

ARTIFICIAL INTELLIGENCE, SUSTAINABLE MANAGEMENT, AND ORGANIZATIONAL PERFORMANCE:



Evidence from Finance, Human Capital, and Digital Innovation



Edited by
Prof. Dr. Teena SINGH
Dr. Anurag Agnihotri



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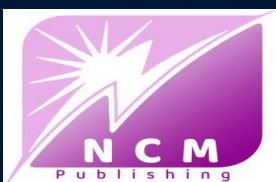
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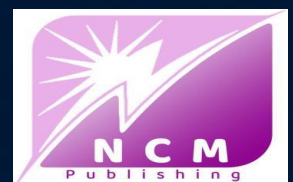
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Artificial Intelligence, Sustainable Management, and Organizational Performance: Evidence from Finance, Human Capital, and Digital Innovation



Editors

Prof. Dr. Teena SINGH
Dr. Anurag Agnihotri

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PREFACE

The accelerating pace of technological innovation, the growing importance of sustainable management, and the transformative impact of artificial intelligence are reshaping organizations across industries worldwide. As businesses strive to remain competitive in an increasingly digital and dynamic environment, integrating technological capabilities with effective human capital management and sound financial governance has become a strategic necessity. This volume, *Artificial Intelligence, Sustainable Management, and Organizational Performance: Evidence from Finance, Human Capital, and Digital Innovation*, brings together interdisciplinary research that reflects these contemporary developments.

The chapters examine a diverse range of topics, including artificial intelligence applications, digital accounting information systems, financial governance, green marketing, sustainable supply chain management, organizational culture, leadership, employee competencies, workplace productivity, visual communication, and financial performance analysis. Collectively, these contributions demonstrate how organizations can leverage technological innovation, sustainable management practices, and human capital development to enhance organizational performance and long-term resilience.

By combining perspectives from finance, management, information systems, marketing, and organizational behaviour, this book offers valuable insights for researchers, graduate students, practitioners, and policymakers. We hope that the ideas presented in this volume will encourage further interdisciplinary research and contribute to the development of innovative, sustainable, and high-performing organizations in the digital era.

Prof. Dr. Teena SINGH
Dr. Anurag Agnihotri
July 2026

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CHAPTER 1

Optimization of Financial Governance in the MSME Sector through FIFO Algorithm Integration in the Design of Web-Based Accounting Information Systems

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ABSTRACT

The majority of Micro, Small, and Medium Enterprises (MSMEs) in Indonesia continue to face challenges in managing business operations due to their reliance on manual transaction recording and inventory management processes. These practices often lead to data inconsistencies, recording errors, and difficulties in monitoring business performance. This research aims to develop Pilar POS, a web-based Point of Sale system designed to support MSMEs in managing sales transactions, product inventories, and business information more efficiently.

The system was developed using the Agile Development methodology, with Laravel serving as the primary web application framework, MySQL as the database management system, and Tailwind CSS for responsive user interface development. The platform integrates essential business management features, including product management, inventory monitoring, transaction processing, sales reporting, and user management within a centralized system.

The results of this study indicate that the implementation of Pilar POS simplifies operational workflows, improves data accuracy, and reduces the risks associated with manual record-keeping. Through its accessible and user-friendly interface, the system provides MSME owners with real-time business information that supports better decision-making and operational efficiency. Therefore, Pilar POS can serve as a practical digital solution that contributes to the digital transformation and competitiveness of MSMEs in the modern business environment.

Keywords: MSMEs, Point of Sale System, Laravel, MySQL, Tailwind CSS, Inventory Management..

Introduction

In the contemporary global economic ecosystem, Micro, Small, and Medium Enterprises (MSMEs) operate as the main engine for employment generation, regional innovation, and socioeconomic resilience. Despite their significant contributions, the sustainability of these enterprises is frequently threatened by systemic operational challenges, specifically regarding low literacy in financial administration and poor governance over working capital. In developing markets such as Indonesia, the digital transformation of small retail businesses remains heavily asymmetrical. Empirical data derived from the Business Fitness Index published by OCBC and NielsenIQ indicates that approximately 77 percent of local MSMEs continue to manage their operations through traditional manual ledger notebooks. This profound reliance on manual records means that a significant majority of small businesses lack access to an integrated financial infrastructure. Consequently, transaction documentation becomes highly fragmented, administrative error rates escalate, and operational data remains isolated, limiting the ability of business owners to assess corporate health or secure formal institutional financing. These operational vulnerabilities are typically exacerbated by a disconnect between cash flow management and inventory tracking. When sales tracking and stock valuation are handled through separate, manual workflows, businesses suffer from chronic inefficiencies, including hidden stockouts, capital tied up in slow-moving items, and unrecorded accounts receivable. Traditional software solutions, while abundant, fail to resolve these issues for small enterprises due to high subscription overheads, complex interfaces, and rigid deployment constraints. To address this technological gap, this research project introduces "Pilar POS" (accessible via coming soon), an open-access, web-based tool meticulously engineered to synthesize accounting workflows and stock controls into a unified, lightweight, and accessible system. Designed as a free public infrastructure asset, this platform automates bookkeeping while simultaneously structuring chronological stock movements via an integrated First-In, First-Out (FIFO) algorithmic pipeline. By delivering real-time processing capability, intuitive interface layouts, and zero-cost cloud deployment, Pilar POS aims to establish an operational standard for traditional merchants, helping them scale from manual operations to data-driven digital management.

1. LITERATURE REVIEW AND THEORETICAL FOUNDATION

The integration of advanced information technology within enterprise structures has deeply changed corporate cost accounting and resource management. Historically, automated enterprise point-of-sale and resource tools were accessible only to large corporations due to steep hardware investments and licensing barriers. However, the rise of modern web engineering has dramatically lowered these entry barriers. Traditional desktop applications are increasingly being replaced by web-based platforms and Progressive Web Applications (PWAs) that offer cross-platform flexibility, real-time cloud data synchronization, and lower local hardware requirements.

1.1 Human Error and Efficiency Constraints in Manual Bookkeeping

Academic research indicates that manual ledger tracking introduces significant administrative vulnerability into small-scale commercial environments. Keeping manual records requires substantial time and labor, while exposing the business to human error, including transcription mistakes, lost ledger sheets, and

mathematical discrepancies. These errors distort structural calculations like ending inventory valuation, gross profit margins, and tax documentation. By replacing these manual routines with automated software routines, businesses can minimize transaction recording lags, standardize accounting logs, and eliminate systemic mathematical errors. This automation directly translates to higher accounting accuracy and lower operational costs.

1.2 The Strategic Function of the FIFO Algorithm in Stock Management

Beyond basic accounting entry automation, effective inventory management is critical to safeguarding business liquidity and preventing working capital stagnation. Within small retail operations, failing to track the chronological flow of physical goods frequently causes inventory to spoil, degrade, or become obsolete. Implementing the First-In, First-Out (FIFO) methodology offers a clear technical remedy, ensuring that inventory items acquired earliest are systematically cleared from warehouses or shelves first. While the mathematical logic of FIFO is straightforward, applying it manually across multiple diverse product listings is operationally unfeasible for small merchants. Integrating an automated FIFO algorithmic ledger directly into a point-of-sale system allows small businesses to execute precise cost-of-goods-sold (COGS) computations and maintain realistic valuations of ending inventory, protecting profits from distortion by inflationary shifts.

2. SYSTEM ARCHITECTURE AND TECHNICAL DESIGN

The structural foundation of the Pilar POS platform is engineered to deliver high processing efficiency, robust data isolation, and smooth user experiences on low-tier mobile devices and desktop setups. Given that target merchants often operate under constrained digital conditions, optimizing web performance and minimizing network payloads were treated as primary engineering requirements during the design phase.

2.1 Frontend Optimization and Responsive UI Design

The application interface is developed using Laravel as the primary web framework, combined with Tailwind CSS for utility-first user interface styling and MySQL as the database management system. Laravel was selected for its robust MVC architecture, built-in security features, and efficient development workflow, enabling rapid and maintainable application development. Tailwind CSS provides a responsive and consistent user experience across various devices, while MySQL ensures reliable data storage and transaction processing. The user interface adopts an intuitive design approach, simplifying complex business operations into accessible and easy-to-understand workflows. The administrative dashboard offers real-time insights into business performance, including product inventory levels, stock availability, transaction history, sales activity, and revenue reports, allowing business owners to make informed decisions efficiently.

Table-1: Recapitulation of System Resource Financial Budget

No	Expense Category	Funding Source	Allocated Budget (IDR)
1	Technical Operations (Domain, Database, Maintenance)		2,845,000.00
2	Infrastructure Rental (Virtual Private Server hosting)		240,000.00
3	Field Transportation (Local Travel Costs)		1,000,000.00
4	Marketing & Communication (Social Media Ads, Internet)		850,000.00
Total Project Expenditure			4,935,000.00

2.2 Database Normalization and Cloud Storage Architecture

To secure sensitive financial and operational logs against data breaches and corruption, the backend data store utilizes an optimized relational model. Database schemas are structured to prevent redundancy and maximize query speeds during high-frequency checkouts. The deployment relies on efficient virtual private server (VPS) allocations and cloud data management to control hosting costs, as detailed in the project's financial planning in Table-1. To optimize the budget, open-source development frameworks were prioritized, allowing the engineering team to focus financial resources on highly secure database hosting and production server stability.

3. IMPLEMENTATION METHODOLOGY AND RESULT ANALYSIS

The deployment and refinement of Pilar POS followed a highly structured six-stage development cycle, transitioning from empirical field research to production deployment and systemic evaluation.

3.1 Field Observation and Requirement Synthesis

The development cycle began with direct field observations of small commercial setups. This fieldwork revealed consistent operational bottlenecks: physical invoices were frequently lost, accounting records were highly inaccurate, and stock counts were poorly organized. These recurring issues delayed day-to-day management decisions and caused unrecorded financial losses. In response, the team built system requirements around automation, designing features to digitize manual workflows, generate automatic financial statements, and automate stock valuation.

