilot use, trial periods, or gradual implementation before committing fully to the technology.

The average score for the Trialability variable is 1,209.50, with an overall percentage of 80.63%, indicating a high level of perceived trialability among respondents. This suggests that the ability to experiment with digital tools plays an important role in encouraging MSMEs to adopt website technology. Furthermore, the standard deviation value of 4.95 (0.33%) indicates extremely low variability in responses, meaning that respondents' perceptions are highly uniform. In other words, most MSMEs share a consistent view that website-based digitalization can be tested beforehand, which helps reduce uncertainty and increases confidence in adoption decisions. These results highlight that trialability is a supportive factor in the diffusion of digital innovation, as technologies that can be experimented with prior to full implementation are more likely to be accepted by potential adopters.

Table 5. Respondents' Responses Regarding the Observability Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Observability	OB1	4	4	14	95	33	1074	78.30%
	OB2	7	6	10	97	30	1039	77.77%
	OB2	6	5	24	100	15	1012	75.97%
Average Value of the Trialability Variable							632.670	77.34%
Standard Deviation Value							16.845	1.02%%

Source: Data processed, 2023

Table 5. Respondents' Responses Regarding the Observability Variable presents the distribution of respondents' answers regarding the Observability variable, which reflects the extent to which the results and benefits of website-based digitalization are visible and noticeable to MSME actors. This variable was measured using three statement indicators (OB1–OB3) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5) across all indicators, although a slightly larger proportion of respondents chose moderate and lower scores compared to previous variables. This pattern suggests that while the outcomes of digital adoption are generally visible, they may not be equally apparent to all MSMEs.

Among the indicators, OB1 achieved the highest percentage score (78.30%), indicating that the benefits represented by this statement are the most observable to respondents. OB2 follows closely with a percentage of 77.77%, while OB3 recorded the lowest percentage at 75.97%, though it still falls within a high category. The score values for the indicators range from 1,012 to 1,074, reflecting a concentration of responses in the “agree” category, with fewer selections in the “strongly agree” category compared to earlier variables. These findings imply that although MSME actors can observe the positive outcomes of website-based digitalization—such as improved business visibility or customer reach—the magnitude or immediacy of these outcomes may vary across businesses.

The average score for the Observability variable is 632.670, with an overall percentage of 77.34%, indicating a high level of perceived observability among respondents, albeit lower than the other innovation attributes examined in this study. This suggests that the visibility of digitalization outcomes, while evident, may require time or supporting conditions to become fully apparent. Furthermore, the standard deviation value of 16.845 (1.02%) indicates low variability in responses, meaning that respondents' perceptions are relatively consistent. In other words, most MSMEs share a similar view that the benefits of website-based digitalization can be observed, even though the degree of visibility may differ. These results highlight that observability plays an important role in reinforcing adoption decisions, as visible success and tangible outcomes can encourage wider acceptance of digital technology among MSMEs.

Table 6. Respondents' Responses Regarding the IT Infrastructure Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		1	2	3	4	5		
	Items	1	2	3	4	5		
IT Infrastructure	IT1	0	0	8	82	60	1091	81.23%
	IT2	0	0	25	73	52	10866	80.90%
Average Value of the IT Infrastructure Variable							1088.50	81.07%
Standard Deviation Value							3.34	0.22%

Source: Data processed, 2023

Table 6. Respondents' Responses Regarding the IT Infrastructure Variable presents the distribution of respondents' answers regarding the IT Infrastructure variable, which reflects the availability and adequacy of technological facilities supporting website-based digitalization among MSMEs. This variable was measured using two statement indicators (IT1–IT2) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5) for both indicators, with almost no respondents choosing low scores (1 and 2). This pattern indicates that MSMEs generally perceive their IT infrastructure as sufficiently supportive of digital adoption.

Between the two indicators, IT1 recorded a slightly higher percentage score (81.23%) compared to IT2 (80.90%), suggesting that the aspect represented by IT1 is perceived as marginally more adequate. The high score values for both indicators reflect a strong concentration of responses in the “agree” and “strongly agree” categories. The average score for the IT Infrastructure variable is 1,088.50, with an overall percentage of 81.07%, indicating a high level of perceived readiness in terms of technological facilities. Furthermore, the standard deviation value of 3.34 (0.22%) indicates extremely low variability in responses, meaning that respondents' perceptions are highly consistent. Overall, these results suggest that adequate IT infrastructure serves as an important enabling factor for the successful implementation of website-based digitalization among MSMEs.

Table 7. Respondents' Responses Regarding the CEO's Innovativeness Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		1	2	3	4	5		
	Items	1	2	3	4	5		
CEO's Innovativeness	CO1	0	4	31	176	89	1100	81.83%
	CO2	0	5	75	148	72	1037	77.63%
	CO2	2	1	58	162	77	1061	79.23%
Average Value of the CEO's Innovativeness Variable							766.00	79.57%
Standard Deviation Value							29.90	2.04%

Source: Data processed, 2023

Table 7. Respondents' Responses Regarding the CEO's Innovativeness Variable presents the distribution of respondents' answers regarding the CEO's Innovativeness variable, which reflects the extent to which MSME leaders demonstrate openness to new ideas, creativity, and willingness to adopt website-based digitalization. This variable was measured using three statement indicators (CO1–CO3) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5), with only a small proportion choosing lower scores. Among the indicators, CO1 recorded the highest percentage score (81.83%), followed by CO3 (79.23%), while CO2 obtained the lowest percentage (77.63%), though it still falls within a high category. This distribution indicates that business owners generally possess a positive orientation toward innovation and technological change.

The average score for the CEO's Innovativeness variable is 766.00, with an overall percentage of 79.57%, indicating a high level of perceived innovativeness among MSME leaders. The standard deviation value of 29.90 (2.04%) suggests relatively low variability in responses, meaning that respondents' perceptions are fairly consistent. Overall, these findings imply that the innovative attitude of business leaders is an important supporting factor in the adoption of website-based digitalization, as leaders who are receptive to new technologies are more likely to initiate and sustain digital transformation within their businesses.

Table 8. Respondents' Responses Regarding the Government Support Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Government Support	GS1	47	42	11	35	15	3210	36.57%
	GS2	35	56	13	33	13	425	36.83%
Average Value of the CEO's Innovativeness Variable							423.0	36.70%
Standard Deviation Value							2.51	0.18%

Source: Data processed, 2023

Table 8. Respondents' Responses Regarding the Government Support Variable presents the distribution of respondents' answers regarding the Government Support variable, which reflects the extent to which MSMEs perceive assistance, policies, and facilitation from the government in supporting website-based digitalization. This variable was measured using two statement indicators (GS1–GS2) on a five-point Likert scale, where higher scores indicate stronger agreement. In contrast to previous variables, the results show that many respondents selected lower response categories (scores 1 and 2), while fewer respondents chose high scores (4 and 5). GS2 recorded a slightly higher percentage score (36.83%) than GS1 (36.57%), yet both values remain in a relatively low category. This distribution indicates that government support for digital adoption is perceived as limited or insufficient by most MSME actors.

The average score for the Government Support variable is 423.0, with an overall percentage of 36.70%, indicating a low level of perceived support from government institutions. The standard deviation value of 2.51 (0.18%) suggests very low variability in responses, meaning that respondents share a highly consistent perception regarding the lack

of support. Overall, these findings imply that insufficient government assistance—such as limited training programs, financial incentives, or infrastructure facilitation—may hinder the acceleration of website-based digitalization among MSMEs, highlighting the need for stronger policy interventions to promote digital transformation in this sector.

Table 9. Respondents' Responses Regarding the Environmental Uncertainty Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Environmental Uncertainty	EU1	2	9	30	92	17	1066	79.57%
	EU2	2	4	19	45	80	1145	84.90%
Average Value of the Environmental Uncertainty Variable							756.00	82.23%
Standard Deviation Value							55.07	3.53%

Source: Data processed, 2023

Table 9. Respondents' Responses Regarding the Environmental Uncertainty Variable presents the distribution of respondents' answers regarding the Environmental Uncertainty variable, which reflects the extent to which MSMEs perceive changes and unpredictability in the external business environment, such as market dynamics, competition, and technological developments. This variable was measured using two statement indicators (EU1–EU2) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5), indicating that MSME actors generally perceive their business environment as uncertain and rapidly changing. Among the indicators, EU2 recorded a higher percentage score (84.90%) compared to EU1 (79.57%), suggesting that the aspect represented by EU2 is perceived as more strongly associated with environmental uncertainty.

The average score for the Environmental Uncertainty variable is 756.00, with an overall percentage of 82.23%, indicating a high level of perceived uncertainty among respondents. The standard deviation value of 55.07 (3.53%) shows moderate variability compared to other variables, suggesting that while perceptions are generally similar, some differences exist among MSMEs regarding the degree of environmental instability they face. Overall, these findings imply that a dynamic and uncertain business environment may act as a driving force for website-based digitalization, as MSMEs seek adaptive strategies and technological solutions to remain competitive and responsive to external changes.

Table 10. Respondents' Responses Regarding the Pavlovian Conditioning Variable

Variable	Statement	Alternative Answers					Score Value	Percentage
		Items	1	2	3	4		
Pavlovian Conditioning	PC1	2	1	2	115	40	1169	81.43%
	PC2	0	1	22	83	44	1317	86.30%
Average Value of the Environmental Uncertainty Variable							1268.00	86.37%
Standard Deviation Value							1.32	0.07%

Source: Data processed, 2023

Table 10. Respondents' Responses Regarding the Pavlovian Conditioning Variable presents the distribution of respondents' answers regarding the Pavlovian Conditioning variable, which reflects the extent to which MSME actors' adoption of website-based digitalization is influenced by habitual responses, repeated exposure, or associative learning from prior experiences. This variable was measured using two statement indicators (PC1–PC2) on a five-point Likert scale, where higher scores indicate stronger agreement. The results show that most respondents selected high response categories (scores 4 and 5), indicating that behavioral reinforcement and repeated positive experiences play an important role in encouraging digital adoption. PC2 recorded a higher percentage score (86.30%) compared to PC1 (81.43%), suggesting that the aspect represented by PC2 is more strongly perceived as influencing respondents' behavior.

The average score for the Pavlovian Conditioning variable is 1,268.00, with an overall percentage of 86.37%, indicating a very high level of agreement among respondents. The standard deviation value of 1.32 (0.07%) indicates extremely low variability in responses, meaning that perceptions are highly consistent across respondents. Overall, these findings suggest that conditioning effects—such as familiarity with digital tools, repeated successful use, or exposure to similar technologies—serve as strong drivers of website-based digitalization among MSMEs, reinforcing adoption behavior through learned positive associations.

It is evident from the preceding table that respondents rated the Pavlovian Conditioning variable with an average value of 1268.00 ± 1.32 or 86.37% and a standard deviation value of 0.07% with an ideal value of 1500 (100%). Meanwhile, the range of total scores given by respondents to the Pavlovian Conditioning Variable was between 1169 (81.43%) – 1317 (86.30%), with the PC1 statement item receiving the highest score and the PC2 statement item receiving the lowest.

The results of the measurement model test for exogenous constructs can be seen through the loading factor coefficient values for each indicator which are presented in the following table.

Table 11. Respondents' Responses Regarding the Pavlovian Conditioning Variable

Variable Laten	Variable Manifest	λ	λ^2	e	CR	VE
Relative Advantage	RA1	0.665	0.452	0.226	0.823	0.536
	RA2	0.699	0.469	0.211		
	RA3	0.629	0.665	0.313		
	RA4	0.542	0.221	0.449		
	RA5	0.500	0.490	0.210		
Compatibility	CT1	0.665	0.262	0.416	0.765	0.662
	CT2	0.632	0.695	0.303		
	CT3	0.661	0.556	0.224		
Complexity	CX1	0.636	0.502	0.296	0.844	0.642
	CX2	0.621	0.524	0.256		
	CX3	0.513	0.206	0.492		
Trialability	TR1	0.633	0.694	0.296	0.715	0.691
	TR2	0.629	0.524	0.313		
Observability	OB1	0.606	0.623	0.345	0.724	0.666
	OB2	0.969	0.939	0.061		
	OB3	0.513	0.411	0.269		
IT Infrastructure	IT1	0.605	0.621	0.349	0.960	0.565
	IT2	0.961	0.924	0.056		
CEO's Innovativeness	CO1	0.606	0.466	0.234	0.724	0.526
	CO2	0.563	0.262	0.416		
	CO3	0.532	0.236	0.464		
Government Support	GS1	0.926	0.661	0.139	0.960	0.511
	GS2	0.549	0.261	0.439		
Environmental	EU1	0.692	0.4631	0.215	0.796	0.532
Uncertainty	EU2	0.566	0.265	0.413		

Source: Data processed, 2023

This study adopts an integrated theoretical framework combining the Technology–Organization–Environment (TOE) model and the Diffusion of Innovation (DOI) theory to comprehensively analyze the determinants of MSME digital adoption. The TOE framework examines adoption factors from three dimensions: technological (IT infrastructure),

organizational (CEO innovativeness), and environmental (government support and environmental uncertainty). Meanwhile, DOI theory captures innovation characteristics influencing adoption behavior, including Relative Advantage, Compatibility, Complexity, Trialability, and Observability. The integration of TOE and DOI enables a multidimensional analysis that connects contextual readiness with perceived innovation attributes.

This research employs a quantitative approach using structured questionnaires distributed to 420 MSME respondents. The data were tested for validity and reliability using SPSS version 2023 before being analyzed through Structural Equation Modeling (SEM) to examine the relationships among variables. Furthermore, Table 11, which presents respondents' responses regarding the Pavlovian Conditioning variable, indicates that each observed variable has a loading factor (λ) greater than 0.5. This finding confirms that all indicators significantly contribute to their respective exogenous constructs. To ensure robust construct validity and reliability, the evaluation also considers the Variance Extracted (VE) and Construct Reliability (CR) values. The results show that VE values exceed 0.5 and CR values are greater than 0.7, demonstrating satisfactory convergent validity and internal consistency. Therefore, all exogenous constructs, including Pavlovian Conditioning, meet the recommended measurement standards and are appropriate.

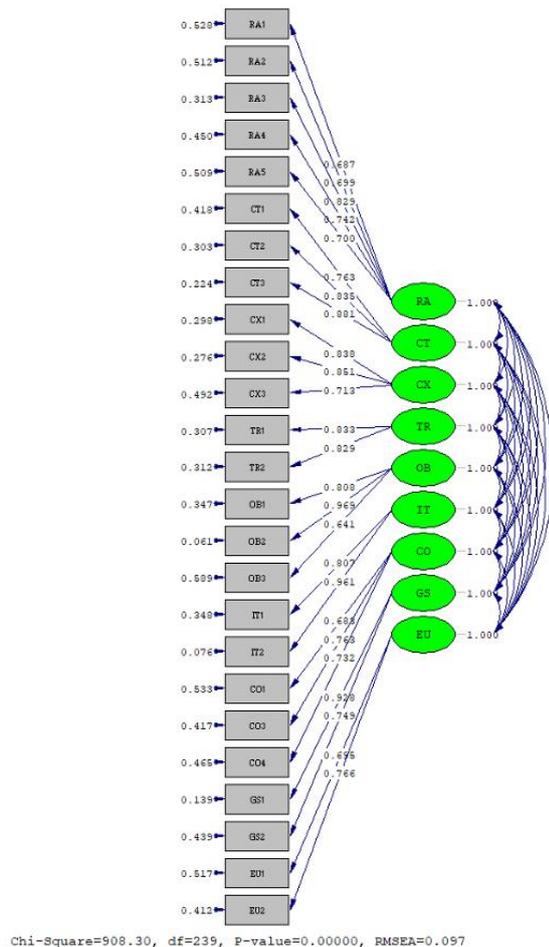


Figure 2 . Exogenous Construct Measurement Model

Source: Lisrel Output, 2023

The figure 2. Exogenous Construct Measurement Model presents the measurement model (outer model) using Structural Equation Modeling (SEM) with LISREL, illustrating the relationships between observed indicators and their respective latent constructs.

The green circles (RA, CT, CX, TR, OB, IT, CO, GS, EU) represent latent variables, while the rectangular boxes (e.g., RA1–EU2) represent observed indicators. The arrows from the latent constructs to the indicators indicate factor loadings (λ values), which reflect how strongly each indicator explains its corresponding construct. Most loading factor values are above 0.5, indicating that the indicators adequately represent their latent variables. This supports acceptable convergent validity, as indicators with loadings greater than 0.5 are considered meaningful contributors to the construct.

The covariance relationships among latent variables are illustrated by the curved double-headed arrows on the right side of the model, indicating correlations between exogenous constructs. This suggests that the TOE and DOI variables are theoretically related but remain distinct constructs within the integrated framework. At the bottom of the figure, the goodness-of-fit indices are reported: Chi-Square = 908.30, $df = 239$, $p\text{-value} = 0.00000$, and $RMSEA = 0.097$. The significant Chi-Square value indicates some discrepancy between the model and the data, which is common in large samples ($n = 420$). The RMSEA value of 0.097 suggests a marginal to moderate model fit, slightly above the commonly recommended threshold of 0.08. This indicates that while the measurement model is acceptable, further refinement could improve model fit. Overall, the model demonstrates adequate construct validity and reliability, supporting the suitability of the latent constructs for subsequent structural model analysis.

Table 12. Measurement Model

Variable	Estimate	T-stat	t table	Explanation
RA	0.211	5.232	1.96	Significant
CT	0.325	3.06	1.96	Significant
CX	-0.234	-1.270	1.96	Not Significant
TR	0.403	1.569	1.96	Significant
OB	0.047	0.651	1.96	Not Significant
IT	0.006	0.248	1.96	Not Significant
CO	-0.031	-0.779	1.96	Not Significant
GS	0.258	1.742	1.96	Significant
EU	0.210	2.521	1.96	Significant

Source: Lisrel Output, 2023

Table 12. Measurement Model presents the results of the structural model analysis, showing the path coefficients (estimates), T-statistics, and significance levels of the relationships between exogenous variables and Pavlovian Conditioning (PC). The critical t-table value used is 1.96 ($\alpha = 0.05$). The results indicate that Relative Advantage (RA) has a

positive and significant effect on PC ($\beta = 0.211$; $T = 5.232 > 1.96$), suggesting that perceived benefits strongly influence conditioned digital adoption behavior. Compatibility (CT) also shows a positive and significant effect ($\beta = 0.325$; $T = 3.06$), indicating that alignment with existing business processes enhances the conditioning effect. Similarly, Trialability (TR) demonstrates a positive and significant relationship ($\beta = 0.403$), implying that opportunities for experimentation strengthen behavioral reinforcement.

From the environmental context, Government Support (GS) ($\beta = 0.258$; $T = 1.742$) and Environmental Uncertainty (EU) ($\beta = 0.210$; $T = 2.521$) are reported as significant, highlighting the important role of external pressures and institutional support in stimulating conditioned digital behavior. Conversely, Complexity (CX) ($\beta = -0.234$), Observability (OB) ($\beta = 0.047$), IT Infrastructure (IT) ($\beta = 0.006$), and CEO Innovativeness (CO) ($\beta = -0.031$) do not show significant effects ($T < 1.96$). These findings indicate that organizational readiness and perceived difficulty are less influential compared to perceived benefits and environmental drivers in shaping Pavlovian-based digital adoption among MSMEs.

Overall, the results emphasize that perceptual and environmental factors play a more dominant role than internal organizational characteristics in influencing conditioned digital transformation behavior.

Table 13. Testing of Research Models for Fit Quality

Parameter	Acceptable Match Level	Model Index	Explanation
GFI	$GFI \geq 0.9$ (fit quality), $0.8 \leq GFI \leq 0.9$ (marginal fit)	0,856	Marjinal Fit
RMR	$RMR \leq 0.5$	0.052	Fit Quality
RMSEA	$0.05 < RMSEA \leq 0.08$ (fit quality), $0.08 < RMSEA \leq 1$ (marginal fit)	0.082	Marjinal Fit
NNFI	$NNFI \geq 0.9$ (fit quality), $0.8 \leq NNFI \leq 0.9$ (marginal fit)	0.921	Fit Quality
NFI	$NFI \geq 0.9$ (fit quality), $0.8 \leq NFI \leq 0.9$ (marginal fit)	0.987	Fit Quality
AGFI	$AGFI \geq 0.9$ (fit quality), $0.8 \leq AGFI \leq 0.9$ (marginal fit)	0,876	Marjinal Fit
RFI	$RFI \geq 0.9$ (fit quality), $0.8 \geq RFI \leq 0.9$ (marginal fit)	0.909	Fit Quality
CFI	$CFI \geq 0.9$ (fit quality), $0.8 \leq CFI \leq 0.9$ (marginal fit)	0.971	Fit Quality

Source: Data processed, 2023

Table 13. Testing of Research Models for Fit Quality presents the overall goodness-of-fit evaluation of the research model using several fit indices to assess how well the proposed SEM model matches the empirical data. The Goodness of Fit Index (GFI) value is 0.856, which falls within the marginal fit category ($0.8 \leq GFI \leq 0.9$). Similarly, the Adjusted

Goodness of Fit Index (AGFI) value of 0.876 also indicates marginal fit. These results suggest that although the model does not achieve the ideal threshold (≥ 0.90), it still demonstrates an acceptable level of fit. The Root Mean Square Residual (RMR) value is 0.052, which is below the recommended threshold, indicating good fit quality. The Root Mean Square Error of Approximation (RMSEA) value is 0.082, slightly above the preferred upper limit of 0.08, placing it in the marginal fit category. This suggests that the model has moderate approximation error but remains within an acceptable range. Incremental fit indices show stronger performance. The NNFI (0.921), NFI (0.987), RFI (0.909), and CFI (0.971) all exceed the recommended threshold of 0.90, indicating good fit quality. These values demonstrate that the proposed model significantly improves fit compared to the null model. Overall, although several absolute fit indices indicate marginal fit, the strong incremental fit indices confirm that the research model is generally acceptable and suitable for hypothesis testing and structural analysis. Despite three indicators falling below the marginal fit criterion, the model fits well overall, as shown in the summary table of the model's goodness of fit. The research model is therefore classified as having a good fit.

CONCLUSIONS

Based on the data analysis and discussion in the previous chapter, several important inferences can be drawn regarding the factors influencing website adoption using the Pavlovian Conditioning Method. The results indicate that government support, trialability, compatibility, relative advantage, and environmental uncertainty have a positive and significant influence on website adoption, with relative advantage emerging as the most dominant factor, suggesting that users are more likely to adopt websites when they perceive clear benefits compared to conventional methods. Compatibility also shows a significant positive effect, indicating that alignment between website features and users' existing habits, needs, and preferences plays a crucial role in encouraging adoption. Trialability further strengthens adoption decisions, as opportunities for users to test and experience website features directly increase familiarity and positive responses through conditioning processes. In contrast, complexity does not demonstrate a significant influence, implying that perceived difficulty does not substantially hinder adoption, possibly due to supportive interface design or user guidance that reduces perceived barriers. Meanwhile, observability, IT infrastructure, and CEO innovativeness show positive but statistically insignificant effects, suggesting that although these factors support adoption, their influence is not strong enough to be considered decisive. On the other hand, external factors such as government support and environmental uncertainty significantly contribute to adoption decisions, highlighting the importance of policy encouragement and market dynamics in shaping user behavior. Overall, the findings emphasize that perceived benefits, compatibility with user expectations, and opportunities for direct experience are key drivers of website adoption within the Pavlovian Conditioning framework, providing valuable insights for businesses and policymakers to enhance adoption strategies by focusing on user-centered design, reducing perceived barriers, and strengthening external support mechanisms. For future research, it is recommended to expand the research scope by involving more diverse MSME sectors, incorporating longitudinal approaches to observe long-term adoption behavior, and integrating qualitative methods to gain deeper insights into decision-making processes. Such improvements may strengthen the explanatory power of future studies and provide a more comprehensive understanding of MSME digital transformation.

REFERENCES

- Al Nuaimi, F. M. S., Singh, S. K., & Ahmad, S. Z. (2023). Open Innovation in SMEs: a Dynamic Capabilities Perspective. *Journal of Knowledge Management*, 28(2), 484–504. <https://doi.org/10.1108/JKM-11-2022-0906>
- Amini, M., & Javid, N. J. (2023). A Multi-Perspective Framework Established on Diffusion of Innovation (DOI) Theory and Technology, Organization and Environment (TOE) Framework Toward Supply Chain Management System Based on Cloud Computing Technology for Small and Medium Enterprises. *International Journal of Information Technology and Innovation Adoption*, 11(8), 1217–1234. <https://ssrn.com/abstract=4340207>
- Atobatele, O. K., Ajayi, O. O., Hungbo, A. Q., & Adeyemi, C. (2021). Applying Agile and Scrum Methodologies to Improve Public Health Informatics Project Implementation and Delivery. *Journal of Frontiers in Multidisciplinary Research*, 2(1), 426–439. <https://doi.org/10.54660/jfmr.2021.2.1.426-439>
- De Keyser, Arne, Verleye, Katrien, Lemon, Katherine N, Keiningham, Timothy L, & Klaus, Philipp. (2020). Moving the Customer Experience Field Forward: Introducing the Touchpoints, Context, Qualities (TCQ) Nomenclature. *Journal of Service Research*, 23(4), 433–455. <https://doi.org/10.1177/1094670520928390>
- Denning, S. (2021). A Powerful Diagnostic Tool for 21st Century Management. *Strategy & Leadership*, 49(1), 3–9. <https://doi.org/10.1108/SL-12-2020-0161>
- Dey, K. S., & Tanty, G. (2022). SETTING THE FUTURE OF COMPLETE DIGITAL AND SOCIAL MEDIA MARKETING RESEARCH: PERSPECTIVES AND RESEARCH PROPOSITIONS. *JOURNAL OF MANAGEMENT & ENTREPRENEURSHIP*, 16(2 (IV)), 105–112.
- Dwivedi, Y. K., Ismagilova, E., Hughes, D. L., Carlson, J., Filieri, R., Jacobson, J., Jain, V., Karjaluoto, H., Kefi, H., Krishen, A. S., Kumar, V., Rahman, M. M., Raman, R., Rauschnabel, P. A., Rowley, J., Salo, J., Tran, G. A., & Wang, Y. (2021). Setting the Future of Digital and Social Media Marketing Research: Perspectives and Research Propositions. *International Journal of Information Management*, 59, 1–37. <https://doi.org/10.1016/j.ijinfomgt.2020.102168>
- Gemino, Andrew, Horner Reich, Blaize, & Serrador, Pedro M. (2020). Agile, Traditional, and Hybrid Approaches to Project Success: Is Hybrid a Poor Second Choice? *Project Management Journal*, 52(2), 161–175. <https://doi.org/10.1177/8756972820973082>
- Hentati, A., Forsell, E., Ljótsson, B., Kaldo, V., Lindefors, N., & Kraepelien, M. (2021). The Effect of User Interface on Treatment Engagement in a Self-guided Digital Problem-solving Intervention: A Randomized Controlled Trial. *Internet Interventions*, 26, 100448. <https://doi.org/https://doi.org/10.1016/j.invent.2021.100448>
- Hoang, H. (2024). Navigating the Digital Landscape: An Exploration of the Relationship Between Technology-Organization-Environment Factors and Digital Transformation Adoption in SMEs. *SAGE Open*, 14(4), 1–19. <https://doi.org/10.1177/21582440241276198>
- Jake-Schoffman, D. E., & McVay, M. A. (2021). Using the Design Sprint Process to Enhance and Accelerate Behavioral Medicine Progress: A Case Study and Guidance. *Translational Behavioral Medicine*, 11(5), 1099–1106. <https://doi.org/10.1093/tbm/ibaa100>

- Klaus, P., & Zaichkowsky, J. L. (2021). The Convenience of Chopping Via Voice AI: Introducing AIDM. *Journal of Retailing and Consumer Services*, 65, 102490. <https://doi.org/https://doi.org/10.1016/j.jretconser.2021.102490>
- Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital Transformation in Business and Management Research: An Overview of the Current Status Quo. *International Journal of Information Management*, 63, 1–18. <https://doi.org/https://doi.org/10.1016/j.ijinfomgt.2021.102466>
- Landjohou, G., & Christopher, E. (2026). The Impact of Digital Marketing on Small and Medium Enterprises (SMEs) Growth: A Systematic Review. *International Journal on Recent Trends in Business and Tourism*, 10(01), 01–18. <https://doi.org/10.31674/ijrtbt.2026.v010i01.001>
- Naibaho, R., Effiyaldi, Nurhadi, Suratno, E., & Paul Karolus Pasaribu, J. (2025). Adoption of Digital Technology and Sales Performance Improvement among Indonesian SMEs: A Mixed-Methods Analysis. *Quantitative Economics and Management Studies (QEMS)*, 6(2), 205–218. <https://doi.org/10.35877/454RI.qems>
- Ocloo, C. E., Xuhua, H., Akaba, S., Shi, J., & Worwui-Brown, D. K. (2020). The Determinant Factors of Business to Business (B2B) E-Commerce Adoption in Small- and Medium-Sized Manufacturing Enterprises. *Journal of Global Information Technology Management*, 23(3), 191–216. <https://doi.org/10.1080/1097198X.2020.1792229>
- Priyadarshini, A. P. (2024). The Impact of User Interface Design on User Engagement. *International Journal of Engineering Research & Technology (IJERT)*, 13(3). <https://doi.org/DOI:https://doi.org/10.5281/zenodo.18146084>
- Schwaber, K., & Sutherland, J. (2020). *DER VISUELLE SCRUM GUIDE*. Scrum Alliance. www.leadventure.de
- Verhoef, P. C., Broekhuizen, T., Bart, Y., Bhattacharya, A., Qi Dong, J., Fabian, N., & Haenlein, M. (2021). Digital Transformation: A Multidisciplinary Reflection and Research Agenda. *Journal of Business Research*, 122, 889–901. <https://doi.org/10.1016/j.jbusres.2019.09.022>
- Vial, G. (2021). Understanding Digital Transformation: A Review and A Research Agenda. *Journal of Strategic Information Systems*, 28(2), 118–144. <https://doi.org/10.1016/j.jsis.2019.01.003>



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 20 No. 1, 2026 (February), 95-110



THE COMPETITIVENESS OF NATIONAL SOLAR MODULES IN THE RESIDENTIAL MARKET: PERSPECTIVE OF EPC COMPANIES

Dwi Nurma Heitasari¹⁾, Ibnu Lukman Pratama²⁾,
Qonita Hana Insyira³⁾

^{1,2,3} Politeknik Energi dan Mineral Akamigas, Bloro, Indonesia
Email: dwinurmaheitasari1987@gmail.com



SINTA 2

DOI: <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p06>

ABSTRACT

Indonesia has substantial potential for solar energy development, supported by abundant silica sand, a key raw material for solar module production. However, solar energy adoption in the residential sector remains below national targets, despite this sector being the largest electricity consumer. Engineering, Procurement, and Construction (EPC) companies play a crucial role in selecting solar modules, whether national or imported. This study analyses EPC companies' perspectives on sourcing solar modules in the Indonesian residential market. Data obtained from experienced EPC professionals and analysed using the Analytic Hierarchy Process (AHP) using Expert Choice software. The results indicate that cost related considerations dominate procurement decisions. Although national solar modules show advantages in delivery reliability, they remain less competitive than imported products across most evaluation criteria. Strengthening research and development efforts and implementing effective cost reduction strategies are essential to improving the competitiveness of national solar modules.

Keywords: national; solar; modules; residential; criteria.

INTRODUCTION

The use of fossil fuels is becoming increasingly intensive due to the high reliance on limited reserves, which is inversely proportional to Indonesia's final energy consumption. Data review of the 2023 energy balances of Indonesia reveals that the overwhelming majority of the final energy consumption level is attributable to fossil fuels, with coal (34,83%), petroleum product (32,43%), gas (13,64%), natural gas (8,20%), and electricity include renewable energy source (15.56%) comprising the majority of this consumption (Central Bureau of Statistics of Indonesia, 2024). In parallel, the issue of converting energy from fossil fuels to renewable sources has attracted considerable attention. Indonesia has enormous solar energy potential, ranging from 3,300 to 20,000 Gigawatts (GW), making it one of the countries with the largest solar energy reserves in the world. However, the realisation of this potential remains very minimal.