3.2 Agile Engineering and Iterative System Testing

The software engineering phase turned these synthesized requirements into a working platform using Next.js. During this phase, core system features—including automated double-entry ledger calculation, real-time balance sheet updates, and the FIFO inventory database engine—were implemented. Before launching publicly, the software underwent multi-stage usability and quality control evaluations. Testing focused on fixing runtime script bugs, verifying mathematical calculations within accounting modules, and optimizing data loads across mobile browsers to ensure a smooth user experience.

3.3 Deployment and Evaluation Analytics

Following successful system testing, Pilar POS was deployed to a production environment, making it directly accessible to merchant partners. Field evaluations confirmed that automating accounting processes minimized data errors caused by manual calculations, reduced administrative overhead, and gave business owners clearer visibility into operational health. All merchant feedback and software performance data are systematically documented to guide future update sprints.

CONCLUSION

The successful design, development, and deployment of the Pilar POS application demonstrate that modern web technologies can significantly improve financial and operational management for small and medium enterprises. By integrating point-of-sale functionality, transaction management, and inventory tracking into a single, centralized system, the application effectively addresses inefficiencies, reduces human error, and minimizes data fragmentation commonly associated with manual business processes.

System testing indicates that providing automated, real-time information on sales performance, inventory levels, and transaction activities enables business owners to make more accurate and data-driven decisions. Built using Laravel as the primary web development framework, MySQL as the database management system, and Tailwind CSS for responsive and modern user interface design, Pilar POS delivers a reliable, efficient, and user-friendly platform for daily business operations.

The application offers an accessible solution for businesses seeking digital transformation by streamlining operational workflows and improving data accuracy. Through the implementation of integrated business management features, Pilar POS establishes a practical foundation for enhancing productivity, operational effectiveness, and competitiveness within the modern digital economy.

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CHAPTER 2

The Effect of Gender Stereotypes on Leadership Aspiration: The Mediating Role of Self-Efficacy among Female Employees

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ABSTRACT

Although women's participation in the workforce continues to increase, women remain underrepresented in leadership positions due to gender stereotypes in the workplace. Leadership is often associated with masculine characteristics, causing women to experience lower confidence in their leadership abilities and decreasing their willingness to pursue leadership positions. This study aims to analyze the effect of gender stereotypes on leadership aspiration among female employees, with self-efficacy serving as a mediating variable. This study employs a quantitative approach using a survey method. Data will be collected through questionnaires distributed to female employees in Indonesia using purposive sampling techniques. The variables examined in this study include gender stereotypes, self-efficacy, and leadership aspiration. Data analysis will be conducted using Structural Equation Modeling-Partial Least Squares (SEM-PLS). The results are expected to show that gender stereotypes negatively affect women's self-efficacy and leadership aspiration. Furthermore, self-efficacy is expected to mediate the relationship between gender stereotypes and leadership aspiration. This study is expected to contribute to the women leadership literature and provide insights for organizations in creating more inclusive workplaces that support women's leadership development.

Keywords: Gender Stereotypes, Self-Efficacy, Leadership Aspiration, Women Leadership, Female Employees.

1. INTRODUCTION

Despite the increasing participation of women in the workforce, their representation in leadership positions remains disproportionately low across industries and countries. Recent reports indicate that although progress has been made in improving gender diversity in organizations, women continue to occupy fewer senior leadership roles than men, reflecting persistent structural and cultural barriers to leadership advancement (Reuters, 2025). One of the most influential barriers is the persistence of gender stereotypes that associate leadership with masculine traits such as assertiveness, dominance, and decisiveness, while women are often perceived as more communal, nurturing, and relationship-oriented (Darvin et al., 2025).

According to Social Role Theory, societal expectations regarding gender roles shape perceptions of appropriate behaviors for men and women. Because leadership characteristics are traditionally aligned with masculine attributes, women often face a perceived incongruity between their gender role and leadership role expectations. This phenomenon may lead women to underestimate their leadership potential and reduce their interest in pursuing leadership positions (Eagly & Karau, 2002). Although many organizations have implemented diversity and inclusion initiatives, gender stereotypes continue to influence promotion opportunities, leadership evaluations, and career aspirations among female employees (Darvin et al., 2025).

The influence of gender stereotypes extends beyond external evaluations and may affect women's psychological resources, particularly self-efficacy. Self-efficacy refers to an individual's belief in their capability to successfully perform specific tasks and achieve desired outcomes (Bandura, 1997). Previous studies suggest that women frequently report lower self-efficacy than men despite demonstrating comparable or even superior performance levels. Such discrepancies are often attributed to gendered socialization processes and stereotype-based expectations that undermine women's confidence in their abilities (Whitcomb et al., 2020). In leadership contexts, self-efficacy plays a crucial role because individuals with higher confidence in their leadership capabilities are more likely to pursue leadership opportunities, persist in challenging situations, and aspire to higher organizational positions (Foster et al., 2024).

Leadership aspiration, defined as an individual's desire and intention to attain leadership positions, has become an increasingly important topic in organizational research. Organizations worldwide face leadership succession challenges, and understanding factors that encourage or hinder employees' leadership ambitions is essential for talent development. Research has shown that workplace experiences and psychological factors significantly influence leadership aspiration, particularly among women who often encounter gender-related barriers in their career progression (Plückelmann et al., 2025). Furthermore, studies indicate that gender-related perceptions and self-confidence are closely associated with women's willingness to pursue leadership roles (Wang & Wareewanich, 2024).

Although previous studies have examined gender stereotypes, self-efficacy, and leadership outcomes separately, limited research has investigated the underlying mechanism through which gender stereotypes influence leadership aspiration among female employees, particularly in emerging economies such as Indonesia. Existing studies have primarily focused on Western contexts, female students, or women already occupying leadership positions, leaving a gap in understanding how workplace gender stereotypes affect leadership aspirations among female employees in developing countries. Moreover, empirical evidence regarding the mediating role of self-efficacy in this relationship remains limited and inconclusive.

To address this gap, the present study examines the effect of gender stereotypes on leadership aspiration among female employees, with self-efficacy serving as a mediating variable. By investigating these relationships within the Indonesian context, this study contributes to the growing literature on women's leadership and provides practical insights for organizations seeking to develop inclusive workplaces that support women's leadership advancement. The findings are expected to enrich theoretical understanding regarding the psychological mechanisms linking gender stereotypes and leadership aspiration while offering

managerial implications for enhancing female leadership development.

This study employs a quantitative approach to examine the relationships among gender stereotypes, self-efficacy, and leadership aspiration among female employees in Indonesia. Specifically, this study aims to investigate whether gender stereotypes influence leadership aspiration directly and indirectly through self-efficacy as a mediating mechanism. Accordingly, the study addresses the following research questions: (1) Do gender stereotypes significantly affect self-efficacy among female employees? (2) Does self-efficacy significantly influence leadership aspiration? (3) Do gender stereotypes directly affect leadership aspiration? and (4) Does self-efficacy mediate the relationship between gender stereotypes and leadership aspiration?

This study offers several contributions to the existing literature. First, it extends previous studies by integrating Social Role Theory and Social Cognitive Theory to explain the mechanism underlying women's leadership aspirations. Second, unlike previous research that primarily focused on Western countries, students, or women already occupying leadership roles, this study focuses on female employees in Indonesia as an emerging economy context. Third, the findings are expected to provide practical implications for organizations in designing leadership development programs and creating more inclusive workplace environments that strengthen women's confidence and leadership opportunities.

2. THEORETICAL FRAMEWORK

2.1 Theoretical Foundation

This study is grounded in Social Role Theory (Eagly, 1987; Eagly & Karau, 2002) and Social Cognitive Theory (Bandura, 1986, 1997). Social Role Theory suggests that societal expectations shape perceptions regarding the roles and behaviors considered appropriate for men and women. Traditionally, men are associated with agentic characteristics such as assertiveness, competitiveness, and independence, whereas women are associated with communal characteristics such as empathy, warmth, and cooperation (Eagly & Karau, 2002). Because leadership roles are often linked to agentic traits, women may be perceived as less suitable for leadership positions, creating barriers to their advancement.

Meanwhile, Social Cognitive Theory explains how environmental and social factors influence individual beliefs and behaviors through cognitive mechanisms. One of the most important cognitive mechanisms is self-efficacy, defined as an individual's belief in their ability to successfully perform specific tasks and achieve desired outcomes (Bandura, 1997). In organizational settings, self-efficacy influences career decisions, persistence, motivation, and leadership development. Therefore, gender stereotypes may influence women's leadership aspirations by shaping their self-efficacy beliefs.

Together, these theories provide a comprehensive explanation of how gender stereotypes operate as social constraints that influence women's confidence in their leadership capabilities and ultimately affect their willingness to pursue leadership positions.

2.2 Gender Stereotypes

Gender stereotypes refer to widely shared beliefs regarding the attributes, behaviors, and roles that are considered appropriate for men and women (Hentschel et al., 2019). In organizational contexts, leadership is frequently associated with masculine characteristics such as decisiveness, authority, and competitiveness, whereas women are often expected to display communal characteristics such as nurturing and cooperation. As a result, women may face bias when pursuing leadership positions because they are perceived as less congruent with traditional leadership expectations.

Despite significant progress in workplace gender equality, gender stereotypes remain prevalent across

industries and organizational levels. Recent research demonstrates that women continue to encounter stereotype-based evaluations regarding their competence, leadership potential, and suitability for managerial roles (Darvin et al., 2025). Such stereotypes can create both external barriers, including discriminatory evaluations and promotion decisions, and internal barriers, including reduced confidence and diminished leadership ambition.

Furthermore, stereotype-based expectations may become internalized over time. When women are repeatedly exposed to messages suggesting that leadership is a masculine domain, they may begin to question their own leadership capabilities. Consequently, gender stereotypes can influence not only how women are evaluated by others but also how they evaluate themselves.

2.3 Self-Efficacy

Self-efficacy refers to an individual's belief in their capability to organize and execute the actions required to achieve specific goals (Bandura, 1997). Self-efficacy plays a central role in determining how individuals think, feel, motivate themselves, and behave. Individuals with high self-efficacy tend to embrace challenges, demonstrate greater resilience, and persist when encountering obstacles. Conversely, individuals with low self-efficacy are more likely to avoid challenging situations and underestimate their capabilities.

In leadership contexts, self-efficacy has been recognized as a critical factor influencing leadership emergence, leadership effectiveness, and leadership aspirations. Employees who believe in their ability to lead others are more likely to seek leadership opportunities, accept challenging assignments, and pursue career advancement. Foster et al. (2024) found that leadership self-efficacy significantly contributes to the development of emerging female leaders by strengthening their confidence and readiness to assume leadership responsibilities.

Recent studies further suggest that women often report lower levels of self-efficacy than men despite demonstrating comparable levels of performance and competence (Whitcomb et al., 2020). This discrepancy is frequently attributed to social expectations and gender-based stereotypes that shape women's perceptions of their own abilities. Therefore, understanding the antecedents of self-efficacy is essential for explaining women's leadership aspirations.

2.4 Leadership Aspiration

Leadership aspiration refers to an individual's desire, intention, and motivation to attain leadership positions in the future (Chan & Drasgow, 2001). Leadership aspiration represents an important precursor to leadership attainment because individuals who aspire to leadership roles are more likely to engage in developmental activities, seek leadership opportunities, and pursue career advancement.

Previous research suggests that leadership aspiration is influenced by both individual and contextual factors. Individual factors include self-confidence, self-efficacy, leadership identity, and career motivation, whereas contextual factors include organizational culture, leadership opportunities, and social expectations (Plückelmann et al., 2025). For women, leadership aspiration is particularly important because aspirations often precede actual leadership attainment. However, gender-related barriers may discourage women from pursuing leadership positions even when they possess the necessary qualifications and competencies.

Research has shown that women are less likely than men to envision themselves in leadership roles when they perceive leadership environments as gender biased or inconsistent with female gender roles (Wang & Wareewanich, 2024). Consequently, understanding the factors that shape women's leadership aspirations remains an important area of organizational research.

2.5 Hypothesis Development

Gender Stereotypes and Self-Efficacy

According to Social Cognitive Theory, environmental factors influence behavior through cognitive processes, particularly self-efficacy beliefs (Bandura, 1997). Gender stereotypes represent a significant environmental influence that can shape how women perceive their abilities and potential. When leadership is consistently portrayed as a masculine role, women may receive fewer signals that reinforce their leadership capabilities, thereby weakening their confidence in their own leadership potential.

Empirical evidence supports this argument. Studies have found that stereotype-based expectations negatively affect women's confidence, career self-perceptions, and leadership-related beliefs (Darvin et al., 2025). Similarly, Wang and Wareewanich (2024) reported that gender-related perceptions significantly influence women's leadership self-efficacy. Women who perceive stronger gender barriers often report lower confidence in their ability to lead effectively.

Therefore, gender stereotypes are expected to undermine female employees' self-efficacy by reducing their confidence in their leadership capabilities.

H1: Gender stereotypes negatively affect self-efficacy among female employees.

Self-Efficacy and Leadership Aspiration

Self-efficacy plays a critical role in determining career-related decisions and ambitions. Individuals who believe they can successfully perform leadership responsibilities are more likely to pursue leadership opportunities and develop long-term leadership goals. Conversely, individuals with low self-efficacy may avoid leadership roles due to concerns about failure or inadequate performance.

Bandura (1997) argued that self-efficacy influences the goals individuals set for themselves, the effort they exert, and their persistence when facing difficulties. In organizational settings, employees with higher self-efficacy are generally more ambitious and proactive in pursuing leadership opportunities.

Recent research confirms that self-efficacy is a significant predictor of women's leadership development and leadership aspirations (Foster et al., 2024). Women who possess strong confidence in their leadership capabilities are more likely to seek advancement opportunities, participate in leadership development programs, and aspire to managerial positions.

Accordingly, the following hypothesis is proposed:

H2: Self-efficacy positively affects leadership aspiration among female employees.

Gender Stereotypes and Leadership Aspiration

Gender stereotypes may also directly influence leadership aspiration. Social Role Theory suggests that individuals are more likely to pursue roles that are perceived as congruent with their social identity (Eagly & Karau, 2002). Because leadership is often viewed as a masculine role, women may perceive leadership positions as less attainable or less appropriate for themselves.

Research indicates that stereotype-based perceptions can reduce women's willingness to seek promotions and leadership opportunities. Women exposed to stronger gender stereotypes often report lower career ambitions and reduced interest in leadership positions (Plückelmann et al., 2025). Moreover, gender stereotypes may contribute to self-limiting beliefs that discourage women from envisioning themselves as future leaders.

Consequently, gender stereotypes are expected to reduce women's leadership aspirations.

H3: Gender stereotypes negatively affect leadership aspiration among female employees.

The Mediating Role of Self-Efficacy

Although gender stereotypes may directly influence leadership aspiration, their impact may also occur indirectly through self-efficacy. Social Cognitive Theory proposes that environmental influences affect behavior through cognitive mechanisms, with self-efficacy serving as one of the most influential mechanisms (Bandura, 1997).

In the context of this study, gender stereotypes may reduce women's confidence in their leadership abilities, thereby lowering their motivation to pursue leadership positions. When women perceive that leadership is inconsistent with societal expectations of femininity, they may develop lower self-efficacy, which subsequently diminishes their leadership aspirations.

Previous studies have highlighted the mediating role of self-efficacy in explaining how social and organizational barriers influence career-related outcomes among women. Self-efficacy has consistently been identified as a psychological mechanism through which environmental constraints affect leadership development and career aspirations.

Therefore, this study proposes the following hypothesis:

H4: Self-efficacy mediates the relationship between gender stereotypes and leadership aspiration among female employees.

2.6 Research Framework

Based on Social Role Theory and Social Cognitive Theory, this study proposes that gender stereotypes negatively influence self-efficacy and leadership aspiration among female employees. Furthermore, self-efficacy is expected to positively influence leadership aspiration and mediate the relationship between gender stereotypes and leadership aspiration. The conceptual framework of this study is presented in Figure 1.

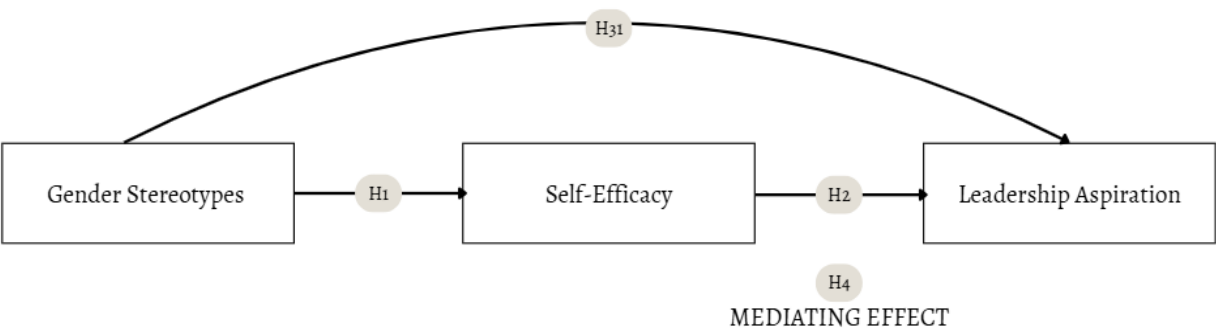


Figure 1. Research Framework

3.METHOD

3.1 Research Design

This study employs a quantitative research approach to examine the relationships among gender stereotypes, self-efficacy, and leadership aspiration among female employees in Indonesia. A cross-sectional survey design will be utilized to collect data from respondents at a single point in time. The quantitative approach is considered appropriate because it enables the testing of causal relationships among variables and the validation of the proposed theoretical framework through statistical analysis.

The study is grounded in Social Role Theory (Eagly & Karau, 2002) and Social Cognitive Theory (Bandura, 1997), which provide the theoretical basis for examining the direct and indirect effects of gender stereotypes on leadership aspiration through self-efficacy. The proposed research model includes one independent variable (gender stereotypes), one mediating variable (self-efficacy), and one dependent variable (leadership aspiration).

3.2 Population and Sample

The target population of this study consists of female employees working in various industries across Indonesia. Female employees are selected because women continue to face gender-related challenges in career advancement and remain underrepresented in leadership positions despite increasing workforce participation.

A purposive sampling technique will be employed to ensure that respondents meet specific criteria relevant to the research objectives. To be eligible for participation, respondents must: (1) be female employees, (2) be at least 18 years old, and (3) have a minimum of one year of work experience in their current organization. These criteria are established to ensure that participants have sufficient workplace experience to evaluate gender stereotypes and leadership-related perceptions within their organizational environment.

Considering that this study will use Partial Least Squares Structural Equation Modeling (PLS-SEM), the minimum sample size will follow the recommendations of Hair et al. (2022). A minimum sample of 200 respondents is considered adequate to achieve reliable and robust statistical results. However, the study will aim to collect a larger sample to enhance statistical power and generalizability.

3.3 Data Collection Procedure

Primary data will be collected using a structured online questionnaire distributed through various digital platforms, including social media, professional networking platforms, and online communities of working women. The questionnaire will be administered using Google Forms to facilitate broader geographical coverage and increase accessibility for respondents.

Before the full-scale data collection, a pilot test will be conducted with a small group of respondents to evaluate the clarity, reliability, and comprehensibility of the questionnaire items. Feedback from the pilot study will be used to refine the measurement instrument before the main survey is administered.

Participation in the survey will be voluntary, and respondents will be informed about the purpose of the study. Confidentiality and anonymity will be ensured throughout the research process. No personally identifiable information will be collected, and all responses will be used solely for academic purposes.

3.4 Measurement of Variables

All constructs in this study will be measured using previously validated scales adapted from prior literature. Responses will be assessed using a five-point Likert scale ranging from 1 (“strongly disagree”) to 5 (“strongly agree”).

Gender Stereotypes

Gender stereotypes refer to beliefs and perceptions regarding gender-based roles and characteristics in the workplace. This construct will be measured using items adapted from previous studies on workplace gender stereotypes and leadership perceptions (Hentschel et al., 2019; Koenig et al., 2011). Sample items include perceptions regarding the suitability of women for leadership positions and gender-based expectations of leadership behavior.

Self-Efficacy

Self-efficacy refers to an individual's belief in their capability to successfully perform leadership-related tasks and responsibilities. This construct will be measured using adapted items from the General Self-Efficacy Scale developed by Schwarzer and Jerusalem (1995) and leadership self-efficacy studies. Higher scores indicate stronger confidence in one's ability to perform effectively in challenging situations and leadership roles.