One of the primary obstacles to greater solar energy utilisation is the continued high cost compared to fossil fuels. To analyse and assess the energy sector, the LCOE (Levelized Cost of Energy) provides an average cost of energy, enabling comparisons and supporting

decision-making in a financially viable manner (Emblemsvåg, 2025). In Indonesia, as in the rest of the world, the costs of renewable energy sources are considered high.

A study by the National Renewable Energy Laboratory confirms that Indonesia has the highest average LCOE among ASEAN member states at 165 USD/MWh, significantly lower than Burma's average of 79 USD/MWh. The levelized cost of electricity (LCOE) for renewable sources such as solar and wind in ASEAN countries like Malaysia and Thailand ranges from 59 to 98 USD/MWh. It is lower than the same number for Indonesia (Institute for Essential Services Reform, 2019); (National Renewable Energy Laboratory - United States Agency International Development, 2020). It shows that solar energy is still significantly more expensive to implement initially. Most of these costs (47%) are allocated to solar module costs (Dehghanimadvar et al., 2022). It is ironic to observe such low adoption of solar modules in Indonesia, given that the country has reserves of silica sand totaling 332,113 kilotons, the primary material used in solar module construction (Center for Mineral, Coal, and Geothermal Resources, 2021).

As most of Indonesia's electricity consumption comes from the residential sector (Secretariat General of the National Energy Council, 2023), the sector needs to adopt domestic solar modules as a step toward sustainable development. However, for solar modules, the Domestic Component Level (DCL) has not been fully realised due to issues related to product quality and economics. Therefore, it is important to understand the factors that influence the decisions made by Engineering, Procurement and Construction (EPC) companies. The EPC company performs project planning and design activities before construction commences. In the solar panel industry, the EPC role is to oversee the construction of both large and small-scale solar power plants.

National products are defined as items manufactured by businesses that operate and invest in Indonesia, even if they use imported components in their production. It is clear from these definitions that companies that invest in Indonesia must make domestic products there, meet DCL minimum standards of 25%, and allow both imported and domestic parts, as long as they are made and put together in Indonesia (Presidential Regulation of the Republic of Indonesia Number 46 of 2025 Concerning the Second Amendment to Presidential Regulation Number 16 of 2018 Concerning Government Procurement of Goods/Services, 2025). The source of each part comes after the DCL proportion and production site in Indonesian law. If a solar module meets the 25% DCL requirements, it can be considered a "domestic product," even if most of its parts come from other countries and the module is manufactured in Indonesia. Modules that do not contain any parts from the country where they were made are considered fully imported, regardless of where they come from. This difference is important for understanding EPC's buying strategy, which may include a mix of fully imported modules and modules made in the U.S. with varying levels of foreign content.

This study aims to identify discrepancies between domestic and foreign solar module products and their ability to meet the demands of the existing market. An improvement plan can be formulated for the national product, solar modules, by identifying these gaps. Most current research on renewable energy implementation in Indonesia has focused on macro level policy analysis and the effects of these policies on project viability. One such analysis examines the impact of fiscal policies on the feasibility of solar photovoltaic (PV) and wind projects in Indonesia; it shows that policy provisions such as tax holidays and tax allowances can most effectively reduce power costs (Halimatussadiyah et al., 2023).

EPC firms decide whether to own the product. Similarly, even though the energy sector has started to implement what are considered to be innovative strategic frameworks for the management of green supply chains, using higher order soft-system thinking based approaches, the focus has been on the development of strategic frameworks to obtain and implement broader green management practices, as opposed to examining the competitive position of specific products at the operational procurement level (Dhumras & Bajaj, 2024). Furthermore, extensive techno economic evaluations of prospective residential rooftop photovoltaics have been undertaken; however, user centric analyses of self consumed electricity, within the context of end-user electricity self consumption, overlook supply-side procurement choices and fail to distinguish between domestic and imported solar PV modules (Saez et al., 2023).

All the research has pointed to the same significant gap: the absence of analysis connecting the EPC operational perspective to the competitive relationship between domestic and imported products in the residential solar market. The research on how EPC companies, important gatekeepers in the solar module supply chain, choose and purchase products made in the country versus those made abroad is limited. There is also no research on the standards and performance gaps that explain why national solar modules are not competitive in the Indonesian residential market. This gap is especially important because of the Indonesian government's ambitions for local manufacturing and renewable energy, as well as the Indonesian DCL legislation.

This research addresses existing gaps by, first, focusing on the EPC perspective to provide an understanding of procurement as the decisive linkage between manufacturers and end-users; second, addressing multi-criteria procurement decisions via the Analytic Hierarchy Process (AHP) to compare the procurement criteria within a rational framework; third, conducting a comprehensive competitive gap analysis in relation to the criteria and sub-criteria to identify specific performance gaps between domestic and imported solar modules; and forth, contributing to the achievement of energy independence for Indonesia by providing specific recommendations geared to improving the competitiveness of domestic products in the residential market. This study contributes to the understanding of the dynamics of procurement in the downstream energy transition in Indonesia. It provides EPC firms, manufacturers, and regulators with tools to foster national innovation.

METHODS

This research examines the competitiveness of solar modules in the residential market from the perspective of EPC enterprises, using a mixed methods approach that integrates qualitative and quantitative research methodologies (Fàbregues et al., 2024). This integrative technique is suitable due to the intricate nature of decision-making in procurement within the solar energy industry. The complexity arises from its technological, economic, supply chain, and strategic elements, which cannot be comprehended from a unique perspective. It provides both academically robust and pragmatically valuable evidence for stakeholders in the Indonesian residential solar photovoltaic sector.

The study uses an exploratory sequential design. Qualitative data are collected from semi structured interviews to create and confirm decision criteria, followed by the quantitative phase (Campbell et al., 2020). Research found that 25.6% of AHP publications in Scopus over the last 40 years have been focused on engineering (Madzik & Falát, 2022). The research commences with concurrent investigations conducted alongside a literature review and a field study. It closely examines current theoretical frameworks, methodologies, and empirical data

regarding the competitiveness of solar modules, the decision-making process involving multiple criteria, and the procurement of renewable energy-related products that align with these observations. Figure 1 illustrates the research process employs a systematic, multitiered framework to achieve both methodological and practical relevance. The systematic approach of this research is illustrated in the flowchart below.

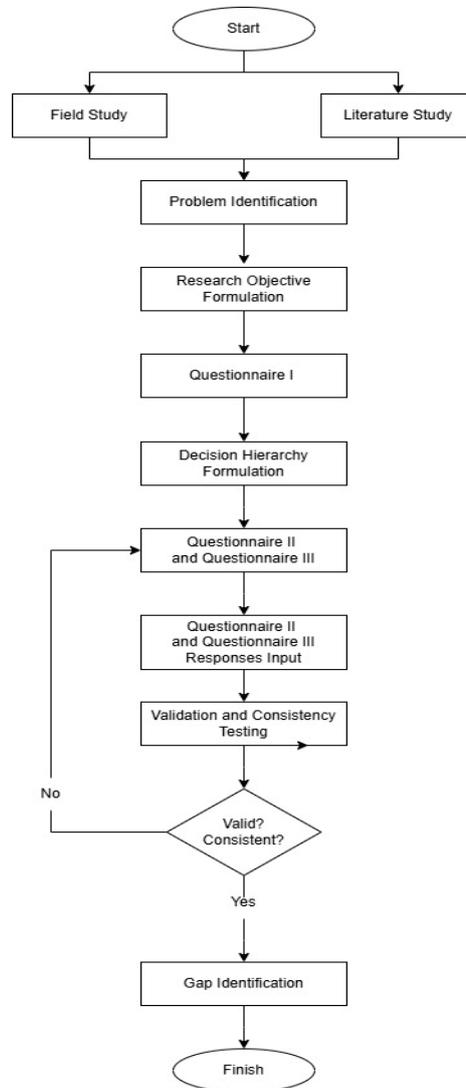


Figure 1. Research Flowchart

Source: Developed by authors, 2025

The study included ten experts from seven Indonesian solar EPC companies. The main solar PV markets in Indonesia, Java, Bali, and Kalimantan are enough for this study (Ministry of Energy and Minerals Indonesia, 2024, The Directorate General of New Renewable Energy and Energy Conservation, 2024). Companies that wanted to take part had to build more than 10 solar power plants with a total capacity exceeding 1 MW. According to AHP inquiry standards (Darko et al., 2019), companies that want to participate must have sufficient market experience and business operations to assess how competitive a module is. All responders are solar energy professionals with 4–20 years of experience in engineering and procurement roles,

whose companies supported the Ministry of Energy and Mineral Resources' Solar Power Initiative Movement Program. This experience range ensures the sample includes both new industry experts and seasoned experts with experience in historical market evolution. Standard AHP investigations require expert responses with topic knowledge for valid multi-criteria assessments (Darko et al., 2019). Table 1 presents the comprehensive profile of participating companies and respondents, demonstrating the sample's diversity across multiple dimensions.

Table 1. Participating Companies and Respondents

Company Code	Region	Firm Size (Employees)	Residential Market Focus	Respondents	Division (Experience)
EPC-1	Java	Medium (50-100)	High (>60%)	2	Engineering and Procurement (5-15 years)
EPC-2	Java	Large (>100)	Medium (40-60%)	1	Procurement (8 years)
EPC-3	Bali	Medium (50-100)	High (>60%)	1	Engineering (12 years)
EPC-4	Java	Large (>100)	Medium (40-60%)	2	Engineering and Procurement (5-18 years)
EPC-5	Kalimantan	Medium (50-100)	Low (40%)	1	Engineering (6 years)
EPC-6	Java	Large (>100)	High (>60%)	2	Engineering and Procurement (4-18 years)
EPC-7	Java	Medium (50-100)	Medium (40-60%)	1	Procurement (10 years)

Source: Data processed, 2025

The sample composition, with 57% medium-sized organizations and 43% large firms, matches Indonesia's EPC market, where medium and large sized firms play substantial roles in residential solar installations. The Solar Power Initiative Movement Program is being developed in Java (5 companies), Bali (1 company), and Kalimantan (1 company). These are the places with the most home solar installations. The sample contains both low (<40%) and high (>60%) specialization in the residential market, which yields different views on business strategies and approaches in the industry.

Questionnaire I is sent to the chosen expert, along with answers from the EPC firms participating. The goal of this semi-structured questionnaire is to gather information about customer preferences, common module specifications, and market trends. The interview questions were meant to be open-ended and cover the decision-making processes, the criteria for choosing modules, the competition between suppliers (advantages and disadvantages), and the experiences of performance brands (modules from both domestic and foreign manufacturers). Questionnaires II and III are used to assign weights to each listed criterion and sub-criterion. Saaty's basic scale, which ranges from 1 (equal importance) to 9 (extreme importance), is used for comparisons, as shown in Table 2. Saaty's Pairwise Comparison Scale (T. L. Saaty, 2001) (Salomon & Gomes, 2024).

Table 2. Saaty's Pairwise Comparison Scale

Scale	Compare Factor
1	Equal Significance
3	Moderately Significant
5	High Significance
7	Extremely Important
9	Extremely Important
2, 4, 6, 8	Values near the middle of the adjacent scale

Source: Data processed, 2025

This systematic comparison across all sub-criteria allows for multiple evaluations of alternative competitiveness. All respondent-derived pairwise comparison matrices undergo multiple consistency checks to ensure the logic and reliability of the judgments. The Consistency Ratio (CR), an AHP construct of Saaty that measures consistency and helps find paired preference contradictions (T. Saaty, 2008); (Kuo & Chen, 2023), is used to give credit to respondents' degree of consistency with a CR exceeding 0.10 indicates a logical inconsistency, necessitating adjustments to enhance the reliability of the prioritisation estimates (Tavana et al., 2023).

RESULT AND DISCUSSION

The National Energy Council's Secretariat General says that homes in Indonesia use more than 10.1 million Tons of Oil Equivalent (TOE) of energy every year (Secretariat General of the National Energy Council, 2023), making them the country's biggest power users. The need for so much energy is due to a growing population and more electrical appliances in homes, such as air conditioners, water pumps, washing machines, refrigerators, lighting systems, and electric stoves. People use energy in their homes less often and in smaller amounts than businesses and factories do, which is more predictable and focused. Table 3 shows the decision-making framework that EPC companies use to buy solar modules for homes.

Table 3. Criteria and Sub-Criteria in Sourcing Solar Modules

No	Criteria	Sub Criteria
1.	Product Quality	1. Module Efficiency
		2. Peak Wattage
		3. Product Innovation
2.	Cost	1. Solar Module Price
		2. Shipping Cost
3.	Customer Service	1. Product Availability
		2. Product Warranty
4.	Risk Management	1. On-Time Delivery
		2. After Sales Service
5.	Supplier Characteristics	1. Product Tier
		2. Supplier Relationship

Source: Data processed, 2025

The operational definitions of Table 3 are delineated as follows. Product Quality consists of module efficiency, cost, customer service, risk management, and supplier characteristics. Module efficiency denotes the conversion rate of solar irradiance to electrical energy (%), assessed under standard test conditions (1000 W/m², 25°C) (Demir et al., 2024); Peak Wattage signifies the highest possible power output under STC, expressed in watts peak (Wp); and Product Innovation pertains to the incorporation of advanced technologies and designs that improve performance or installation versatility. Cost includes solar module price indicates the unit cost per watt peak at the time of purchase, excluding shipping charges (Ishizaka & Mu, 2023). In contrast, Shipping Cost includes the total logistical expenses from the supplier's location to the designated site, or as a percentage of the module cost, covering freight charges, customs duties, and insurance. Customer Service includes product availability evaluates the supplier's capacity to meet order quantities within designated timeframes, measured by lead time (weeks) and historical order fulfilment rate (%) (Tavana et al., 2023). In contrast, Product Warranty delineates the period during which the product warranty covers manufacturing defects, and the performance warranty ensures that power output degradation remains within specified thresholds throughout the module's operational lifespan. Risk Management includes on-time delivery tells you what percentage of orders were delivered on time; after-sales service checks how well the supplier can handle problems that come up after delivery by looking at the time it takes to respond to claims, the percentage of warranty approvals, and the time it takes to send a replacement. Supplier characteristics refers to the classification system used by Bloomberg New Energy Finance (BNEF), a system called Product Tier to put manufacturers into three groups: Tier 1 (bankable producers with automated manufacturing processes and verified performance history), Tier 2 (established manufacturers with partial automation), or Tier 3 (smaller manufacturers or resellers) (BloombergNEF, 2025). Supplier Relationship, on the other hand, looks at how strong the relationship is and how well people work together to fix things.

In line with the definition of "Customer Service," the sub criteria "After-Sales Service" were deliberately placed under "Risk Management" rather than "Customer Service." There is a definite reason for this classification. Initially, within the solar module industry, after sales concerns primarily manifest as risk events, such as module defects, claims of performance degradation, and warranty disputes that constitute contingency situations rather than standard service operations (Shafiee & Chukova, 2013). Second, from the EPC company's perspective, the supplier's ability to address post-delivery issues directly influences project risk exposure. This differentiation aligns with the literature on supply chain risk management, in which post sales issue resolution is regarded as a risk mitigation strategy rather than a conventional service provision (Gatzert & Kosub, 2016).

Based on these operationalized criteria and sub-criteria, the decision hierarchy needs to be structured. This study applied AHP, integrating both national and imported solar modules into the analysis along with the relevant criteria and sub criteria. To make it easier to understand the problems, these will be put in a decision hierarchy (Tavana et al., 2023). The order of importance for making decisions is as follows: Level 0 is about what the study wants to learn, Level 1 is about the rules that will be used to reach those goals, and Level 2 is about the choices that have been made in the past for solar modules. Figure 2 correctly shows the decision hierarchy, listing the criteria and sub-criteria needed to select solar modules, as explained in detail in Table 3.