Leadership Aspiration

Leadership aspiration refers to an individual's desire, intention, and motivation to pursue leadership positions in the future. This construct will be measured using items adapted from Chan and Drasgow's (2001) Motivation to Lead framework and subsequent leadership aspiration studies. Higher scores indicate a stronger willingness to seek leadership opportunities and assume leadership responsibilities.

3.5 Data Analysis Technique

Data analysis will be conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) through SmartPLS software. PLS-SEM is selected because it is suitable for predictive research models, accommodates complex relationships among latent variables, and performs effectively with non-normal data distributions (Hair et al., 2022).

The analysis will be conducted in two stages: measurement model assessment and structural model assessment.

First, the measurement model will be evaluated to assess construct reliability and validity. Reliability will be examined using Cronbach's Alpha and Composite Reliability (CR), with recommended threshold values above 0.70. Convergent validity will be assessed through Average Variance Extracted (AVE), where values above 0.50 indicate adequate convergent validity. Discriminant validity will be evaluated using the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT). Second, the structural model will be assessed to examine the proposed hypotheses. The significance of path coefficients will be evaluated using the bootstrapping procedure with 5,000 resamples. The coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and path significance will be analyzed to determine the explanatory and predictive power of the model.

Finally, mediation analysis will be performed to examine the indirect effect of gender stereotypes on leadership aspiration through self-efficacy. The mediation effect will be assessed using the bootstrapping approach recommended by Hair et al. (2022).

4. RESULTS AND DISCUSSION

Gender stereotypes, self-efficacy, and leadership aspiration are the latent variables examined in this study. Structural analysis using PLS-SEM was employed to investigate the relationships among constructs and their respective indicators. The testing procedure consisted of evaluating both the outer model and the inner model. An outer loading value of ≥ 0.70 indicates that an indicator has a strong reflective relationship with its latent construct. The hypotheses proposed in this study were tested through inner model analysis using the bootstrapping method.

4.1 Measurement Model Evaluation

The measurement model evaluation was conducted to assess the validity and reliability of the data for each construct, namely gender stereotypes, self-efficacy, and leadership aspiration. In this stage, convergent validity was first examined through the assessment of factor loadings and Average Variance Extracted (AVE) values. A construct is considered to have adequate validity when the loading factor is ≥ 0.70 and the AVE value is ≥ 0.50 (Al-Fraihat et al., 2020; Hariyanto et al., 2022; Parmin et al., 2021; Saifurrahman et al., 2021). The results of the PLS-SEM measurement model are presented in Figure 2, while the results of convergent validity and internal consistency reliability are shown in Table 1.

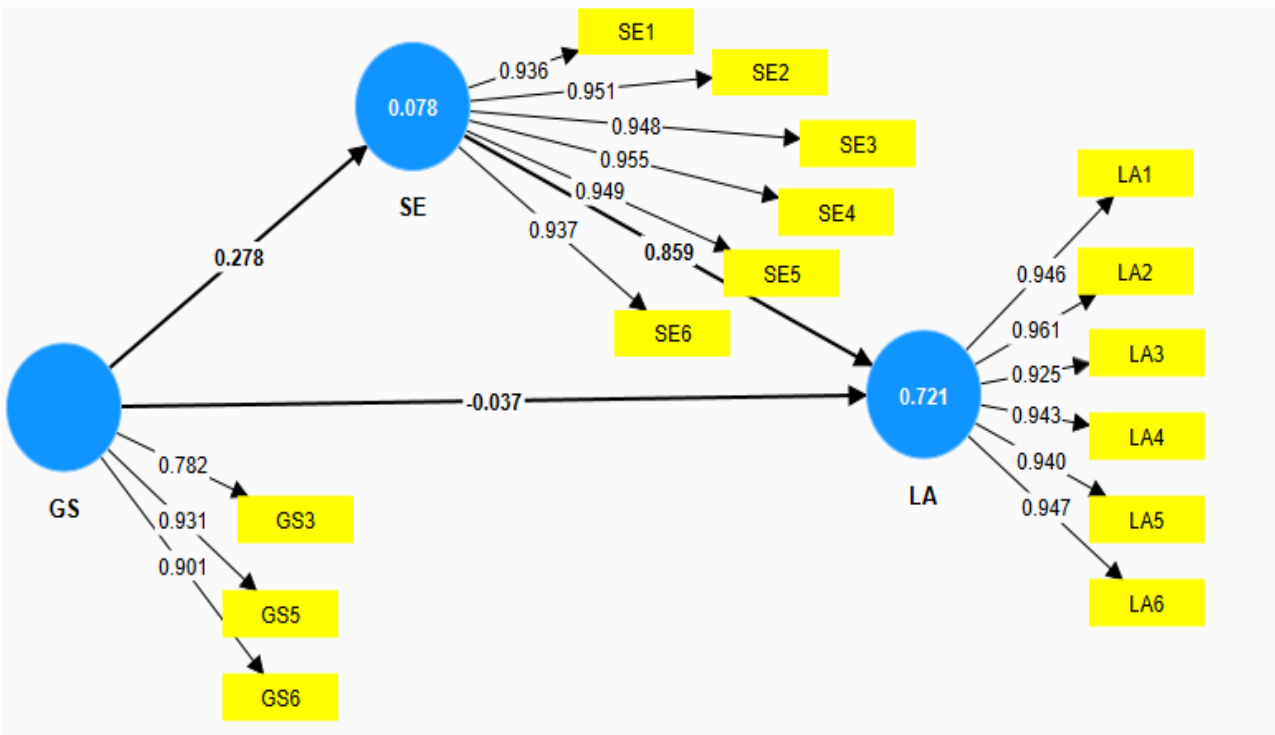


Figure 2. Results of PLS-SEM

Table 2. Results of Convergent Validity and Internal Consistency Reliability

No	Variable	Indicator	Construct	FL ($>0,70$)	CA ($>0,70$)	Rho_A ($>0,70$)	Rho_A ($>0,70$)	AVE ($>0,50$)
1	Gender Stereotypes	Female employees face greater barriers to obtaining leadership positions.	G3	0.782	0.846	0.889	0.906	0.763
		Women need to demonstrate greater competence than men to be perceived as capable leaders.	G5	0.931				
		Masculine characteristics are more frequently associated with	G6	0.901				
2	Self-Efficacy	I am confident in my ability to lead a team effectively.	SE1	0.946	0.976	0.977	0.980	0.891

		I am confident that I can make good decisions in leadership situations	SE2	0.961				
		I am able to motivate others to achieve shared goal	SE3	0.925				
		I feel confident when given responsibility within a group.	SE4	0.943				
		I am confident that I can handle challenges as a leader.	SE5	0.940				
		I am able to exert a positive influence on others in the workplace.	SE6	0.947				
3	Leadership Aspiration	I aspire to hold a leadership position in the future.	LA1	0.936	0.976	0.977	0.981	0.895
		I am interested in taking on managerial responsibilities.	LA2	0.951				
		Becoming a leader is one of my career goals.	LA3	0.948				

		I am motivated to develop my leadership skills.	LA4	0.955				
		I would like to take on greater responsibilities within an organization.	LA5	0.949				
		I see myself occupying a leadership position in the future.	LA6	0.937				

Based on Table 2, all indicators have factor loading values above 0.70. The AVE values for the GS, LA, and SE constructs are 0.763, 0.891, and 0.895, respectively, exceeding the minimum threshold of 0.50. In addition, the Cronbach’s Alpha, rho_A, and Composite Reliability values for all constructs are above 0.70, indicating excellent reliability. Therefore, all constructs in this study have met the criteria for convergent validity and reliability. Furthermore, the results of the discriminant validity assessment using the Fornell–Larcker Criterion show that the square root of the AVE for each construct (GS = 0.873, LA = 0.944, and SE = 0.946) is greater than the correlations with other constructs. Therefore, all constructs are considered to have satisfactory discriminant validity and are suitable for use in the structural model analysis.

Table 3. Fornell-Larcker results

	GS	LA	SE
GS	0.873		
LA	0.203	0.944	
SE	0.278	0.848	0.946

4.2 Structural Model Evaluation

Structural Equation Modeling (SEM) is an analytical approach used to describe and predict causal relationships among latent variables. These causal relationships were examined using the bootstrapping method. The initial stage of structural model analysis involved assessing the f^2 , R^2 , and Q^2 values. The magnitude of the effect between variables is indicated by the f^2 value. A Q^2 value greater than 0.00 is considered acceptable. The criteria used for evaluating the structural model are presented in Table 4.

Table 4. Structural Model

Relationship/Variable	f ²	Effects	R ²	Effects	Q ²	Effects
GS → LA	0.004	Negligible	0.721	Substantial	0.634	Large Predictive Relevance
GS → SE	0.084	Small	0.078	Weak	0.065	Small Predictive Relevance
LA → SE	2.439	Large	0.078	Weak	0.065	Small Predictive Relevance

Based on Table 4, the R² value of Self-Efficacy was 0.721, indicating that Gender Stereotypes explained 72.1% of the variance in Self-Efficacy, which can be categorized as substantial. Meanwhile, the R² value of Leadership Aspiration was 0.078, indicating weak explanatory power. The Q² values for Self-Efficacy and Leadership Aspiration were 0.634 and 0.065, respectively, suggesting that the model possesses predictive relevance, with strong predictive relevance for Self-Efficacy and small predictive relevance for Leadership Aspiration.

Regarding effect size (f²), the effect of Gender Stereotypes on Self-Efficacy was negligible (f² = 0.004), while the effect of Gender Stereotypes on Leadership Aspiration was small (f² = 0.084). In contrast, Self-Efficacy had a large effect on Leadership Aspiration (f² = 2.439). These results indicate that Self-Efficacy plays a dominant role in explaining Leadership Aspiration compared to Gender Stereotypes.

4.3 Hypothesis Testing

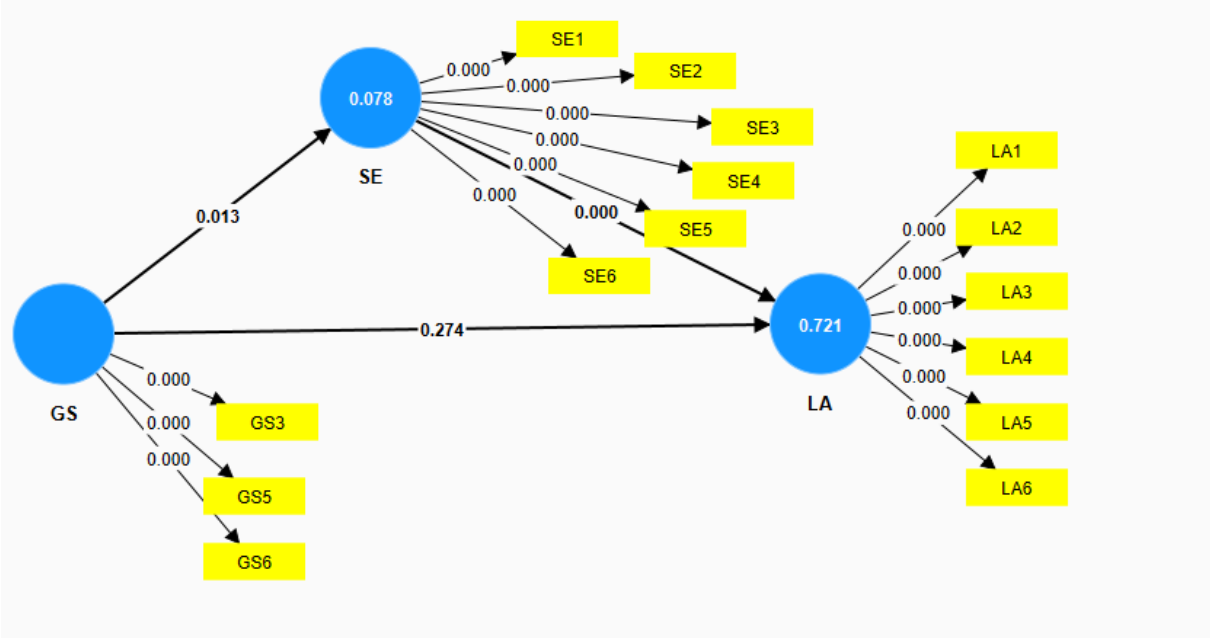


Table 5. Results of Hypothesis Test

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
GS → LA	-0.037	-0.033	0.061	0.601	0.274
GS → SE	0.278	0.287	0.125	2.231	0.013
SE → LA	0.859	0.853	0.050	17.284	0.000
GS → SE → LA	0.239	0.247	0.110	2.176	0.015

The empirical findings of this study provide valuable insights into the psychological and structural mechanisms influencing the leadership aspirations of female employees in Indonesia. By integrating Social Role Theory and Social Cognitive Theory, this study explains how gender stereotypes as an environmental factor interact with self-efficacy as an internal cognitive factor in shaping women's leadership ambitions. Overall, the structural model suggests that internal psychological factors play a more important role in fostering leadership aspirations than direct social pressures or workplace barriers.

The first hypothesis produced an interesting finding regarding the relationship between gender stereotypes and self-efficacy. The bootstrapping results show that the GS → SE path has a coefficient of 0.278, a T-statistic of 2.231, and a p-value of 0.013, indicating a significant positive relationship. Therefore, H1, which predicted a negative effect, is not supported. Contrary to previous studies suggesting that gender stereotypes undermine women's confidence, the findings indicate that awareness of gender stereotypes may encourage psychological resilience. When women recognize the need to demonstrate greater competence to be viewed as capable leaders, they become more motivated to improve their performance and abilities, which ultimately strengthens their self-efficacy.

The second hypothesis received strong support. The SE → LA path shows a coefficient of 0.859, a T-statistic of 17.284, and a p-value of 0.000, indicating that self-efficacy has a strong positive effect on leadership aspiration. This finding confirms that confidence in one's leadership abilities is a key driver of women's ambition to pursue leadership roles and managerial responsibilities.

In contrast, the third hypothesis was not supported. The GS → LA path produced a coefficient of -0.037, a T-statistic of 0.601, and a p-value of 0.274, indicating that gender stereotypes do not directly affect leadership aspiration. This suggests that the existence of gender stereotypes does not automatically reduce women's career ambitions as long as their confidence in their abilities remains intact.

The fourth hypothesis revealed that the indirect path GS → SE → LA has a coefficient of 0.239, a T-statistic of 2.176, and a p-value of 0.015, supporting H4 and indicating full mediation. This finding suggests that gender stereotypes influence leadership aspirations indirectly through self-efficacy. Interestingly, gender stereotypes in this study function not as barriers but as stimuli that encourage women to strengthen their competence and confidence. Therefore, organizations seeking to increase women's representation in leadership positions should focus on enhancing self-efficacy through mentoring programs, leadership training, and greater opportunities for leadership development.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

This study examined the relationships among gender stereotypes, self-efficacy, and leadership aspiration among female employees in Indonesia by integrating Social Role Theory and Social Cognitive Theory. The findings reveal that gender stereotypes have a significant positive effect on self-efficacy, suggesting that awareness of gender-related challenges may encourage female employees to strengthen their competence and confidence rather than diminish them. Furthermore, self-efficacy was found to have a strong positive effect on leadership aspiration, indicating that confidence in one's leadership abilities is a key determinant of women's willingness to pursue leadership roles.

In contrast, gender stereotypes did not have a significant direct effect on leadership aspiration. This finding suggests that the existence of gender stereotypes alone is insufficient to directly influence women's leadership ambitions. Instead, their impact operates through internal psychological mechanisms. The mediation analysis confirmed that self-efficacy fully mediates the relationship between gender stereotypes and leadership aspiration. Therefore, self-efficacy serves as the primary mechanism through which environmental perceptions and social expectations are translated into leadership ambitions.

Overall, the study highlights the crucial role of self-efficacy in shaping leadership aspirations among female employees. The findings contribute to the literature on women's leadership by demonstrating that internal cognitive resources may be more influential than external barriers in determining women's career ambitions and readiness to pursue leadership positions.

5.2 Recommendations

Based on the findings, organizations should prioritize initiatives aimed at strengthening female employees' self-efficacy. This can be achieved through leadership development programs, mentoring and coaching initiatives, skills enhancement training, and opportunities for women to lead strategic projects. Such initiatives may help women build confidence in their leadership capabilities and increase their willingness to pursue managerial and executive positions.

Organizations should also continue promoting inclusive workplace cultures that recognize and support women's leadership potential. Although gender stereotypes did not directly reduce leadership aspirations in this study, reducing bias and creating equal opportunities remain important for fostering a supportive environment in which women can develop professionally.

For future research, it is recommended to examine additional factors that may influence women's leadership aspirations, such as organizational support, work-life balance, career advancement opportunities, leadership identity, and mentoring relationships. Future studies may also expand the sample across different industries and cultural contexts to improve the generalizability of the findings. Furthermore, longitudinal research could provide deeper insights into how self-efficacy and leadership aspirations evolve throughout women's career development.

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CHAPTER 3

Managing the Role of Graphic Designers in Strengthening Visual Identity and Visitor Experience at Art Jakarta Gardens 2026

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ABSTRACT

Art Jakarta Gardens 2026 provides an important context for examining the strategic role of graphic designers in managing visual communication within contemporary art events. Held at Hutan Kota by Plataran, Jakarta, the event combines contemporary art, urban green space, gallery presentations, public programs, sculptural works, and visitor-oriented experiences within an open-air exhibition format. This study examines how graphic designers manage visual identity, support communication clarity, strengthen environmental navigation, and shape visitor experience within the event ecosystem. The research employs a qualitative descriptive single case study method. Data were collected through visual observation, documentation analysis, digital communication analysis, and interpretation of environmental graphic elements used during the event. The findings show that graphic designers actively manage identity systems, visual hierarchy, visitor navigation, environmental communication, and digital branding across physical and digital touchpoints. This study also extends previous research on Towilfiets, particularly on UI/UX design, usability, AI-based dashboard systems, and sustainable tourism communication. The novelty of this study lies in positioning graphic designers not merely as technical visual executors but as strategic actors who manage visual narratives, information structures, and audience interaction within contemporary art events. Therefore, graphic designers play a strategic role in strengthening event branding, improving visitor navigation, and enhancing the cultural value of open-air contemporary art exhibitions.

Keywords: Graphic designer, Design management, Visual identity, Visitor experience, Contemporary art event, Visual communication..

INTRODUCTION

Art Jakarta Gardens 2026 represents an important case for examining the relationship between graphic design, cultural events, and visitor experience. The event was held at Hutan Kota by Plataran, Jakarta, from 5 to 10 May 2026. As an open air art fair, Art Jakarta Gardens 2026 brought together local and Asian galleries, presented artworks in site-specific tents, and placed sculptural works throughout a garden landscape. This format differs from conventional indoor gallery exhibitions because visitors do not only encounter artworks inside a fixed room. They also move through open spaces, temporary structures, signage systems, promotional materials, and digital information channels. In this context, graphic design becomes more than visual decoration. It becomes a strategic communication practice that connects artworks, galleries, visitors, organizers, sponsors, and the physical environment. Graphic designers help visitors understand where they are, what they see, how they move, and how they remember the event. The visual system therefore acts as a bridge between curatorial intention and public experience.

Contemporary exhibition practice shows that visitor experience is shaped by more than the exhibited object itself. Luo, Doucé, and Nys (2024) explain that multisensory museum experience emerges through the interaction between concepts, technology, and visitor perception. Zhang, Zou, Li, Peng, and Jin (2024) also show that sensory experience influences place identity through visual, physical, and emotional dimensions. These studies suggest that cultural events must pay attention not only to content but also to spatial atmosphere, sensory engagement, and communication systems.