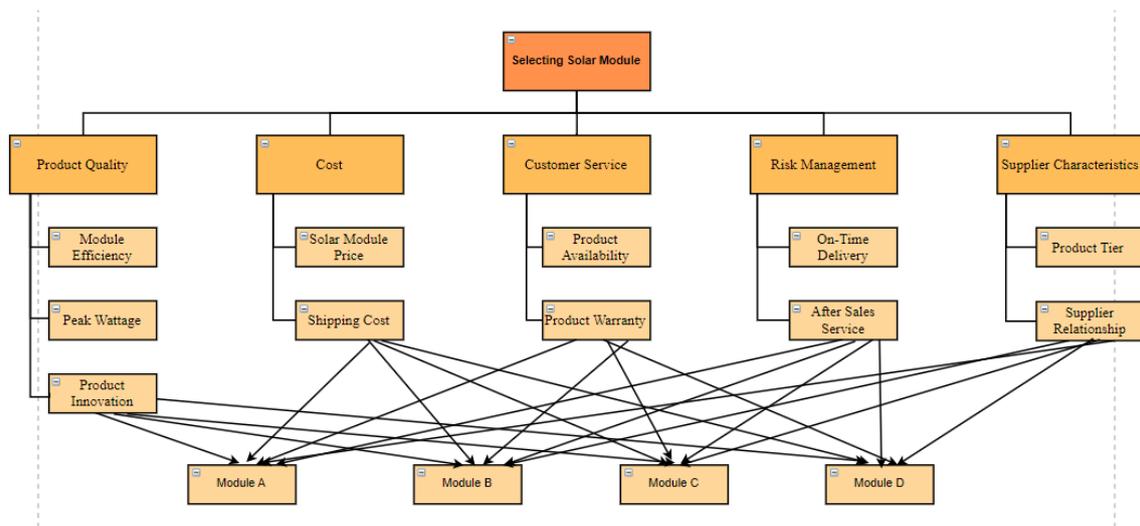


Figure 2. Decision Hierarchy

Source: Author, 2025

Table 4 shows the main parts of the solar panels that were studied. As per Presidential Regulation, 25% of the items in Module A must be produced in Indonesia. Modules B, C, and D, on the other hand, only have things that were made in other (Presidential Regulation of the Republic of Indonesia Number 46 of 2025 Concerning the Second Amendment to Presidential Regulation Number 16 of 2018 Concerning Government Procurement of Goods/Services, 2025). Brand names are kept secret to keep the study honest and stop bias from businesses.

Table 4. Attributes of the Solar Modules

Parameter	Module A (National)	Module B (Imported)	Module C (Imported)	Module D (Imported)
Peak Wattage (Wp)	400-450	500-550	520-570	500-540
Efficiency (%)	18.0-19.5	20.5-21.5	21.0-22.0	20.0-21.0
Warranty (Years)	10-12	12-15	15-25	12-15
Bloomberg Tier	Tier 2-3	Tier 1	Tier 1	Tier 1
Price (USD/ Wp)	0.20-0.25	0.18-0.22	0.19-0.23	0.18-0.22

Source: Market survey and EPC expert validation, 2025

Upon establishing the technical and commercial attributes of the assessed modules (Table 4), this study applies the AHP method to determine the weighted prioritisation of the selection criteria. To understand the weighted priorities in the Indonesian solar sector, one needs to understand the most influential factors in the supplier selection. Weights for the criteria and sub-criteria were derived from the second questionnaire, and the Expert Choice program was utilised to analyse and provide the final assessments. This popular decision-aiding method provides more detailed analysis of individual experts, greater efficiency in evaluating the consistency ratio of individual respondents, and reliable aggregation of expert opinions without losing significant data (Ishizaka & Mu, 2023). Weighted values were used to combine the opinions of experts from different EPC companies in order to get a sense of what a lot of people in the industry thought. This got rid of any bias that might have come from one person. Adding the CR to results with judgmental errors greater than 0.10 makes the prioritization more valuable and trustworthy (Tavana et al., 2023). All of the respondents' assessments in this study were consistent enough (CR < 0.10) to show that the experts'

assessments were logically sound and to build trust in the results. From the perspective of an EPC, the importance of each factor in the solar module supplier selection process is illustrated in Figures 3 and 4.

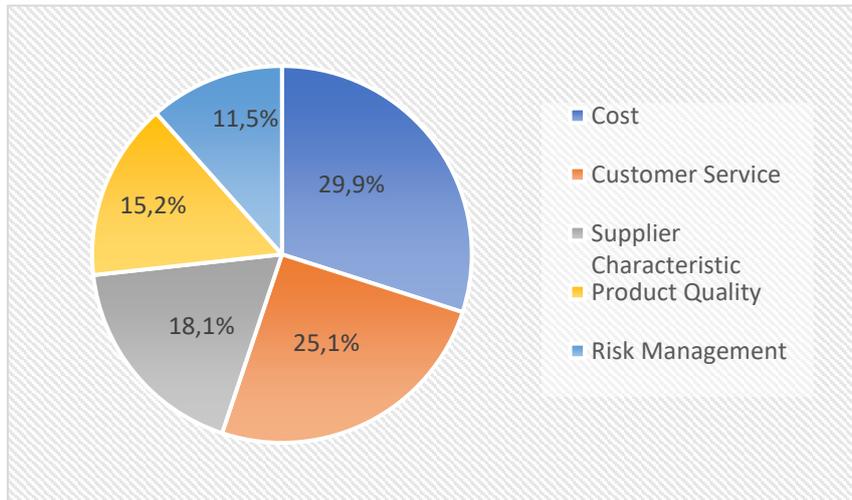


Figure 3. Criteria Weighting

Source: Author, 2025

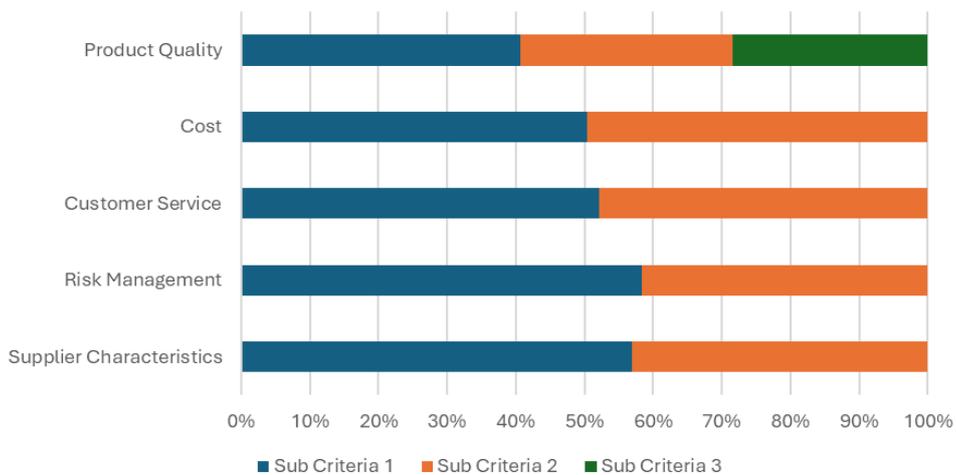


Figure 4. Sub-Criteria Weighting

Source: Author, 2025

Focusing on EPC procurement processes and the accompanying market conditions and economic factors, Figure 3 illustrates that cost is the primary and most weighted factor, followed by supplier, product quality, customer service, and risk. Price, shipping, and availability of the solar modules are the three most critical factors. In comparison, according to Figure 4, product innovation, peak wattage, and post sales service are the least priorities. At the same time, within each of these primary factors, there are sub criteria that EPCs must consider holistically to derive a performance metric spanning all evaluative dimensions. Overall prioritisation of any given criterion or sub criterion is insufficient to make effective sourcing decisions. In this analysis, the AHP method provides for a synthesis to offset this gap. Focused on imported versus locally manufactured modules, the weighted performance

priorities across all evaluative metrics allow for an unambiguous ranking of the different module options. This composite score reflects and facilitates the prioritisation of imported and domestic options. The combined findings are illustrated in Table 5, which, based on the collective expert opinion of Indonesian EPC specialists, provides a final module competitiveness rating.

Table 5. Overall Alternative Weighting

Module	Weight	Priority	Origin
Module A	0.129	IV	National
Module B	0.293	II	Imported
Module C	0.294	I	Imported
Module D	0.284	III	Imported

Source: Data processed, 2025

The table confirmed that Module A scored just 0.129 - less than half the weight of any imported alternative and placing it firmly in 4th the findings in Table 5 give a rather bleak outlook on the competitive status of national solar modules. The gap of 0.165 between the national module and the top imported module, Module C (0.294), is not just a statistical anomaly; it is an enormous gap (128%) that hinders Indonesia's aspirations for energy autonomy and DCL (Domestic Component Level) targets. Therefore, the conundrum for manufacturers, governments, and industry stakeholders is not whether a competitive gap exists; rather, it is about where this gap exists and which performance measures can be enhanced. You can use entity-weighted scores to do a gap identification study that turns metrics into useful information. Table 6 shows the differences in performance and lists the areas of competitive advantage that can be used to boost the use of national modules in the residential market. It also lists the areas of competitive disadvantage that need to be addressed right away.

Table 6. Gap Identification of National and Imported Solar Modules for Each Criterion and Sub-Criteria

Criteria	Module		Sub Criteria	Module	
	National	Imported		National	Imported
Product Quality	10%	34.6%	Module Efficiency	11.4%	34.6%
			Peak Wattage	8.5%	35.7%
			Product Innovation	9.8%	40.5%
Cost	14.2%	31.4%	Solar Module Price	10.6%	33.8%
			Shipping Cost	17.8%	31.5%
Customer Service	9.5%	32.5%	Product Availability	10.1%	30.6%
			Product Warranty	8.8%	36.4%
Risk Management	20.9%	28.7%	On-Time Delivery	28.8%	21.5%
			After Sales Service	9.8%	36.6%
			Tier Product	7.5%	33.5%
Supplier Characteristics	13%	34.7%	Supplier Relationship	20.2%	36.2%

Source: Author, 2026

Indonesia faces a significant challenge in acquiring solar energy, as evidenced by the comprehensive gap analysis in Table 6. Regarding Table 5, local items receive 12.9% of the procurement preference score for EPC companies that do not score highly on most evaluation criteria, despite the government DCL requiring solar modules to contain 25% local content.

From a quantitative perspective, based on four of the five primary criteria, national modules do not meet the standards of imported modules. Product Quality, Customer Service, Supplier Characteristics, and Cost each have a grade gap of 24.6, 24.0, 21.7, and 17.2 percentage points, respectively. Product Innovation has an even higher shortfall of 30.7 percentage points. The following gaps also stem from technology and service deficiencies: Peak Wattage (27.2), Product Warranty (27.6), and After Sales Service (26.8). These gaps also point to structural issues within domestic manufacturing that, within the defined constraints of policy mandates and price subsidies, may be addressed through coordinated development of R&D investment, quality infrastructure, and labour skill enhancement.

Module A's overall weight in Risk Management was affected by After Sales Services' relatively poor performance (9.8% vs. 36.6% for imported modules). The Expert Choice program shows how various modules integrate. In Product Quality (0.346) and Risk Management (0.287), Module B performs the best, while in Customer Service (0.325) and Supplier Characteristics (0.347), Module C performs the best. Module D has the highest cost (0.314). Of all the modules, Module C is the best, with a composite weight of 0.294, just ahead of Module B (0.293) and Module D (0.284). Module A lags behind at 0.129. Module C is superior until the weight is 34%, after which Module D takes the lead.

Sensitivity gap results of Software Expert Choice indicate that if Customer Service's weight drops below 19.3% (from second to third in importance), Module B would move ahead of Module C. Module B would perform better if the weight of Supplier Characteristics were lowered to 17.6% or less. Increasing Product Quality's weight to 17% or more is beneficial for Module B, but lowering it has a minimal effect. Lastly, if the weight of Risk Management is increased to 13.8% (in fourth place), Module B would be the most preferred. These sensitivity thresholds suggest that Module C has a narrow advantage with the current weighting systems. The competition with imported modules (B, C, D) is dynamic and context sensitive, whereas the competition with Module A is persistent, and the gap is large across priority-set configurations.

To improve the DCL, policymakers should strengthen local content rules to be more supportive and reduce the performance gaps. This discussion goes through each criterion in turn, highlights the main issues, benchmarks them against global best practices, and articulates associated policy and operational recommendations.

The primary reason Module A performs poorly in the Cost criterion, which carries the most weight in procurement decisions, is that its solar module price is not competitive with that of imports. The sensitivity analysis shows that a 21% price reduction for Module A will make it significantly more cost competitive and change purchasing dynamics. Most significant is that Module A's Watt Peak (Wp) capacity range is 400-450 Wp (Table 4), which is narrower than those of its competitors, leading to a cost-per-watt that is, on average, higher than that of competitor modules (500-570 Wp). This is, however, exacerbated by the disparity in how governments support their businesses in each target market. With extensive state support, including manufacturing incentives, soft credit financing, and export support, international suppliers of solar modules can sell their products at significantly lower prices. While Chinese competencies and Tier 1 technologies enable them to produce at the lowest cost in the market, their competitors are, in most instances, forced to adopt a more costly alternative (International Solar Energy Society (ISES), 2024).

Using new cell technologies to boost the peak power output of modules could boost efficiency from 18.0% to 19.5% to 21-22% (Green et al., 2023). To pay for growth, it's important to have soft loan programs, production grants, or tax breaks that make foreign

modules cheaper until domestic production is big enough. One example of an incentive is tax breaks for manufacturing equipment. In an efficient cost-competitiveness model, price, quality, and bankability are all connected in this way.

Constraints on production limit the ability to obtain sufficient quantities more than 300 kilotons of silica sand deposits available in Indonesia (Center for Mineral, Coal, and Geothermal Resources, 2021). In the next decade, global demand for EPC services is expected to increase significantly. For Indonesian producers, this supply gap presents opportunities to gain market share (Allied Market Research, 2025). Utilizing automation is expected to reduce the potential for human error and decrease labour costs by 45-60%, while increasing production levels by 300% (Ou et al., 2024). In Indonesia's residential market, competition will require domestic producers to implement modern manufacturing techniques and supply chain practices to meet the demand.

The global solar EPC market is envisaged to reach USD 1.2 trillion by 2034 (Allied Market Research, 2025), offering lucrative prospects for Indonesian manufacturers if they can remain competitive on pricing. Indonesia's manufacturers and local EPC firms must collaborate to secure additional market share and elevate the DCL to over 25% in the region. Given the government's emphasis on domestic manufacturing (Presidential Regulation of the Republic of Indonesia Number 46 of 2025 Concerning the Second Amendment to Presidential Regulation Number 16 of 2018 Concerning Government Procurement of Goods/Services, 2025), such collaboration will enable manufacturers and EPC firms to sell more solar modules in Indonesia, thus enhancing the country's competitiveness in the regional renewable energy market.

Indonesian solar manufacturers must advance their technology to compete with imported tier-1 modules in the residential market. Module efficiency is a critical factor in determining the level of technological advancement (Tyagi et al., 2013). For Indonesian businesses to achieve this, a significant emphasis on research and development is crucial, especially to reduce costs as research increases (Emblemsvåg, 2025). In this regard, Indonesian manufacturers need to collaborate with foreign counterparts to bridge this technological divide.

Buying national products has the advantage of being less of a concern for delivery times, as these products are made in Indonesia. Given this factor, solar module manufacturers in Indonesia need to enhance their after-sales service. Areas of after-sales service that need improving are technical support, customer satisfaction, customer service training, and repair job quality. Residential producers in Indonesia need to build lasting relationships with their customers to gain enduring support for their products. Fiscal incentives heavily influence the viability of solar PV projects in Indonesia, underscoring the need for in-depth policy impact evaluation to manage risks in these projects (Halimatussadiyah et al., 2023).

These changes will likely make Indonesian EPC companies more willing to sell national solar modules for homes, thereby helping the government achieve its renewable energy objectives. Indonesia's residential business is growing because of better service, working with EPC providers to automate and work together, and international cooperation on technology. These changes help Indonesian producers compete better with foreign goods, raise the domestic component level of products to over 25% DCL, make the country more energy self-sufficient, and help the country switch to renewable energy while using its silica sand reserves.