Graphic designers play an important role in this process because they organize visual identity, typography, colors, symbols, layouts, signage, maps, social media assets, and environmental graphics into a coherent communication ecosystem. Wheeler (2017) argues that strong visual identity builds recognition and trust through consistency across multiple touchpoints. Calori and Vanden-Eynden (2015) also explain that signage and wayfinding systems help people understand spatial environments and make movement decisions. These ideas are relevant to Art Jakarta Gardens 2026 because the event combines indoor and outdoor presentations within a public urban landscape. This study also builds continuity with previous research on visual communication, UI/UX, and sustainable tourism. Yulianto, Putri, and Khaer (2024) showed that UI/UX prototyping in the Towilfiets digital tourism platform improved information accessibility and user acceptance. Furthermore, Yulianto, Gunawan, and Saptodewo (2026) developed an AI based sustainable tourism dashboard for Towilfiets and showed that Artificial Intelligence and User Interface Design can improve information access, support data-based decision-making, and strengthen community-based tourism management. Both studies demonstrate that visual communication, user interface, usability, and experience design are closely connected. However, those studies mainly focused on digital platforms, dashboards, and tourism interfaces. This present study extends that research trajectory into a physical and environmental context. It examines how similar principles of visual consistency, usability, navigation, and audience experience operate within an open air contemporary art event. Therefore, this study positions graphic designers as strategic actors who manage visual identity, environmental communication, and visitor experience at the same time.

Table 1. Research Focus and Conceptual Direction

Research Focus	Key Concept	Main Contribution
Visual Identity	Typography, color, layout, branding	Builds recognition and consistency
Environmental Graphic	Signage, maps, spatial markers	Supports navigation and orientation

Research Focus	Key Concept	Main Contribution
Design		
Visitor Experience	Sensory, spatial, emotional response	Shapes engagement and memory
Design Management	Strategy, coordination, communication	Positions designers as strategic actors
Research Continuity	Towilfiets UI/UX and AI dashboard	Extends digital interface research into physical exhibition space

Based on this background, this study formulates three research questions. First, how do graphic designers manage visual identity within the ecosystem of Art Jakarta Gardens 2026?. Second, how does graphic design contribute to visitor experience, communication clarity, and environmental navigation throughout the exhibition space?. Third, how has the role of graphic designers shifted from technical visual production toward strategic design management within contemporary art events?

1. LITERATURE REVIEW

1.1 Design Management in Contemporary Cultural Events

Design management refers to the strategic coordination of design activities with organizational goals, communication needs, and audience experience. Best (2015) explains that design management connects creative processes with strategy, implementation, and value creation. In cultural events, design management helps organizers maintain coherence between visual identity, communication materials, spatial design, and visitor services. Within Art Jakarta Gardens 2026, design management becomes important because the event operates across multiple platforms and spaces. Visitors encounter the event through websites, social media posts, tickets, maps, signage, gallery booths, sculpture labels, public programs, and outdoor installations. Each element requires visual consistency so that audiences can recognize the event as one unified experience. Design management also helps graphic designers work collaboratively with curators, event organizers, venue managers, sponsors, media teams, and visitors. This collaborative position changes the role of graphic designers from passive visual executors into active communication managers. In a contemporary cultural event, designers must understand not only visual aesthetics but also audience movement, information hierarchy, accessibility, and brand consistency.

1.2 Visual Identity and Event Branding

Visual identity is a structured system of visual elements that represents the character, values, and positioning of an organization or event. Wheeler (2017) explains that visual identity includes logo systems, typography, color, imagery, and applications across media. In an art fair context, visual identity must support both institutional credibility and visitor accessibility. Visitor experience refers to the emotional, cognitive, social, and spatial responses that emerge during a cultural visit. Falk and Dierking (2018) emphasize that museum experience is shaped by personal, social, and physical contexts. This means that exhibition design, signage, layout, lighting, movement, and information clarity all influence how visitors interpret cultural spaces. Environmental Graphic Design contributes directly to visitor experience because it integrates visual communication with architecture, landscape, and spatial movement. Calori and Vanden-Eynden (2015) define signage and wayfinding as systems that help people understand environments and make decisions. Hardwicke, Brown, and Henk (2024) show that wayfinding interventions in urban parks influence how users

engage with public spaces. Celik (2025) also demonstrates that landmarks, visibility, and spatial cues play important roles in wayfinding within historical urban landscapes. These findings are relevant to Art Jakarta Gardens 2026 because the event takes place in an open public landscape where visitors must navigate tents, outdoor sculptures, public programs, and service areas. Graphic designers therefore need to design visual systems that are readable, accessible, consistent, and sensitive to the outdoor environment.

1.3 Visitor Experience and Environmental Graphic Design

Previous studies by Yulianto et al. (2024) and Yulianto et al. (2026) provide an important foundation for this research. Yulianto et al. (2024) examined UI/UX prototyping for Towilfiets and demonstrated that structured interface design could support sustainable tourism communication. Their study highlights the importance of information accessibility, user comfort, and visual structure in digital tourism platforms. Yulianto et al. (2026) expanded this direction by integrating Artificial Intelligence and User Interface Design into a dashboard for sustainable tourism analysis. Their findings show that AI-based dashboard design can improve information access, user experience, and data based decision making in community-based tourism. This research trajectory shows that visual communication design has moved beyond static media. It now works as an interface, information system, and experience management tool. This present study extends that logic from digital tourism platforms to physical exhibition environments. It asks how graphic designers manage visual identity, navigation, information clarity, and visitor experience in an open-air art event. Therefore, the research connects UI/UX, environmental graphic design, and design management within one broader visual communication framework.

Table 2. Literature Mapping

Author(s)	Main Concept	Relevance to This Study
Best (2015)	Design management	Explains design as strategic coordination
Wheeler (2017)	Visual identity	Supports consistency across touchpoints
Calori & Vanden-Eynden (2015)	Signage and wayfinding	Explains spatial navigation systems
Luo et al. (2024)	Multisensory museum experience	Explains visitor perception and sensory engagement
Gao et al. (2024)	Online and offline museum experience	Connects digital communication with physical experience
Yulianto et al. (2024; 2026)	UI/UX, AI dashboard, tourism communication	Builds research continuity from digital tourism to exhibition experience

2. RESEARCH METHOD

This study uses a qualitative descriptive approach with a single case study method. Yin (2018) explains that case study research is appropriate when researchers investigate contemporary phenomena within real-life contexts. Art Jakarta Gardens 2026 was selected because it represents a contemporary art event that integrates exhibition design, public engagement, environmental graphics, and visual identity within an open-air urban setting. The research object is Art Jakarta Gardens 2026, held at Hutan Kota by Plataran, Jakarta, from 5 to 10 May 2026. The event involved local and Asian galleries, site-specific tents, a sculpture garden, public guided tours, music, performance art, talks, and visitor-oriented programs. These characteristics make

Art Jakarta Gardens 2026 relevant for examining how graphic design supports visual identity and visitor experience in a contemporary open air art event.

Data were collected through visual observation, documentation analysis, and digital communication analysis. Visual observation focused on signage systems, gallery markers, exhibition maps, sculpture information boards, promotional displays, typographic hierarchy, color usage, and environmental graphic applications. Documentation analysis examined official promotional materials, website information, social media assets, exhibition maps, and visual communication materials related to Art Jakarta Gardens 2026. Digital communication analysis focused on how the event presented identity, gallery participation, public programs, visitor guidance, and ticketing information through online platforms. The data were analyzed through thematic interpretation. The analysis identified patterns in visual identity management, environmental graphic design, visitor navigation, digital branding, and the strategic role of graphic designers. The findings were then connected with theories of design management, visual identity, visitor experience, environmental graphic design, and contemporary exhibition design.

Table 3. Research Method Summary

Component	Description
Research Approach	Qualitative descriptive
Research Strategy	Single case study
Case Object	Art Jakarta Gardens 2026
Data Collection	Visual observation, documentation analysis, digital communication analysis
Main Data Focus	Signage, maps, visual identity, digital media, spatial communication
Data Analysis	Thematic interpretation
Analytical Focus	Design management, visual identity, environmental graphics, visitor experience

3. RESULT AND DISCUSSION

3.1 Managing Visual Identity Across Physical and Digital Touchpoints

The findings show that graphic designers at Art Jakarta Gardens 2026 manage visual identity across multiple physical and digital touchpoints. The event identity appears not only in promotional posters or digital announcements but also in the way visitors encounter signs, maps, gallery names, program information, sculpture descriptions, and social media communication. This indicates that visual identity functions as a complete communication system. Graphic designers actively maintain visual coherence by organizing typography, visual hierarchy, colors, layout systems, image treatment, and spatial applications. This role is important because visitors encounter Art Jakarta Gardens 2026 through different moments: before attending the event through digital promotion, during the visit through signage and maps, and after the event through social media documentation.

This finding aligns with Wheeler’s (2017) argument that visual identity creates recognition through repeated and consistent applications. In Art Jakarta Gardens 2026, consistency helps visitors recognize the event as one integrated experience, even though it consists of many galleries, artists, sponsors, programs, and spatial zones. Gao, Li, Liu, and Fang (2024) also explain that digital communication and online feedback can help

cultural institutions improve offline visitor experience. This means that digital communication should not be separated from physical experience. The finding also connects with Yulianto et al. (2026), who emphasized the importance of UI Design in connecting data, information, and user behavior through a sustainable tourism dashboard. Although the Towilfiets dashboard operates in a digital tourism context, the principle remains relevant. Art Jakarta Gardens 2026 also needs visual consistency, usable information structures, and clear navigation systems so that visitors can understand the event more easily. Therefore, graphic designers function as visual identity managers. They do not merely decorate the event. They connect information, space, memory, and brand recognition into one coherent experience.

3.2 Environmental Graphic Design and Spatial Communication

The open-air format of Art Jakarta Gardens 2026 creates specific challenges for environmental communication. Visitors move through outdoor areas, tents, sculpture zones, public facilities, and program spaces. This condition requires visual systems that can guide movement, reduce confusion, and help visitors understand the spatial structure of the event.

Environmental Graphic Design plays an important role in this process. Directional signs, maps, gallery markers, sculpture labels, information boards, and public program signs help visitors make decisions while moving through the site. These visual elements are not secondary decorations. They are part of the visitor's experience infrastructure. Calori and Vanden Eynden (2015) explain that signage and wayfinding systems connect visual communication with spatial behavior. This is visible at Art Jakarta Gardens 2026 because visitors depend on visual cues to locate galleries, sculpture areas, guided tour points, and service facilities. Hardwicke et al. (2024) show that wayfinding interventions in urban parks affect how people engage with public environments. Ko and Chen (2025) also demonstrate that tourism signage location planning can improve visitor movement in historical areas.

Medaković, Đukić, and Jovanović (2024) emphasize that museum spatial layout influences visitor paths and engagement. Although Art Jakarta Gardens is not a museum building, the same principle applies: spatial organization and visual guidance shape how visitors move, stop, observe, and interact. This discussion also expands Yulianto et al. (2024), who found that UI/UX design helps users access tourism information more comfortably through structured interfaces. In Art Jakarta Gardens 2026, environmental graphics serve a similar function in physical space. Signage, maps, and spatial markers become a kind of “offline interface” that helps visitors access information, choose routes, and interact with the exhibition environment.

3.3 Graphic Design and Visitor Experience Formation

Graphic design contributes directly to visitor experience at Art Jakarta Gardens 2026 by making information clearer, movement easier, and cultural interaction more memorable. Visitors do not only evaluate artworks. They also experience the atmosphere, signage, visual rhythm, public programs, digital communication, and overall event identity.

Luo et al. (2024) explain that multisensory museum experience emerges from the interaction between concept, technology, and visitor perception. This insight is relevant to Art Jakarta Gardens 2026 because visitors experience the event through visual, spatial, social, and environmental dimensions. Graphic design supports these dimensions by organizing information and helping visitors connect with the event atmosphere.

Berta, Melese, and Dessie (2025) found that interactive technologies can increase visitor engagement, authenticity, experience, and satisfaction. While Art Jakarta Gardens 2026 is primarily an open-air art fair,

the same visitor-centered logic applies. Visitors need clear access to information, meaningful interaction, and a sense of orientation. Graphic design helps provide these needs through maps, signs, visual identity, and digital communication.

Liu and Sutunyarak (2024) also show that immersive museum technologies influence visitor attitude and satisfaction. Their study reinforces the idea that visitor experience is shaped by how people interact with designed systems. In Art Jakarta Gardens 2026, the designed system includes not only technology but also signage, environmental graphics, spatial identity, and promotional communication. Al Khalifa (2025) further demonstrates that exhibit design influences visitor interaction and behavior in museum settings. This supports the finding that graphic design contributes to how visitors behave within the exhibition environment. Clear visual systems help visitors decide where to go, what to see, how long to stay, and how to understand the event. Therefore, graphic design at Art Jakarta Gardens 2026 operates as an experience-forming practice. It helps visitors feel guided, welcomed, informed, and connected to the event.

3.4 Graphic Designers as Strategic Design Managers

The findings show that the role of graphic designers at Art Jakarta Gardens 2026 has shifted from technical production toward strategic design management. Graphic designers do not only create posters, banners, or digital layouts. They also help manage identity systems, communication hierarchy, spatial information, visitor guidance, and cross-platform consistency. This shift reflects broader changes in contemporary design practice. Best (2015) explains that design management connects design decisions with organizational strategy. In Art Jakarta Gardens 2026, designers must understand the needs of organizers, galleries, artists, sponsors, media, and visitors. They must create a visual system that supports the event’s cultural identity while remaining functional for public use. Petković (2025) highlights the importance of experiential graphic design in public and architectural contexts, especially when visual communication informs, inspires, and guides people within built environments. Ivanov, Ivanova, and Dimitrov (2025) also show that visitor behavior analysis can help museums personalize and improve visitor experiences. Although Art Jakarta Gardens 2026 may not use the same data-driven system, the principle remains relevant: understanding visitor movement and behavior helps designers create better visual communication systems. Hsueh and Hsu (2026) further demonstrate that museum visitor experience can be analyzed through multiple dimensions, including exhibition, atmosphere, emotional experience, intellectual experience, social experience, services, and amenities. These dimensions show that visitor experience is complex and requires coordinated management. Graphic designers contribute to this coordination by making the event more readable, structured, and visually coherent.

This role connects strongly with Yulianto et al. (2026), who showed that AI based dashboard design can support data based decision making and improve user experience. In Art Jakarta Gardens 2026, graphic designers may not only design visible visual assets but also support strategic decisions related to visitor flow, information hierarchy, media communication, and spatial experience. Thus, graphic designers at Art Jakarta Gardens 2026 can be understood as strategic design managers. They manage visual meaning, not merely visual form.

Table 4. Result and Discussion Matrix

Finding Area	Main Observation	Supporting References	Interpretation
Visual Identity	Branding appears across digital and physical touchpoints	Wheeler (2017); Gao et al. (2024)	Graphic designers manage consistency and recognition
Environmenta	Signage and maps support spatial	Calori & Vanden-Eynden (2015);	Visual systems function as

Finding Area	Main Observation	Supporting References	Interpretation
l Graphics	orientation	Hardwicke et al. (2024); Ko & Chen (2025)	offline interfaces
Visitor Experience	Visitors interact with atmosphere, information, and spatial rhythm	Luo et al. (2024); Berta et al. (2025); Liu & Sutunyarak (2024)	Graphic design shapes comfort, interaction, and memory
Strategic Design Management	Designers manage communication hierarchy and audience engagement	Best (2015); Petković (2025); Hsueh & Hsu (2026)	Graphic designers act as strategic cultural communicators
Research Continuity	Towilfiets studies inform usability and visual system logic	Yulianto et al. (2024; 2026)	Digital interface principles extend into physical exhibition space

CONCLUSION

Art Jakarta Gardens 2026 demonstrates that graphic designers play a strategic role in strengthening visual identity and shaping visitor experience within contemporary art exhibition ecosystems. The findings show that graphic designers no longer function only as technical visual producers. They increasingly operate as strategic design managers who coordinate branding systems, environmental communication, visitor navigation, information structures, and audience engagement. Visual identity management across physical and digital touchpoints contributes to communication consistency and audience recognition. Through typography, color systems, layout, signage, maps, gallery markers, digital promotion, and environmental graphics, graphic designers help visitors recognize Art Jakarta Gardens 2026 as one coherent cultural event. Environmental Graphic Design also supports visitor orientation, accessibility, and spatial understanding. In an open air setting such as Hutan Kota by Plataran, graphic design helps transform a complex outdoor environment into a readable and navigable exhibition space. The study also shows that visitor experience is strongly influenced by communication clarity, spatial organization, sensory interaction, and information accessibility. Graphic designers contribute directly to constructing meaningful cultural experiences by helping visitors move, interpret, remember, and emotionally connect with the event.

This research also strengthens the continuity of previous studies by Yulianto et al. (2024) and Yulianto et al. (2026). The earlier Towilfiets studies demonstrated the importance of UI/UX, usability, AI-based dashboards, and sustainable tourism communication in digital environments. This present study extends that contribution into the physical and environmental context of a contemporary art event. It shows that the principles of usability, visual consistency, information clarity, and audience experience are not limited to digital interfaces. They also operate within exhibition spaces, environmental graphics, and cultural events. The novelty of this study lies in positioning graphic designers as strategic actors who manage visual ecosystems within contemporary art events. While previous studies often emphasize curatorial practice, audience participation, or cultural programming, this study highlights the managerial dimension of graphic design in shaping public interaction, environmental communication, and exhibition branding. Therefore, contemporary graphic design should be understood not merely as a visual discipline but as a strategic communication practice capable of integrating identity systems, environmental experiences, and audience engagement within increasingly complex cultural ecosystems.

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CHAPTER 4

The Influence of Sustainable Organizational Culture, Sustainable Competencies, And Sustainable Motivation on the Sustainable Performance of Personnel at Radar Unit 242 Tanjung Warari

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ABSTRACT

Sustainable performance is a strategic factor supporting the success of air defense operations, particularly in units operating radar as a primary weapon system. This study analyzes the influence of Sustainable Organizational Culture (SOC/X1), Sustainable Competencies (SC/X2), and Sustainable Motivation (SM/X3) on the Sustainable Performance (SP/Y) of personnel at Radar Unit 242 Tanjung Warari. The research employs a quantitative approach using a survey method, with a population of 133 personnel and a sample of 100 respondents selected through simple random sampling. Data were collected via questionnaire and analyzed through path analysis (SPSS v.25). All five hypotheses were supported: SOC significantly influences SM ($\beta = 0.788$); SC significantly influences SM ($\beta = 0.415$); SOC significantly influences SP ($\beta = 0.618$); SC significantly influences SP ($\beta = 0.454$); and SM significantly influences SP and serves as a partial mediating variable ($\beta = 0.194$). The model explains 70.4% of variance in personnel sustainable performance ($R^2 = 0.704$). These findings confirm that strengthening sustainable organizational culture, continuously enhancing competencies, and maintaining consistent motivation are key to improving sustainable performance and supporting national air defense readiness.

Keywords: sustainable organizational culture, sustainable competencies, sustainable motivation, sustainable performance, path analysis, TNI AU.

INTRODUCTION

Background

Sustainable Performance in organizations is influenced by sustainable organizational culture, sustainable competencies, and sustainable motivation. These four variables are interrelated in shaping effective, adaptive, and consistent work behavior among individuals in an organization. Sustainable Organizational Culture is an organizational culture that emphasizes values of consistency, discipline, adaptability, and long-term performance sustainability — shaping personnel to have a strong commitment toward core duties, efficiency, and organizational continuity (Schein, 2023).

Sustainable Competencies encompass knowledge, skills, and behaviors that not only support current technical task performance but also prepare individuals to face organizational change and dynamics on an ongoing basis, including technical capability, problem-solving, technology adaptation, and sustainability awareness (Robbins & Judge, 2021). Sustainable Motivation refers to internal and external drives that maintain the consistency of individual work enthusiasm over the long term — ensuring personnel not only strive to achieve short-term targets but also maintain high commitment to organizational continuity (Purnama, 2022).

Radar Unit 242 Tanjung Warari is a front-line air defense unit operating under Sector Command III, responsible for aerial surveillance, early detection, identification, and flight activity reporting in support of the national air defense system. The unit's vision is to be 'a professional, adaptive radar unit ready to sustainably support the national air defense system.' Given its characteristics of demanding high alertness, precision, and continuous technical competency, Radar Unit 242 serves as a highly relevant object for studying sustainability-based human resource management.

Despite the strategic importance of the unit, empirical studies on sustainable organizational performance in military organizations — specifically in the context of radar units with isolated geographical conditions — remain very limited. Existing literature has mainly focused on private-sector or manufacturing organizations. This research addresses that empirical gap by integrating sustainable organizational culture, competencies, and motivation in explaining sustainable performance within a TNI AU context, where unique operational conditions including geographic isolation, high-pressure surveillance duties, and hierarchical culture create distinctive dynamics.