CONCLUSIONS

This study fills a major gap in our understanding of how national and imported solar modules compete in Indonesia's residential market by examining the issue from an EPC centric perspective. The research employs the Analytic Hierarchy Process (AHP) methodology, engaging 10 experts from 7 prominent EPC companies, to systematically quantify procurement decision criteria and pinpoint specific performance deficiencies that impact the competitiveness of national modules. The results show that cost is the most important factor (with the most weight), followed by supplier characteristics, product quality, customer service, and risk management. In terms of sub criteria, the three most important factors in procurement decisions are the price of solar modules, shipping costs, and product availability. The competitive gap analysis shows that Module A (national) only gets 12.9% of the procurement preference weight. In comparison, imported modules B, C, and D achieve between 0.284 and 0.294, representing a 128% performance deficit compared to the top-ranked module. National modules do poorly across four of the five main criteria. The biggest problems are with Product Quality (24.6 percentage points), Customer Service (24.0 percentage points), Supplier Characteristics (21.7 percentage points), and Cost (17.2 percentage points). Product Innovation has the biggest difference between sub criteria (30.7 percentage points), followed by Peak Wattage (27.2 points), Product Warranty (27.6 points), and After Sales Service (26.8 points). These gaps in technology and services show that domestic manufacturing is not up to par, and they cannot be fixed just by lowering prices or making rules. The analysis also finds a strategic competitive advantage: national modules are much better at On Time Delivery (28.8% vs. 21.5%), indicating that being close to where products are made gives EPC companies real operational benefits. This finding indicates that strategic positioning focused on supply chain resilience and delivery certainty may mitigate technical performance deficiencies, especially in residential projects where installation schedules are paramount.

The study proposes a comprehensive improvement framework comprising five strategic areas based on these findings. To stay competitive on price, suggestions include using advanced cell technologies to increase the Watt Peak output of modules, switching to manufacturing models that focus on assembly to cut capital costs, and using targeted policy interventions like soft loan programs and production subsidies that are set to make up for the cost difference with imported modules. To improve product quality, it is important to invest more in research and development, make it easier for companies to share technology, and establish quality certification programs that meet international Tier 1 standards. To improve customer service, manufacturing must be automated to produce more products and ensure they are always available. To improve supplier characteristics, EPC companies, manufacturers, and developers need to work together within ecosystems that enhance efficiency and build market trust. Finally, to improve risk management, there needs to be a professional after sales service system and clear channels for customers to communicate. The main problem with this study is that it examines only seven EPC companies in the Java, Bali, and Kalimantan areas that are part of the Solar Power Initiative Movement Program. Even though these companies are major players in the industry and do many residential solar installations, the results can't be used to make generalisations about all Indonesian EPC companies or about the commercial and industrial market segments, which may have different procurement priorities. The study also examines competitiveness at a single point in time (2025–2026), but solar technology and market dynamics change quickly, potentially altering the weights of the criteria and the

performance gaps over time. Subsequent research should broaden the sample to include EPC companies from all Indonesian regions and market segments to improve generalizability. Longitudinal studies monitoring the progression of competitiveness as national manufacturers adopt enhancement strategies would yield significant insights into the efficacy of interventions. Additionally, examining the perspectives of end-users (residential consumers) alongside those of EPCs may uncover additional determinants of adoption decisions. From a policy standpoint, forthcoming research should quantitatively assess the effects of specific interventions, including R&D subsidy levels, reductions in soft loan interest rates, and demand aggregation mechanisms, on bridging identified performance gaps would facilitate evidence-based policy formulation that redefines Domestic Component Level (DCL) compliance from a regulatory requirement into a substantive competitive advantage that bolsters Indonesia's energy independence goals.

REFERENCES

- Allied Market Research. (2025). *Solar EPC market - Global opportunity analysis and industry forecast, 2025-2034*. <https://www.alliedmarketresearch.com/solar-epc-market-A325109>
- Arsawan, I. W. E. (2023). Expanding Supply Chain Performance in Logistic and Forwarder Companies: How Collaboration Enhance Capabilities and Innovation Performance. *Matrik: Jurnal Manajemen, Strategi Bisnis Dan Kewirausahaan*, 17(1), 61. <https://doi.org/10.24843/matrik:jmbk.2023.v17.i01.p05>
- Beheshtinia, M. A., Yaghobian, S. N., Fathi, M., Ghobakhloo, M., & Foroughi, B. (2025). Overcoming barriers to renewable energy adoption: A decision-making framework for strategy evaluation and implementation prioritization. *Cleaner Environmental Systems*, 18, 100314. <https://doi.org/https://doi.org/10.1016/j.cesys.2025.100314>
- BloombergNEF. (2025). *Tier 1 Solar Module Maker Methodology*. Bloomberg Finance L.P. <https://about.bnef.com/>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/1744987120927206>
- Center for Mineral, Coal, and Geothermal Resources, G. A. (2021). *Neraca Sumber Daya dan Cadangan Mineral, Batubara, dan Panas Bumi Indonesia Tahun 2021*.
- Central Bureau of Statistics of Indonesia. (2024). *Energy Balances of Indonesia 2019-2023*. BPS-Statistic Indonesia. <https://www.bps.go.id/en/publication/2024/12/20/8e5fa42fa12d283e30d41918/energy-balances-of-indonesia-2019-2023.html>
- Darko, A., Chan, A. P. C., Ameyaw, E. E., Owusu, E. K., Pärn, E., & Edwards, D. J. (2019). Review of application of analytic hierarchy process (AHP) in construction. *International Journal of Construction Management*, 19(5), 436–452. <https://doi.org/10.1080/15623599.2018.1452098>
- Dehghanimadvar, M., Egan, R., & Chang, N. L. (2022). Economic assessment of local solar module assembly in a global market. *Cell Reports Physical Science*, 3(2), 100747. <https://doi.org/https://doi.org/10.1016/j.xcrp.2022.100747>
- Demir, A., Dinçer, A. E., & Yılmaz, K. (2024). A Novel Procedure for the AHP Method for the Site Selection of Solar PV Farms. *International Journal of Energy Research*, 2024(1), 5535398. <https://doi.org/https://doi.org/10.1155/2024/5535398>
- Dhumras, H., & Bajaj, R. K. (2024). On potential strategic framework for green supply chain

- management in the energy sector using q-rung picture fuzzy AHP \& WASPAS decision-making model. *Expert Syst. Appl.*, 237(PB). <https://doi.org/10.1016/j.eswa.2023.121550>
- Emblemsvåg, J. (2025). Rethinking the “ Levelized Cost of Energy ”: A critical review and evaluation of the concept. *Energy Research & Social Science*, 119(January). <https://doi.org/https://doi.org/10.1016/j.erss.2024.103897>
- Etikan, I., Musa, S. A., & Alkassim, R. S. (2016). Comparison of Convenience Sampling and Purposive Sampling. *American Journal of Theoretical and Applied Statistic*, 5(1), 1–4. <https://doi.org/10.11648/j.ajtas.20160501.11>
- Fàbregues, S., Younas, A., Escalante-Barrios, E. L., Molina-Azorin, J. F., & Vázquez-Miraz, P. (2024). Toward a Framework for Appraising the Quality of Integration in Mixed Methods Research. *Journal of Mixed Methods Research*, 18(3), 270–280. <https://doi.org/10.1177/15586898241257555>
- Gatzert, N., & Kosub, T. (2016). Risks and risk management of renewable energy projects: The case of onshore and offshore wind parks. *Renewable and Sustainable Energy Reviews*, 60, 982–998. <https://doi.org/10.1016/j.rser.2016.01.103>
- Green, M. A., Dunlop, E. D., Siefert, G., Yoshita, M., Kopidakis, N., Bothe, K., & Hao, X. (2023). Solar cell efficiency tables (Version 61). *Progress in Photovoltaics: Research and Applications*, 31(1), 3–16. <https://doi.org/https://doi.org/10.1002/pip.3646>
- Halimatussadiyah, A., Kurniawan, R., Mita, A. F., Maulia, R. F., Siregar, A. A., Al, W., Anky, K., & Hartono, D. (2023). The Impact of Fiscal Incentives on the Feasibility of Solar Photovoltaic and Wind Electricity Generation Projects : The Case of Indonesia. *Journal of Sustainable Development of Energy, Water and Environment System*, 11(1), 1–16. <https://doi.org/http://dx.doi.org/10.13044/j.sdewes.d10.0425>
- Institute for Essential Services Reform. (2019). Levelized Cost of Electricity in Indonesia: Understanding the Levelized Cost of Electricity Generation. In *Institute for Essential Services Reform*. <https://doi.org/10.4324/9781003262435-8>
- Institute for Essential Services Reform. (2024). *Indonesia Solar Energy Outlook 2025*. <https://iesr.or.id/pustaka/indonesia-solar-energy-outlook-2025/>
- International Solar Energy Society (ISES). (2024, July). China’s solar dominance not an issue. *Pv Magazine*. <https://www.pv-magazine.com/2024/07/24/chinas-solar-dominance-not-an-issue/>
- Ishizaka, A., & Mu, E. (2023). What is so special about the analytic hierarchy and network process? *Annals of Operations Research*, 326(2), 625–634. <https://doi.org/10.1007/s10479-023-05412-4>
- Jowett, P. (2025, March). China’s power reform could boost solar module demand, prices, says S&P Global. *Pv Magazine*. <https://www.pv-magazine.com/2025/03/11/chinas-power-reform-could-boost-solar-module-demand-prices-says-sp-global/>
- Khanna, T. M., Baiocchi, G., Callaghan, M., Creutzig, F., Guías, H., Haddaway, N. R., Hirth, L., Javaid, A., Koch, N., Laukemper, S., Löschel, A., Zamora Dominguez, M. del M., & Minx, J. C. (2021). A multi-country meta-analysis on the role of behavioural change in reducing energy consumption and CO2 emissions in residential buildings. *Nature Energy*, 6(9), 925–932. <https://doi.org/10.1038/s41560-021-00866-x>
- Kotler, P., & Keller, K. L. (2016). *Marketing Management Global Edition*. <https://doi.org/10.1080/08911760903022556>
- Kuo, T., & Chen, M.-H. (2023). On using pairwise comparison in the analytic hierarchy process: Validity is goal while consistency is means. *Information Sciences*, 648, 119630. <https://doi.org/https://doi.org/10.1016/j.ins.2023.119630>

- Madzík, P., & Falát, L. (2022). State-of-the-art on analytic hierarchy process in the last 40 years: Literature review based on Latent Dirichlet Allocation topic modelling. *PloS One*, *17*(5), e0268777. <https://doi.org/10.1371/journal.pone.0268777>
- Ministry of Energy and Minerals Indonesia. (2024). *Handbook of Energy and Economic Statistic of Indonesia*. Ministry of Energy and Minerals Indonesia. <https://www.esdm.go.id/assets/media/content/content-handbook-of-energy-and-economic-statistics-of-indonesia-2024.pdf>
- National Renewable Energy Laboratory - United States Agency International Development. (2020). *EXPLORING RENEWABLE ENERGY OPPORTUNITIES IN SELECT SOUTHEAST ASIAN COUNTRIES A Geospatial Analysis of the Levelized Cost of Energy of Utility-Scale Wind and Solar Photovoltaics* (Issue June). <http://www.nrel.gov/publications>
- Ou, Y., Hsiao, C. Y.-L., & Chui, C. M. (2024). How does the supply chain market respond to policy shocks? Evidence from solar photovoltaic sectors in China. *Renewable Energy*, *232*, 121129. <https://doi.org/https://doi.org/10.1016/j.renene.2024.121129>
- Presidential Regulation of the Republic of Indonesia Number 46 of 2025 concerning the Second Amendment to Presidential Regulation Number 16 of 2018 concerning Government Procurement of Goods/Services, April (2025). <https://peraturan.bpk.go.id/Details/318647/perpres-no-46-tahun-2025>
- Saaty, T. (2008). Decision Making with the Analytic Hierarchy Process. *Int. J. Services Sciences Int. J. Services Sciences*, *1*, 83–98. <https://doi.org/10.1504/IJSSCI.2008.017590>
- Saaty, T. L. (2001). Fundamentals of the Analytic Hierarchy Process. In D. L. Schmoldt, J. Kangas, G. A. Mendoza, & M. Pesonen (Eds.), *The Analytic Hierarchy Process in Natural Resource and Environmental Decision Making* (pp. 15–35). Springer Netherlands. https://doi.org/10.1007/978-94-015-9799-9_2
- Saez, R., Boer, D., Shobo, A. B., & Vall, M. (2023). Techno-economic analysis of residential rooftop photovoltaics in Spain. *Renewable and Sustainable Energy Reviews*, *188*(October). <https://doi.org/10.1016/j.rser.2023.113788>
- Salomon, V. A., & Gomes, L. F. (2024). Consistency Improvement in the Analytic Hierarchy Process. In *Mathematics* (Vol. 12, Issue 6, p. 828). <https://doi.org/10.3390/math12060828>
- Secretariat General of the National Energy Council. (2023). *Laporan Analisis Neraca Energi*. <https://den.go.id/publikasi/neraca-energi>
- Shafiee, M., & Chukova, S. (2013). Maintenance models in warranty: A literature review. *European Journal of Operational Research*, *229*(3), 561–572. <https://doi.org/https://doi.org/10.1016/j.ejor.2013.01.017>
- Tavana, M., Soltanifar, M., & Santos-Arteaga, F. J. (2023). Analytical Hierarchy Process: Revolution and Evolution. *Annals of Operations Research*, *326*(2), 879–907. <https://doi.org/10.1007/s10479-021-04432-2>
- The Directorate General of New Renewable Energy and Energy Conservation. (2024). *Performance Report*. <https://www.esdm.go.id/assets/media/content/content-laporan-kinerja-ditjen-ebtke-tahun-2024.pdf>
- Tyagi, V., Rahim, N., Abd Rahim, N., & Selvaraj, J. (2013). Progress in Solar PV Technology: Research and Achievement. *Renewable and Sustainable Energy Reviews*, *20*, 443–461. <https://doi.org/10.1016/j.rser.2012.09.028>
- Xiong, Y., & Yang, X. (2016). Government subsidies for the Chinese photovoltaic industry. *Energy Policy*, *99*, 111–119. <https://doi.org/https://doi.org/10.1016/j.enpol.2016.09.013>



P-ISSN: 1978-2853
E-ISSN: 2302-8890

MATRIK: JURNAL MANAJEMEN, STRATEGI BISNIS, DAN KEWIRAUSAHAAN

Homepage: <https://ejournal1.unud.ac.id/index.php/jmbk>

Vol. 19 No. 1, 2026 (February), 111-128



AMBIDEXTERITY AND PERCEIVED ORGANIZATIONAL SUPPORT PREDICT EMPLOYEE PERFORMANCE: ROLES OF DARK TRIAD AND JOB SATISFACTION



SINTA 2

Raden Teja Yokanan¹⁾, Mardin Nazara²⁾

^{1,2} Universitas Kristen Immanuel, Yogyakarta, Indonesia
Email: teja.yokanan@ukrimuniversity.ac.id

DOI : <https://doi.org/10.2484/MATRIK:JMBK.2026.v20.p07>

ABSTRACT

In today's competitive business environment, organizations must balance exploitation and exploration to sustain employee performance. This study examines the effects of ambidexterity, perceived organizational support (POS), job satisfaction, and the Employee Dark Triad on employee performance. Using a quantitative approach, data were collected from 150 employees of PT Nutrisi Keluarga, Indonesia, and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM). The results indicate that ambidexterity and job satisfaction positively affect employee performance, while POS significantly enhances job satisfaction, which mediates its relationship with performance. Furthermore, the Employee Dark Triad shows a positive direct effect on performance but negatively moderates the relationship between ambidexterity and performance. This study contributes to the human resource management literature by developing a moderated-mediation model integrating organizational capabilities, support mechanisms, and personality traits. Practically, organizations should foster ambidexterity, strengthen organizational support, promote job satisfaction, and manage dark personality tendencies to optimize employee performance.

Keywords: ambidexterity; perceived organizational support; job satisfaction; dark triad.

INTRODUCTION

In today's increasingly complex and competitive business environment, organizations must not only survive but also grow by simultaneously exploring new opportunities and exploiting existing resources. This dual capability, known as organizational ambidexterity, allows organizations to innovate while maintaining efficiency and achieving short-term performance targets (Huong Tran et al., 2025). Ambidexterity is not only critical at the organizational level but also at the individual level, where employees' ability to balance exploratory and exploitative learning positively influences their work performance (Clauss et al., 2021).

Despite its benefits, the effective implementation of ambidexterity can be threatened by the presence of employees exhibiting the Dark Triad personality traits, Machiavellianism, narcissism, and psychopathy. These traits are characterized by manipulateness, self-interest, and a lack of empathy, which can undermine cooperation, knowledge sharing, and strategic alignment (Ceptureanu et al., 2025). In practice, employees with high Dark Triad tendencies may resist collaborative learning, prioritize personal gains over organizational

goals, and obstruct ambidextrous behaviors, thus endangering both innovation and efficiency (Noviza et al., 2025). Empirical evidence on the interplay between ambidexterity and the Dark Triad, particularly in Indonesia, remains limited, leaving a critical gap in understanding how personality traits influence the effectiveness of ambidextrous strategies at the individual level.

Another crucial factor influencing employee performance is Perceived Organizational Support (POS), which reflects the degree to which employees believe that the organization values their contributions and cares about their well-being. POS has been shown to enhance job satisfaction, motivation, and work performance (Ijigu et al., 2022). In the context of ambidexterity, POS may act as a supportive mechanism that encourages employees to engage in both exploratory and exploitative learning, buffering potential negative effects of dark personality traits. Furthermore, job satisfaction is considered a key affective mediator linking organizational support and performance outcomes, yet its role in the ambidexterity–performance relationship has not been fully explored (Elif & Ashi, 2024).

The conceptual framework of this study integrates ambidexterity, POS, job satisfaction, and the Dark Triad to address a central research problem: how can individual ambidexterity enhance employee performance in the presence of potentially disruptive personality traits, and what role do organizational support and job satisfaction play in this process? This framework is theoretically grounded in the Job Demands-Resources (JD-R) Theory, which posits that personal and organizational resources can foster engagement and performance, while individual traits may either facilitate or hinder this process (Dwiputri & Surya Wanasida, 2024). Specifically, ambidexterity is viewed as a personal resource, POS as an organizational resource, and the Dark Triad as a potential personal barrier. Job satisfaction serves as an affective mechanism mediating the influence of these resources on performance outcomes (Kamal & Kahar, 2025).

By combining these variables, this study offers both theoretical and practical contributions. Theoretically, it extends the literature on ambidexterity by examining its individual-level implications in the context of dark personality traits and organizational support. Practically, it provides insights for human resource management in designing strategies that enhance performance while mitigating the risks associated with the Dark Triad. This integrated model is particularly relevant for Indonesian organizations, where empirical studies on these dynamics are scarce, and can inform interventions to promote balanced, high performing, and psychologically safe work environments. From this discussion, we hypothesize that:

H1: Ambidexterity has a positive effect on employee performance.

Ambidexterity at the individual level refers to employees' ability to simultaneously engage in both exploratory and exploitative activities in performing their work tasks. This capability enables employees to balance innovation and efficiency, allowing them to respond effectively to dynamic work environments while maintaining consistent performance. Prior studies have highlighted that individual-level ambidexterity is supported by several psychological and cognitive mechanisms, including psychological ownership, perceived organizational and job ownership, learning orientation, as well as social and cognitive factors. These mechanisms facilitate the effective transformation of ambidextrous behaviors into superior performance outcomes (Balzano et al., 2025). Furthermore, ambidexterity is conceptualized as a positive motivational resource that stimulates proactive work engagement and the application of active coping strategies when facing job demands. Such proactive and adaptive behaviors enhance employees' capacity to manage work challenges, which in turn leads to improved individual performance (Liao et al., 2025). Employees who

exhibit higher levels of ambidexterity tend to demonstrate greater flexibility, initiative, and problem-solving ability, enabling them to deliver more optimal work results. In addition, ambidextrous leadership plays a critical role in reinforcing the positive impact of ambidexterity on employee performance. This leadership style encourages autonomy, independent thinking, and self-directed behavior among employees, thereby fostering responsibility and initiative in task accomplishment. Moreover, ambidextrous leadership promotes collaboration through the development of a shared vision and the establishment of high-performance expectations, which create a supportive organizational climate conducive to performance enhancement (Azmy & Hartono, 2025).

H2: The employee dark triad has a significant effect on employee performance.

The Dark Triad personality traits, namely narcissism, Machiavellianism, and psychopathy, represent a set of socially aversive characteristics that pose substantial challenges within organizational contexts. These traits are commonly associated with a wide range of dysfunctional workplace outcomes, including counterproductive work behavior, unethical decision-making, and distorted interpersonal and team dynamics. Individuals who exhibit high levels of Dark Triad traits often prioritize self-interest, display manipulative tendencies, and demonstrate a lack of empathy, which may undermine cooperation and trust in the workplace (Upadhyay & Baber, 2023). Nevertheless, recent studies suggest that the influence of the Dark Triad is not exclusively detrimental. Under certain organizational conditions, specific elements of these traits may contribute positively to work outcomes. For instance, narcissistic tendencies may foster confidence and assertiveness, Machiavellianism may enhance strategic thinking, and psychopathy-related characteristics such as emotional detachment may support resilience in high-pressure environments. These potential advantages indicate that the Dark Triad can exhibit both dysfunctional and functional consequences, depending on contextual and situational factors (Upadhyay & Baber, 2023). Given the complex and dual nature of the Dark Triad traits, it is important to further examine their role in shaping employee attitudes and behaviors in organizational settings. Moreover, existing evidence suggests that individuals with Dark Triad traits do not uniformly exhibit dysfunctional workplace behaviors. Under certain organizational conditions, these traits may also facilitate adaptive outcomes, particularly in contexts that demand creativity, risk-taking, and strategic thinking. For instance, Machiavellianism has been associated with heightened strategic orientation, narcissism with elevated self-confidence and achievement motivation, and psychopathy-related traits with emotional resilience in high-pressure environments. Empirical studies further indicate a positive association between the Dark Triad and creativity, creative deviance, and innovative behavior, suggesting that these traits may enhance performance in highly dynamic and uncertain work contexts (Li & Chen, 2025).

H3: Perceived organizational support has a positive effect on job satisfaction.

Perceived organizational support (POS) reflects employees' perceptions of the extent to which their organization values their contributions and cares about their well-being. Previous studies indicate that POS plays a crucial role in fostering positive work-related attitudes, particularly job satisfaction and organizational commitment. When employees perceive strong organizational support, they are more likely to experience positive emotions, demonstrate higher dedication, and exhibit improved job performance, while simultaneously showing lower levels of turnover intention and absenteeism (Claudia, 2018); (Maan et al., 2020). More specifically, organizational support theory suggests that employees develop higher levels of job satisfaction when organizations fulfill their socio-emotional needs and provide appropriate recognition and rewards for work-related efforts. Such supportive

practices create a favorable work environment that encourages positive attitudes and behaviors among employees (Mascarenhas et al., 2022). Grounded in the principle of reciprocity, employees who feel supported by their organization tend to respond with stronger emotional attachment, increased job satisfaction, and enhanced organizational commitment, which collectively contribute to better individual and organizational outcomes. Empirical evidence further confirms the positive association between perceived organizational support and job satisfaction. Employees who receive higher levels of organizational support report significantly greater satisfaction with their jobs, as organizational care and appreciation strengthen their sense of value and belonging at work (Roji & Kurniawan, 2024); Siregar et al., 2024). Therefore, it can be argued that organizational support serves as a key antecedent of job satisfaction in the workplace.

H4: Job satisfaction has a positive effect on employee performance.

The relationship between job satisfaction and employee performance has attracted considerable scholarly attention, yet empirical findings remain mixed. While several studies have reported a significant positive association between job satisfaction and performance, others have found no direct effect. These inconsistent results highlight the complexity of the relationship and indicate the need for deeper investigation to better understand the underlying mechanisms and contextual factors that may shape this linkage (Suwandana, 2025). Despite these mixed findings, theoretical and empirical evidence suggests that job satisfaction plays a vital role in shaping employee attitudes and behaviors. Although dissatisfaction may not immediately lead employees to leave their jobs, it can negatively affect their psychological well-being, interpersonal relationships with colleagues, and the overall quality of their work output and service delivery. Consequently, employees who experience higher levels of job satisfaction tend to demonstrate more positive work behaviors and improved performance outcomes (Ningsih, n.d.). Furthermore, empirical studies have consistently demonstrated that job satisfaction significantly influences employee performance through various job-related dimensions, including the nature of the work itself, compensation, promotion opportunities, supervisory support, and relationships with co-workers (Oktavia, 2023). These factors contribute to employees' overall sense of fulfillment, which in turn enhances their motivation, engagement, and productivity. In addition, job satisfaction has been shown to exert both direct and indirect effects on performance, particularly when mediated by factors such as work stress. Employees who experience higher satisfaction levels are better able to manage job demands, resulting in superior performance outcomes (Yaso. I Made Suar & Studi Manajemen, 2023). Moreover, job satisfaction reflects an individual's emotional evaluation of their work experiences, generating positive feelings that foster intrinsic motivation and commitment. Such positive psychological states encourage employees to exert greater effort, display higher levels of responsibility, and achieve better performance results (Nabila & Budiono, 2025). Therefore, job satisfaction can be considered a critical antecedent of employee performance.

H5: Job satisfaction mediates the relationship between perceived organizational support and employee performance.

Perceived organizational support (POS) has been widely recognized as a crucial antecedent of employee attitudes and performance. However, recent studies suggest that the effect of POS on employee performance is often indirect, operating through important psychological and attitudinal mechanisms, particularly job satisfaction. Job satisfaction represents employees' positive emotional responses toward their work experiences, which can translate organizational support into enhanced motivation, commitment, and performance outcomes.

Empirical evidence demonstrates that job satisfaction fully mediates the relationship between perceived organizational support and job performance, indicating that employees' perceptions of organizational care and appreciation primarily influence performance by first shaping their level of satisfaction at work (Sharma & Biswakarma, 2020). In line with this, POS has been shown to exert a significant indirect effect on job performance through job satisfaction, highlighting the central role of satisfaction in linking supportive organizational practices to individual performance outcomes. Furthermore, studies conducted in diverse organizational contexts reinforce the mediating role of job satisfaction. Research in the financial services sector in China revealed that employees who perceive higher organizational support experience increased job satisfaction, which subsequently enhances their motivation, loyalty, and work effectiveness. This mediating mechanism underscores how supportive organizational environments foster positive emotional states that encourage superior performance. Similarly, evidence from the banking industry confirms that organizational support, manifested through rewards, career development opportunities, and managerial attention, strengthens employees' job satisfaction, which in turn positively affects their performance (Pamungkas & Tanuwijaya, 2025). Collectively, these findings suggest that job satisfaction functions as a key psychological pathway through which perceived organizational support influences employee performance. By fulfilling employees' socio-emotional needs and recognizing their contributions, organizations can enhance job satisfaction, thereby stimulating higher levels of motivation, commitment, and work effectiveness.

H6: The employee dark triad moderates the relationship between ambidexterity and employee performance.

Although prior studies have consistently demonstrated the positive role of employee ambidexterity in enhancing individual performance, empirical investigations that integrate personality traits, particularly the dark triad as a moderating variable remain limited. As organizations increasingly adopt ambidexterity as a strategic approach to improve performance and customer satisfaction, understanding its implications at the employee level has become increasingly important. Prior research provides strong empirical evidence that employee ambidexterity significantly contributes to improved individual performance outcomes by fostering flexibility, proactive engagement, and adaptive work behaviors (Liao et al., 2025). Nevertheless, the effectiveness of ambidextrous behaviors may vary substantially across individuals, depending on their personality characteristics. The Dark Triad, comprising narcissism, Machiavellianism, and psychopathy, represents a cluster of socially aversive personality traits associated with opportunism, manipulation, emotional detachment, and self-centeredness. These traits are likely to influence how employees balance exploration and exploitation activities in ambidextrous work settings. Employees with high levels of Dark Triad traits may utilize autonomy and flexibility primarily to pursue personal interests, potentially weakening the positive effect of ambidexterity on performance. In contrast, employees with lower levels of these traits are more inclined to channel ambidextrous behaviors toward collective and organizational goals, thereby strengthening performance outcomes. Taken together, these theoretical arguments and empirical findings imply that the Dark Triad functions as a critical boundary condition that shapes the strength of the relationship between employee ambidexterity and performance.

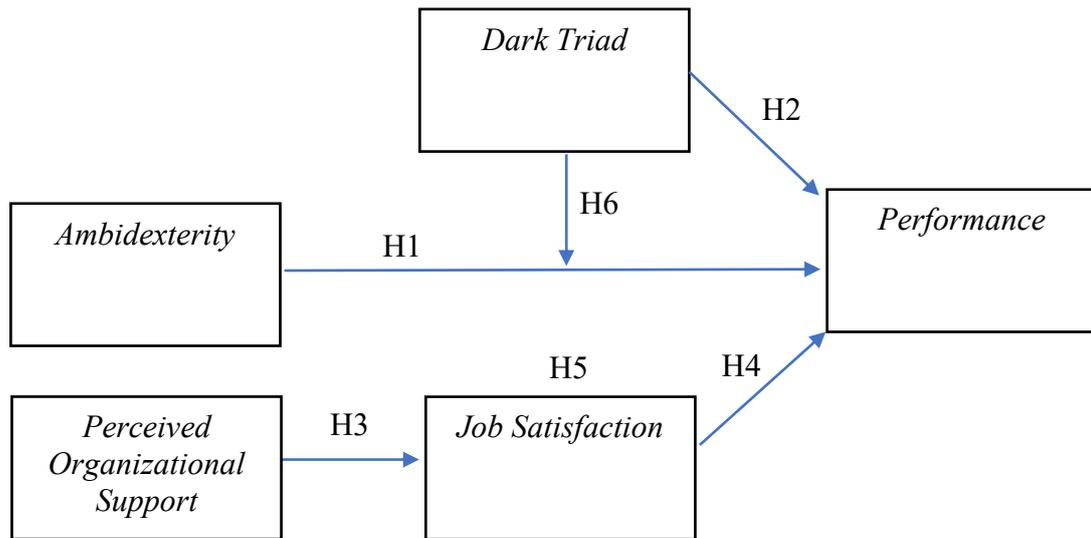


Figure 1. Research Framework

Source: Data processed, 2025

METHODS

This study employs a quantitative research approach, using both primary and secondary data that are measurable, systematic, empirical, and objective. The quantitative approach was chosen to test the hypotheses and examine the relationships between independent and dependent variables in a structured and replicable manner. Primary data were collected through a structured questionnaire administered to employees, while secondary data included organizational records on employee performance, internal HR reports, and prior studies used to develop and validate measurement instruments. This combination of primary and secondary data strengthens the reliability and contextual relevance of the study findings.

The study was conducted from September 2024 to July 2025 at PT Nutrisi Keluarga, a large-scale food and nutrition manufacturing company. The organization was selected because it operates in a highly competitive and innovation-driven environment where ambidexterity, organizational support, and personality traits are expected to significantly impact employee performance. Employees in the blending and packing departments, totaling 340 individuals, served as the population for the study. These departments were chosen because they involve both routine (exploitative) and problem-solving (exploratory) tasks, making them relevant for examining ambidexterity and the moderating role of the Dark Triad.

A sample of 150 employees was selected using a simple random sampling technique, ensuring that every individual in the population had an equal probability of being included. The sample size was justified based on established rules for PLS-SEM, which suggest that the minimum sample should be 10 times the largest number of structural paths directed at a single construct (Guenther et al., 2023). Additionally, the sample size satisfies recommendations from statistical power analysis, providing sufficient power (>0.80) to detect significant relationships among latent variables.

Data were collected using a structured questionnaire adapted from validated instruments in previous research. Ambidexterity items were adapted from Nasution et al.

(2023), Perceived Organizational Support (POS) items were adapted from Khusna et al. (2025), and job satisfaction items were based on Khair et al. (2024). The Dark Triad was measured using the Short Dark Triad (SD3) instrument developed by Denovan et al. (2024), which includes items for Machiavellianism, narcissism, and psychopathy. The self-report method is acknowledged to be prone to social desirability bias, especially for negative traits like the Dark Triad, which may result in underreporting. Respondents were provided with a detailed explanation of the study objectives, assurances of confidentiality, and instructions on completing the questionnaire between May 7 and May 19, 2025.

The questionnaire employed a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), chosen for its ability to generate quantifiable and comparable data. Before analysis, all collected data were verified for completeness and consistency.

Data analysis was conducted using SmartPLS 4.1, appropriate for examining relationships among latent constructs via the Partial Least Squares – Structural Equation Modeling (PLS-SEM) approach. Measurement model evaluation included validity and reliability testing. Construct validity was assessed through convergent validity (outer loadings >0.70 ; AVE ≥ 0.50) and discriminant validity using cross-loadings and the Heterotrait-Monotrait Ratio (HTMT <0.85). Reliability was assessed using composite reliability (>0.70) and Cronbach's alpha (≥ 0.70 , acceptable ≥ 0.60 for early-stage research).

The structural model was analyzed to examine the hypothesized causal relationships among variables. The R^2 value was interpreted strong (≥ 0.75), moderate (0.50–0.74), weak (0.25–0.49), and very weak (<0.25). Goodness-of-fit was assessed using the Standardized Root Mean Square Residual (SRMR <0.08) and Normed Fit Index (NFI >0.90). Significance of path coefficients was tested using bootstrapping, with p-values <0.05 and t-statistics >1.97 considered significant for a two-tailed test at a 5% significance level.

RESULT AND DISCUSSION

The respondent profile shows that the majority were male (69%) and aged between 30 and <40 years (57.3%). Most respondents had completed senior high school or vocational education (54.6%) and had less than five years of work experience (51.3%). Respondents were distributed across various departments, with the highest proportions in Packing Operators and Blending Operators (each 19.3%), followed by Quality Control (18.6%) and Staff (14.0%). This distribution reflects a diverse workforce across demographics and job functions, suggesting the data are sufficiently representative for analyzing the studied variables as detailed in Table 1.

The measurement model analysis (outer model) was conducted to ensure that the indicators used in this study could measure latent constructs validly and reliably. The outer model defines the relationship between latent constructs and their indicators, distinguishing between reflective and formative indicators (Pereira et al., 2024). This study employed reflective indicators, which assume that the indicators are influenced by the latent constructs. The selection of indicator types can be based on theory, previous empirical studies, or rational considerations.

Convergent validity was assessed using outer loadings (Table 2) and the Average Variance Extracted (AVE) through SmartPLS 4.1. Indicators with outer loadings greater than 0.70 are considered valid. Initial analysis indicated that some indicators did not meet the 0.70 threshold, leading to their removal. The final results show that all remaining indicators are valid (Table 2).

The Average Variance Extracted (AVE) for all constructs exceeded 0.50, confirming adequate convergent validity. Reliability was assessed using Composite Reliability and

Cronbach's Alpha. All constructs exceeded the threshold of 0.70, indicating good internal consistency. Goodness of Fit refers to the overall adequacy of the model in representing the observed data. A PLS model is considered to demonstrate acceptable model fit if the SRMR value is below 0.08 or 0.10. Furthermore, a Normed Fit Index (NFI) value closer to 1 indicates better model fit, with values above 0.90 considered excellent. According to Duryadi (2021), NFI values of 0.19, 0.33, and 0.67 represent weak, moderate, and strong categories, respectively. Based on the results, the SRMR value of 0.077 is below the threshold of 0.08, indicating strong model fit, while the NFI value of 0.785 exceeds 0.67, which falls into the strong category. Therefore, the proposed model satisfies the goodness-of-fit criteria.

Table 1. Respondent Demographic

Category	Description	Frequency	Percentage
Gender	Male	104	69%
	Female	46	31%
Age	20-<30 years	53	35.3%
	30-<40 years	86	57.3%
	40-<50 years	12	8.0%
	≥50 years	2	1.3%
Education	Senior High School / Vocational	82	54.6%
	Diploma	43	28.6%
	Bachelor's Degree (S1)	25	16.6%
Work Experience	<5 years	77	51.3%
	5-<10 years	54	36.0%
	10-<15 years	9	6.0%
	15-<20 years	11	7.3%
	20-<25 years	2	1.3%
Department	Packing Operator	29	19.3%
	Blending Operator	29	19.3%
	Quality Control (QC)	28	18.6%
	Staff	21	14.0%
	Forklift Operator	14	9.3%
	Material Handler	11	7.3%
	Process Leader	10	6.6%
	Facility & Services	6	4.0%
Maintenance Lead	2	1.3%	

Source: processed primary data (2025)

Table 2. Measurement Model Indices

Variable	Indicator	Loading	AVE	CR	Cronbach's Alpha
Ambidexterity	X1.3	0.790	0.683	0,915	0,884
	X1.5	0.824			
	X1.6	0.838			
	X1.7	0.829			
	X1.8	0.850			
Perceived Org. Support	X2.2	0.832	0.687	0,898	0,848
	X2.4	0.835			
	X2.7	0.802			
	X2.8	0.846			
Employee Dark Triad	M.1	0.844	0.686	0,897	0,855
	M.2	0.862			
	M.3	0.864			
	M.4	0.736			
Job Satisfaction	Z.1	0.757	0.614	0,927	0,910
	Z.2	0.766			
	Z.4	0.786			
	Z.5	0.760			
	Z.6	0.835			
	Z.7	0.832			
Performance	Z.8	0.784	0.731	0,931	0,908
	Z.9	0.743			
	Y.1	0.835			
	Y.2	0.887			
	Y.3	0.832			
	Y.4	0.876			
	Y.5	0.842			
SRMR	0.0777				
NFI	0.785				

Source: Data processed, 2025

Subsequently, discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). The results show that each indicator correlates most strongly with its intended construct and that all values remain below the strict HTMT threshold of 0.85.

Table 3. HTMT

Construct	AMD	EDT	JS	PE	POS
AMD	–				
EDT	0.249	–			
JS	0.735	0.247	–		
PE	0.835	0.308	0.819	–	
POS	0.779	0.337	0.833	0.842	–

Source: Data processed, 2025

The results of the hypothesis testing indicate that ambidexterity has a positive and significant effect on employee performance; therefore, H1 is supported. This finding suggests that employees' ability to simultaneously balance exploratory and exploitative activities can effectively enhance work effectiveness, quality, and productivity.

Conceptually, ambidexterity enables employees not only to maintain operational efficiency through the exploitation of routine work practices but also to foster innovation through the exploration of new ideas, technologies, and methods. The integration of these two activities strengthens individuals' adaptive capacity in responding to dynamic work demands, thereby leading to more optimal performance outcomes. This result is consistent with the findings of Clauss et al. (2021) and Balzano et al. (2024), who emphasize that individual-level ambidexterity represents a critical psychological resource that facilitates work engagement, continuous learning, and performance effectiveness. In the context of PT Nutrisi Keluarga, this finding indicates that employees in the blending and packing departments who are able to combine operational efficiency with creative problem-solving tend to demonstrate superior performance. Exploitative activities, such as improving production quality and complying with standard operating procedures (SOPs), when integrated with exploratory behaviors involving process innovation and technological adaptation, directly contribute to improvements in work quality, timeliness, and achievement of production targets. Therefore, this result further reinforces the argument that ambidexterity functions as a personal resource within the framework of the Job Demands–Resources (JD-R) Theory, enabling employees to remain productive amid complex and demanding work environments.

The results of the analysis indicate that the Dark Triad has a positive and significant effect on employee performance; therefore, H2 is supported. This finding suggests that personality traits associated with the Dark Triad—namely narcissism, Machiavellianism, and psychopathy—can contribute positively to individual performance outcomes within specific organizational contexts. This positive relationship implies that certain characteristics of the Dark Triad may function as performance-enhancing factors. Consistent with the findings of Upadhyay and Baber (2023) and Li and Chen (2025), narcissistic tendencies may foster self-confidence, assertiveness, and a strong desire for achievement, which can motivate individuals to perform at higher levels. Machiavellian traits may enhance strategic thinking, goal orientation, and adaptive decision-making, while selected psychopathy-related characteristics, such as emotional detachment and stress tolerance, may improve resilience and effectiveness in high-pressure work environments. In tasks requiring speed, precision, and mental endurance, these traits may facilitate more efficient and goal-directed performance. However, although the Dark Triad demonstrates a positive influence on performance, its underlying characteristics also carry potential risks. Excessive self-interest, manipulative behavior, and limited empathy may weaken interpersonal relationships, reduce collaboration, and negatively affect the social climate within organizations. Therefore, this finding highlights the context-dependent and dualistic nature of the Dark Triad, suggesting that its positive impact on performance can be optimized when supported by effective leadership, ethical standards, and appropriate control mechanisms. Under such conditions, the Dark Triad may serve not only as a driver of individual achievement but also as a strategic asset in competitive and dynamic work environments.

The results of the hypothesis testing indicate that perceived organizational support (POS) has a positive and significant effect on job satisfaction; therefore, H3 is supported. This finding reinforces organizational support theory, which posits that employees' perceptions of organizational care, recognition, and concern for their well-being directly

enhance their level of job satisfaction. When employees feel valued, treated fairly, and supported by both their supervisors and the organization, they are more likely to experience positive emotions toward their work. These positive emotional states foster a stronger sense of belonging, emotional commitment, and psychological attachment to the organization. This finding is consistent with prior studies by Claudia (2018), Mascarenhas et al. (2022), and Roji and Kurniawan (2024), which conclude that perceived organizational support is a primary determinant of job satisfaction. In the context of PT Nutrisi Keluarga, supervisory support, clarity of career development pathways, and favorable working conditions were found to significantly enhance employees' job satisfaction. Such conditions create a psychologically supportive work environment in which employees feel comfortable, appreciated, and motivated to contribute more effectively to organizational goals.

The results of the analysis indicate that job satisfaction has a positive and significant effect on employee performance; therefore, H4 is supported. This finding suggests that higher levels of job satisfaction experienced by employees lead to better performance outcomes. Job satisfaction reflects individuals' affective evaluations of their work experiences, which subsequently enhance intrinsic motivation, work engagement, and organizational commitment. Satisfied employees tend to demonstrate greater dedication, accuracy, and initiative in performing their tasks. This result is consistent with the findings of Ningsih (2021), Oktavia (2023), and Yaso et al. (2023), who emphasize that job satisfaction is a critical determinant of individual performance. In manufacturing work environments such as PT Nutrisi Keluarga, satisfaction with job characteristics, leadership, promotion opportunities, and interpersonal relationships has been shown to significantly improve both the quality and quantity of work output. Accordingly, job satisfaction functions as a key psychological mechanism that bridges organizational factors and the achievement of optimal employee performance.

The results of the mediation analysis indicate that job satisfaction significantly mediates the relationship between perceived organizational support (POS) and employee performance; therefore, H5 is supported. This finding suggests that the influence of POS on employee performance does not occur solely through a direct pathway, but rather operates primarily through the enhancement of job satisfaction. This result reinforces the findings of Sharma and Biswakarma (2020), who demonstrated that job satisfaction fully mediates the relationship between perceived organizational support and job performance. High levels of organizational support foster employees' feelings of being valued and cared for, which subsequently enhance their job satisfaction. In turn, increased satisfaction promotes higher motivation, loyalty, and work quality. In the context of the present study, organizational support manifested in the form of structural fairness, supervisory attention, appropriate rewards, and favorable working conditions was found to significantly improve job satisfaction, which ultimately led to enhanced employee performance. Accordingly, job satisfaction serves as a key affective pathway through which organizational support is translated into superior performance outcomes.

The results of the moderation analysis indicate that the Dark Triad significantly moderates and weakens the relationship between ambidexterity and employee performance; therefore, H6 is supported. This finding suggests that the positive effect of ambidexterity on employee performance becomes weaker as the level of Dark Triad traits increases. Specifically, employees with high levels of Dark Triad traits tend to utilize flexibility, autonomy, and learning opportunities primarily for personal interests rather than collective organizational goals. As a result, their ambidextrous behaviors are less effectively translated into superior performance outcomes. In contrast, employees with lower levels of Dark Triad

traits are more likely to direct ambidextrous activities toward cooperation, shared learning, and organizational objectives, thereby strengthening the positive impact of ambidexterity on performance. This finding is consistent with the arguments of Ceptureanu et al. (2025) and Noviza et al. (2025), who emphasize that Dark Triad characteristics such as manipulation, self-centeredness, and low empathy—can undermine collaborative learning, knowledge sharing, and strategic alignment, all of which are essential for the effective implementation of ambidexterity. Accordingly, the Dark Triad functions as a critical negative boundary condition that constrains the effectiveness of ambidexterity in enhancing employee performance.

These results are consistent with previous studies by Nooshabadi et al. (2024) and extend an integrative model that considers ambidexterity, organizational support, job satisfaction, and employee dark personality traits in the Indonesian context, particularly in explaining both enhancing and weakening mechanisms in employee performance. Theoretically, this study reinforces the human resource management literature by highlighting the importance of the interaction between individual capabilities, organizational support, and personality traits in influencing performance, where dark personality traits may attenuate the positive effects of ambidexterity and organizational support.

The results of this study are presented systematically following the research objectives and hypotheses. The analysis was conducted based on the outputs of the structural model, which included testing for direct effects, mediating effects (indirect effects), and moderating effects. Each table and figure is formally referenced in accordance with academic writing standards, without specifying the location. Hypotheses were tested using t-statistics and p-values at a 5% significance level with a two-tailed approach. A relationship was considered significant if the t-statistic exceeded 1.97. Path coefficients were evaluated based on both statistical significance and practical relevance. The results of the direct effect tests are presented through the path coefficients between variables (Table 4).

Table 4. Structural Model Results (Direct, Indirect, and Moderating Effects)

Hypothesis	Path	β	t-value	p-value	Result
H1	AMD → PE	0.410	6.667	<0.001	Supported
H2	EDT → PE	0.122	2.580	0.010	Supported
H3	POS → JS	0.734	18.912	<0.001	Supported
H4	JS → PE	0.425	6.302	<0.001	Supported
H5	POS → JS → PE (Indirect)	0.312	5.732	<0.001	Supported
H6	EDT × AMD → PE (Moderation)	-0.112	2.048	0.041	Supported

Source: Data processed, 2025

Mediating effects occur when a third construct serves as an intermediary between two related constructs (Hair Jr. et al., 2021), as shown in Table 4.

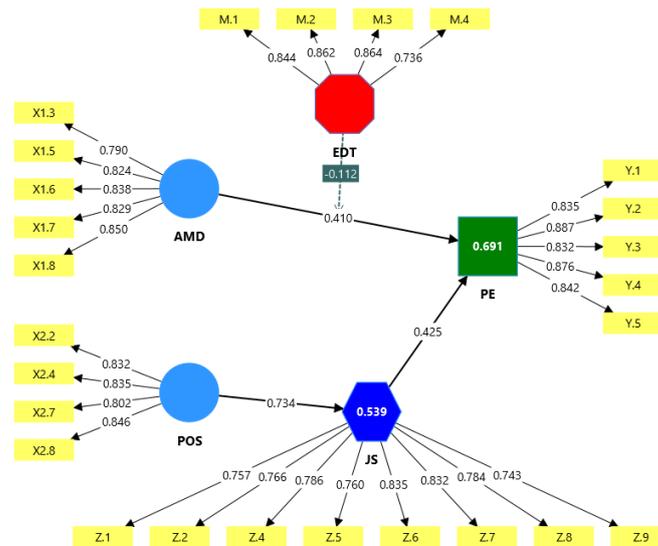


Figure 2. Outer Model

Source: Data processed, 2025

The findings of this study demonstrate that ambidexterity, perceived organizational support (POS), job satisfaction, and the Employee Dark Triad collectively influence employee performance, providing a comprehensive understanding of how individual capabilities, organizational resources, and personality traits interact in shaping work outcomes. Overall, the results indicate that employees’ ability to balance exploration and exploitation (ambidexterity) enhances performance, particularly when supported by organizational resources and positive psychological states. This confirms and extends ambidexterity theory (Slåtten et al., 2023), highlighting that ambidexterity is not only an organizational-level capability but also a critical individual-level competency that promotes creativity, efficiency, and adaptability. In practical terms, organizations can leverage this insight by creating opportunities for employees to explore innovative approaches while maintaining routine task efficiency through training, empowerment, and flexible work arrangements.

The study also highlights the central role of POS in fostering job satisfaction, which in turn enhances performance. This aligns with social exchange theory, which posits that employees reciprocate perceived organizational support with positive attitudes and behaviors (Park & Kim, 2024). Job satisfaction acts as a key mediating mechanism, translating the benefits of organizational support into tangible performance outcomes. This finding underscores the importance of integrating organizational support initiatives—such as recognition, transparent communication, and participative decision-making into human resource management strategies to maximize employee engagement and productivity.

Importantly, the study provides nuanced insights into the role of the Employee Dark Triad. While the direct effect of dark personality traits on performance was positive, reflecting prior observations that traits like strategic cunning (Machiavellianism) or overconfidence (narcissism) can enhance short-term performance in competitive contexts (Haar & de Jong, 2023), the Dark Triad also negatively moderates the relationship between ambidexterity and performance. This indicates that, although certain dark traits may offer immediate advantages, they can simultaneously disrupt the effective use of exploratory and exploitative capabilities, ultimately limiting the long-term benefits of ambidexterity. These findings expand the existing literature by demonstrating that dark personality traits have a dual effect: potentially beneficial in direct performance measures but detrimental when

complex cognitive and collaborative processes are required (Bueno-de la Fuente et al., 2025). Practically, this suggests that organizations should carefully manage dark traits through psychological assessment, monitoring, and targeted behavioral interventions.

Taken together, the results reveal an interconnected framework in which ambidexterity, POS, and job satisfaction function synergistically to enhance employee performance, while the Dark Triad introduces both opportunities and constraints depending on the context. Theoretically, this study contributes to human resource management and organizational behavior literature by integrating ambidexterity, organizational support, affective mechanisms, and personality traits into a single explanatory model. It highlights the mediating role of job satisfaction and the moderating influence of the Dark Triad, offering a more holistic understanding of performance determinants. From a practical standpoint, organizations seeking sustained performance improvements must simultaneously cultivate ambidextrous capabilities, foster supportive work environments, and manage the potential risks associated with dark personality traits (Pimentel et al., 2024).

The study demonstrates that optimal employee performance arises from a balance of individual competencies, organizational support, and careful management of personality influences. By empirically validating these interrelationships, the research not only confirms existing theories but also expands them, providing a robust framework for understanding how complex human and organizational factors collectively shape performance outcomes (Gul et al., 2025).

This study offers both theoretical and practical contributions. Theoretically, it extends human resource management literature by integrating ambidexterity, perceived organizational support, job satisfaction, and Employee Dark Triad characteristics in explaining employee performance. The findings highlight the importance of considering the interplay between individual capabilities, organizational support, and personality traits in enhancing performance outcomes. Practically, organizations can improve employee performance by developing ambidexterity, providing adequate organizational support, fostering job satisfaction, and managing the potential risks associated with dark personality traits through psychological assessments, supervision, and behavioral coaching.

Despite its contributions, this study has several limitations. First, the research sample was limited to employees of a single company, which may constrain the generalizability of the findings. Second, the cross-sectional design limits the ability to infer causality between variables. Third, self-reported measures may be subject to social desirability bias, especially for sensitive constructs such as the Dark Triad.

Future studies could address these limitations by expanding the sample across multiple organizations and industries to improve generalizability. Longitudinal designs would help to capture causal relationships over time. Additionally, combining self-reported data with objective performance metrics or supervisor ratings could reduce bias. Further research could also explore additional moderating or mediating variables, such as organizational culture or leadership style, to deepen the understanding of the mechanisms affecting employee performance.

CONCLUSIONS

This study demonstrates that ambidexterity and perceived organizational support (POS) significantly contribute to employee performance, with job satisfaction acting as a mediator between POS and performance. Employees who can balance exploration and exploitation exhibit higher adaptability and productivity, while organizational support enhances motivation, engagement, and work commitment. Meanwhile, Dark Triad

characteristics have a dual effect; although certain dark traits can boost short-term performance in competitive contexts, they also negatively moderate the effect of ambidexterity, indicating that manipulative, narcissistic, or psychopathic behaviors may undermine the effective deployment of individual strategic capabilities in complex and collaborative work contexts. These findings extend human resource management literature by presenting an integrative model that combines individual capabilities, organizational support, and dark personality traits as determinants of performance. Practically, organizations are advised to develop ambidexterity through training and empowerment, strengthen organizational support systems, and manage risks associated with the Employee Dark Triad to minimize potential negative impacts. The study's limitations include its cross-sectional design and focus on a single company in Indonesia, which may limit the generalizability of the findings. Future research is recommended to adopt longitudinal approaches, expand organizational contexts, and explore additional mediating or moderating variables to gain a more comprehensive understanding of the interactions between individual and organizational factors. Overall, this study provides both theoretical and practical contributions for developing strategies to enhance employee performance across various organizational settings.

REFERENCES

- Azmy, A., & Hartono, D. K. (2025). Examining the Impact of Ambidextrous Leadership on Employee Performance: The Mediating Roles of Organizational Citizenship Behavior and Psychological Empowerment in a Manufacturing Company. *Journal of Chinese Human Resources Management*, 16(1), 95–118. <https://doi.org/10.47297/wspchrmWSP2040-800506.20251601>
- Balzano, M., Bunjak, A., & Bortoluzzi, G. (2025). How relational and collective identification shape the relationship between individual ambidexterity and job performance. *European Management Review*, 22(3), 799–814. <https://doi.org/10.1111/emre.12684>
- Bueno-de la Fuente, C., Núñez-Rodríguez, S., de la Fuente-Anuncibay, R., & González-Bernal, J. J. (2025). Relationship Between Leadership, Personality, and the Dark Triad in Workplace: A Systematic Review. In *Behavioral Sciences* (Vol. 15, Number 3). Multidisciplinary Digital Publishing Institute (MDPI). <https://doi.org/10.3390/bs15030297>
- Ceptureanu, S. I., Ferraro, G., Ceptureanu, E. G., & Georgescu, B. (2025). Individual learning ambidexterity behavior and individual job performance in services: the role of organizational structure. *Review of Managerial Science*, 19(8), 2457–2492. <https://doi.org/10.1007/s11846-024-00819-0>
- Claudia, M. (2018). THE INFLUENCE OF PERCEIVED ORGANIZATIONAL SUPPORT, JOB SATISFACTION AND ORGANIZATIONAL COMMITMENT TOWARD ORGANIZATIONAL CITIZENSHIP BEHAVIOR (A Study of the Permanent Lecturers at University of Lambung Mangkurat, Banjarmasin). *Journal of Indonesian Economy and Business*, 33(1), 23–45. <http://journal.ugm.ac.id/jieb>
- Clauss, T., Kraus, S., Kallinger, F. L., Bican, P. M., Brem, A., & Kailer, N. (2021). Organizational ambidexterity and competitive advantage: The role of strategic agility in the exploration-exploitation paradox. *Journal of Innovation and Knowledge*, 6(4), 203–213. <https://doi.org/10.1016/j.jik.2020.07.003>
- Denovan, A., Plouffe, R. A., Dagnall, N., Artamonova, E., Kowalski, C. M., & Saklofske, D. H. (2024). Dark Triad, Dyad, or Core? A Psychometric Evaluation of the Short Dark

- Triad (SD3) Across Three Countries. *Current Psychology*, 43(47), 36086–36103. <https://doi.org/10.1007/s12144-024-07030-0>
- Dwiputri, L. J., & Surya Wanasida, A. (2024). Enrichment: Journal of Management The influence of perceived organizational support, training and development and employee engagement on employee performance mediated by employee engagement at the director's office PT XYZ. In *Enrichment: Journal of Management* (Vol. 14, Number 3).
- Elif, B., & Aslı, G. K. (2024). Moderating Effects of Dark Triad on the Relationships of Mobbing and Abusive Supervision with Outcomes. *Revista de Psicología Del Trabajo y de Las Organizaciones*, 40(2), 77–88. <https://doi.org/10.5093/jwop2024a7>
- Guenther, P., Guenther, M., Ringle, C. M., Zaefarian, G., & Cartwright, S. (2023). Improving PLS-SEM use for business marketing research. *Industrial Marketing Management*, 111, 127–142. <https://doi.org/10.1016/j.indmarman.2023.03.010>
- Gul, T., Karaatmaca, A. G., & Raza, A. (2025). Impact of Green Human Resources Management Practices on Sustainability Through Organizational Resilience and Organizational Learning in Pakistan's Banking Sector. *Sustainability (Switzerland)*, 17(5). <https://doi.org/10.3390/su17052087>
- Haar, J., & de Jong, K. (2023). Is the dark triad always detrimental to firm performance? Testing different performance outcomes and the moderating effects of competitive rivalry. *Frontiers in Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1061698>
- Huong Tran, T. T., den Broeke, M. Van, & Paparoidamis, N. G. (2025). The dual role of flexibility in driving innovation ambidexterity and firm performance. *Journal of Business Research*, 194. <https://doi.org/10.1016/j.jbusres.2025.115314>
- Ijigu, A. W., Alemu, A. E., & Kuhil, A. M. (2022). The mediating role of employee ambidexterity in the relationship between high-performance work system and employee work performance: An empirical evidence from ethio-telecom. *Cogent Business and Management*, 9(1). <https://doi.org/10.1080/23311975.2022.2135220>
- Kamal, A., & Kahar, A. (2025). The Influence of Perceived Organizational Support on Employee Performance Mediated by Work-Life Balance at The Balcone Suites & Resort Bukittinggi. *Journal of Multidimensional Management (JoMM)*, 1(1), 78–87. <https://doi.org/10.63076/jomm.v2i1.23>
- Khair, H., Jufrizen, Annisa, N., Ratih Pratiwi, & Abdul Rozak. (2024). Leader-Member Exchange, Perceived Organisational Support And Job Satisfaction: Mediating Role Of Employee Engagement. *Jurnal Manajemen*, 28(1), 64–87. <https://doi.org/10.24912/jm.v28i1.1638>
- Khusna, K., Hari Sukarno, & Salma Fauziyyah. (2025). Employee ambidexterity: The influence of entrepreneurial orientation on increasing competitive advantage in the tourism industry. *Annals of Human Resource Management Research*, 5(2), 141–158. <https://doi.org/10.35912/ahrmr.v5i2.2965>
- Li, G., & Chen, S. T. (2025). The Influence of Personality Traits on Employees' Creative Deviance: The Mediating Role of Job Crafting and the Moderating Role of Contextual Ambidexterity. *Journal of Logistics, Informatics and Service Science*, 12(4), 259–282. <https://doi.org/10.33168/JLISS.2025.0414>
- Liao, C., Guo, Z., Li, Y., Zheng, S., Shi, L., & Zhao, P. (2025). Service-sales ambidexterity and employee performance: a dual-path model of stress appraisal and regulatory focus. *Humanities and Social Sciences Communications*. <https://doi.org/10.1057/s41599-025-06432-0>

- Maan, A. T., Abid, G., Butt, T. H., Ashfaq, F., & Ahmed, S. (2020). Perceived organizational support and job satisfaction: a moderated mediation model of proactive personality and psychological empowerment. *Future Business Journal*, 6(1). <https://doi.org/10.1186/s43093-020-00027-8>
- Mascarenhas, C., Galvão, A. R., & Marques, C. S. (2022). How Perceived Organizational Support, Identification with Organization and Work Engagement Influence Job Satisfaction: A Gender-Based Perspective. *Administrative Sciences*, 12(2). <https://doi.org/10.3390/admsci12020066>
- Nabila, V., & Budiono. (2025). *Pengaruh job satisfaction terhadap employee performance melalui work engagement pada karyawan.*
- Nasution, M. I., Soemaryani, I., Yunizar, & Hilmiana. (2023). THE MEDIATING ROLE OF EMPLOYEE AMBIDEXTERITY AND WORK ENGAGEMENT FOR TALENT MANAGEMENT AND MEDICAL REPRESENTATIVES' PERFORMANCE IN INDONESIAN PHARMACEUTICAL COMPANIES. *Problems and Perspectives in Management*, 21(3), 642–655. [https://doi.org/10.21511/ppm.21\(3\).2023.50](https://doi.org/10.21511/ppm.21(3).2023.50)
- Ningsih, L. W. (n.d.). PENGARUH KEPUASAN KERJA TERHADAP KINERJA KARYAWAN MELALUI KOMITMEN AFEKTIF PADA PT CIPTA NIRMALA. In *Jurnal Ilmu Manajemen* (Vol. 9).
- Noviza, N., Aulia, A., & Dahlan, U. A. (2025). The Influence of Perceived Organizational Support on Contextual Performance Mediated by Job Satisfaction among Textile Industry Employees in Yogyakarta. *Insight: Jurnal Ilmiah Psikologi*, 27(1), 1693–2552. <https://doi.org/10.26486/psikologi.v27i1.3893>
- Oktavia, T. (2023). Human Capital, Job Satisfaction and Employee Performance. *International Journal Management Science and Business Journal Homepage*, 5(1), 19–28. <https://doi.org/10.17509/msb.v5i1>
- Pamungkas, W. A., & Tanuwijaya, J. (2025). Pengaruh Psychological Wellbeing dan Perceived Organizational Support Terhadap Job Performance dimediasi Job Satisfaction. *Jurnal Ilmiah FORKAMMA*, 9(1), 1–12. <https://doi.org/10.32493/skt.v6i1.23384>
- Park, J., & Kim, J. (2024). The Relationship between Perceived Organizational Support, Work Engagement, Organizational Citizenship Behavior, and Customer Orientation in the Public Sports Organizations Context. *Behavioral Sciences*, 14(3). <https://doi.org/10.3390/bs14030153>
- Pereira, L. M., Sanchez Rodrigues, V., & Freires, F. G. M. (2024). Use of Partial Least Squares Structural Equation Modeling (PLS-SEM) to Improve Plastic Waste Management. *Applied Sciences (Switzerland)*, 14(2). <https://doi.org/10.3390/app14020628>
- Pimentel, D., Lagarto, S., & Marques-Quinteiro, P. (2024). Examining Dark Triad Traits in Formal Leaders and Their Impact on Employee Workplace Stress: A Comparative Study of Family and Non-Family Businesses. *Businesses*, 4(3), 331–346. <https://doi.org/10.3390/businesses4030021>
- Roji, F., & Kurniawan, I. S. (2024). PENGARUH PERCEIVED ORGANIZATIONAL SUPPORT, MOTIVASI INTRINSIK, DAN PERSON JOB-FIT TERHADAP JOB SATISFACTION. *Jurnal Pendidikan Ekonomi (JURKAMI)*, 9(1), 53–62. <https://doi.org/10.31932/jpe.v9i1.3252>
- Sharma, D. R., & Biswakarma, G. (2020). Mediating Role of Job Satisfaction in the Relationship Between Organizational Support and Job Performance. *European Business & Management*, 6(4), 84. <https://doi.org/10.11648/j.ebm.20200604.13>

- Siregar, Z. M. E., Lubis, T., Syamsuri, Abd. R., Siregar, D. I., & Supriadi, Y. N. (2024). Job Satisfaction as Mediator in the Effect of Perceived Organizational Support on Employee Engagement: Evidence from SMEs in Indonesia. *Jurnal Aplikasi Manajemen*, 22(3), 767–782. <https://doi.org/10.21776/ub.jam.2024.022.03.11>
- Slåtten, T., Mutonyi, B. R., Nordli, A. J., & Lien, G. (2023). The role of ambidextrous leadership and employee ambidexterity in enhancing service quality of care and creativity – a study of health professionals. *BMC Health Services Research*, 23(1). <https://doi.org/10.1186/s12913-023-10275-3>
- Suwandana, G. M. (2025). The Role of Job Satisfaction in Mediating the Effect of Work Environment on Employee Performance. In *International Journal of Engineering Business and Social Science* (Vol. 3, Number 3). <https://ijebss.ph/index.php/ijebss>
- Upadhyay, D., & Baber, H. (2023). The Concept of the Dark Triad: Effect on Organizational Outcomes and Navigating Strategiess. *Changing Societies and Personalities*, 7(4), 158–173. <https://doi.org/10.15826/csp.2023.7.4.256>
- Yaso, I Made Suar, & Studi Manajemen, P. (2023). *VOLUME 6 ISSUE 2 FEBRUARI 2023 JURNAL KOLABORATIF SAINS 90 The Effect of Job Satisfaction and Workload on Employee Performance at PT. Sinar Galesong Pratama Palu*. <https://jurnal.unismuhpalu.ac.id/index.php/JKS>