Problem Identification

Key problems identified at Radar Unit 242 include: (1) variability in personnel motivation due to geographic isolation and prolonged operational demands; (2) heterogeneity in competency levels across different ranks and specializations; and (3) the need to understand whether sustainable organizational culture directly drives performance or operates primarily through motivational mechanisms.

Research Objectives

This study aims to analyze: (1) the influence of SOC on Sustainable Motivation; (2) the influence of SC on Sustainable Motivation; (3) the influence of SOC on Sustainable Performance; (4) the influence of SC on Sustainable Performance; and (5) the influence of Sustainable Motivation on Sustainable Performance, including its role as a mediating variable at Radar Unit 242 Tanjung Warari.

THEORETICAL FRAMEWORK, CONCEPTUAL FRAMEWORK & HYPOTHESES

Theoretical Foundations

Sustainable Organizational Culture (SOC) is a set of values, norms, beliefs, collective behaviors, and operational practices oriented toward sustainability, internalized into the vision, mission, policies, and organizational activities, emphasizing commitment, employee involvement, and work systems that support consistent pro-sustainability behavior (Schein, 2023). The theoretical grounding of SOC draws on Schein's organizational culture framework and Robbins & Judge's (2017) organizational behavior model, which places culture as the primary driver of motivational attitudes.

Sustainable Competencies are grounded in Goleman's (2021) emotional intelligence framework and Boyatzis's (2022) competency model, encompassing technical knowledge, problem-solving capabilities, technology adaptation, proactiveness in reducing resource waste, and environmental awareness. These competencies are viewed as linearly supporting performance outcomes.

Sustainable Motivation is theoretically positioned through Luthans's (2002) commitment-as-mediator model, representing long-term commitment, task perseverance, resilience to operational routines, and responsiveness to leadership recognition — all critical in isolated military settings. Motivation operates as a partial mediator bridging structural factors (culture and competencies) to performance outcomes.

Sustainable Performance is defined as the level of work achievement that is efficient, innovative, disciplined, and continuous in supporting mission success, measured through four dimensions: Resource Efficiency, Sustainability of Work Output, Performance Innovation, and Operational Effectiveness. The model draws on stakeholder theory and the resource-based view adapted to military-public sector contexts.

Prior Research

Wahyuni et al. (2023) found significant relationships between organizational culture and performance in public sector organizations. Research by Goleman (2021) confirmed competency as a performance driver through motivational pathways. Luthans (2002) established commitment/motivation as a key performance mediator in hierarchical settings, consistent with military organizations. Boyatzis (2022) validated the competency-performance link across diverse organizational types. These studies collectively support the proposed model but none have been applied to radar unit contexts within the Indonesian Air Force, representing the novelty of this study.

Hypotheses

- H1: Sustainable Organizational Culture has a direct positive and significant effect on Sustainable Motivation of Radar Unit 242 Tanjung Warari personnel.
- H2: Sustainable Competencies have a direct positive and significant effect on Sustainable Motivation of Radar Unit 242 Tanjung Warari personnel.
- H3: Sustainable Organizational Culture has a direct positive and significant effect on Sustainable Performance of Radar Unit 242 Tanjung Warari personnel.
- H4: Sustainable Competencies have a direct positive and significant effect on Sustainable Performance of Radar Unit 242 Tanjung Warari personnel.
- H5: Sustainable Motivation has a direct positive and significant effect on Sustainable Performance and serves as a partial mediating variable in the relationship between X1/X2 and Y.

RESEARCH METHODOLOGY

Research Design & Location

This study employs a quantitative approach with a causal-correlational survey design. The research was conducted at Radar Unit 242 Tanjung Warari (Satuan Radar 242), located in a geographically isolated area in Eastern Indonesia, with data collection conducted in 2025.

Population, Sample & Sampling Technique

The study population comprises all 133 active personnel of Radar Unit 242 Tanjung Warari. Using the Slovin formula at a 5% margin of error, the sample size was calculated as $n = 100$ respondents. Sampling was conducted using simple random sampling to ensure equal opportunity for selection. An additional 30 personnel were used for instrument pre-testing (tryout), totaling 130 participants in the overall data collection process. Respondents ranged from the rank of Private Second Class (Prajurit Dua) to Major, selected to minimize hierarchical response bias.

Research Instrument

Data were collected using a structured questionnaire based on a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The instrument was developed based on the operational definitions and

indicator grids for each variable. All items were pre-tested for validity (Pearson correlation, $r > 0.195$ at $\alpha = 0.05$) and reliability (Cronbach's $\alpha > 0.70$). The final instrument consisted of 96 items (24 per variable) as summarized below:

Table 3.1 Research Instrument Summary

Variable	Role	Dimensions / Indicators	Items	Scale
Sustainable Performance (Y)	Endogenous	Resource Efficiency; Sustainability of Output; Performance Innovation; Operational Effectiveness	24	1–5 Likert
Sustainable Org. Culture (X1)	Exogenous	Vision & Mission Integration; Green Norms; Collective Responsibility; Sustainable Work Practices	24	1–5 Likert
Sustainable Competencies (X2)	Exogenous	Technical Skills; Problem-Solving; Technology Adaptation; Environmental Awareness; Proactivity	24	1–5 Likert
Sustainable Motivation (X3)	Mediating	Long-term Commitment; Task Perseverance; Sense of Meaning; Resilience to Routine	24	1–5 Likert

Data Analysis Method

Data processing followed the stages of editing, coding, and tabulation. Analysis was performed using SPSS v.25 and comprised:

- Classical assumption tests: normality (Kolmogorov-Smirnov; target Sig. > 0.05), homogeneity of variance (Levene's test), and linearity (ANOVA deviation-from-linearity; Sig. > 0.05).
- Descriptive statistics: mean, median, mode, standard deviation, variance, skewness, kurtosis, minimum, and maximum for each construct.
- Path Analysis (Analisis Jalur): regression-based path analysis across two substructures to estimate direct and indirect path coefficients (β), ANOVA model fit (F-statistic), model summary (R^2), and significance of individual predictors (t-statistic).
- Mediation assessment: evaluation of Sustainable Motivation as a partial mediating variable based on significant indirect effects.

RESULTS AND DISCUSSION

Overview of Research Object

Radar Unit 242 Tanjung Warari (Satrad 242) is an operational unit under Sector Command III (Kosek III) of the Indonesian Air Force (TNI AU). Its primary functions include aerial surveillance, early detection, aircraft identification, and real-time data reporting to support command and control operations. The unit's organizational structure consists of the Unit Commander overseeing the Chief of Operations, Chief of Maintenance, Head of Administration, and Head of Internal Affairs.

Satrad 242 operates in a geographically isolated location in Eastern Indonesia, requiring high operational readiness, continuous technical competency, and strong personnel motivation. The unit's vision — 'to be a professional, adaptive radar unit ready to sustainably support the national air defense system' — is operationalized through emphasis on competency development, cultural strengthening, motivational maintenance, and continuous radar equipment upkeep.

Data Collection

Questionnaires were distributed to 100 respondents (active personnel from the rank of Private Second Class to Major) at Satrad 242. All 100 responses were complete and valid; no responses were excluded. Validity testing confirmed that all 96 items ($r > 0.195$; $p < 0.05$) were valid. Reliability testing confirmed excellent internal consistency for all constructs (Cronbach's α ranging from 0.933 to 0.967), as summarized in Table 4.1 below:

Table 4.1 Reliability Statistics Summary

Variable	Items	Cronbach's α	Status
Sustainable Org. Culture (X1)	24	0.964	Reliable
Sustainable Competencies (X2)	24	0.952	Reliable
Sustainable Motivation (X3)	24	0.933	Reliable
Sustainable Performance (Y)	24	0.967	Reliable

Descriptive Statistics

The descriptive statistics for all four research variables based on n = 100 respondents are presented below:

Table 4.2 Descriptive Statistics of Research Variables

Variable	n	Mean	Median	Mode	SD	Min	Max
Sustainable Org. Culture (X1)	100	89.02	91.00	96	7.267	71	102
Sustainable Competencies (X2)	100	85.66	87.00	92	7.845	72	101
Sustainable Motivation (X3)	100	81.16	80.00	77	6.838	68	96
Sustainable Performance (Y)	100	96.74	97.00	98	3.714	86	104

Variable X1 (Sustainable Organizational Culture) showed a mean of 89.02 (SD = 7.267), with median = 91 and mode = 96, indicating a high perception of sustainable culture. X2 (Sustainable Competencies) had a mean of 85.66 (SD = 7.845), reflecting high competency with notable inter-respondent variation (variance = 61.540), consistent with the diverse ranks and specializations in a military unit. X3 (Sustainable Motivation) showed a mean of 81.16 (SD = 6.838), somewhat lower than the culture and competency variables, with a slight positive skew — indicating moderate motivation variability, possibly influenced by the unit's isolated geographic conditions. Y (Sustainable Performance) showed the highest mean (96.74) with the lowest standard deviation (3.714), reflecting consistent high performance and strong standardization of military operational procedures.

Classical Assumption Tests

All classical assumptions were met: (1) Normality — residual Kolmogorov-Smirnov Asymp. Sig. = 0.200 (> 0.05), confirming normal distribution of residuals; (2) Homogeneity of Variance — Levene's test yielded Sig. > 0.05 for all variable pairs (X1→X3: 0.312; X2→X3: 0.406; X1→Y: 0.120; X2→Y: 0.744; X3→Y: 0.194), confirming homogeneous variances; (3) Linearity — ANOVA deviation-from-linearity Sig. > 0.05 for all pairs (X1→X3: 0.076; X2→X3: 0.406; X1→Y: 0.450; X2→Y: 0.136; X3→Y: 0.384), confirming linear relationships. These results validate the appropriateness of path analysis regression.

Path Analysis Results
Model Summary

Table 4.3 Path Analysis Model Summary (Substructures 1 & 2)

Model	Path	R	R ²	Adj. R ²	SEE	Durbin-Watson
Substructure 1	X1, X2 → X3 (Sustainable Motivation)	0.836	0.700	0.693	3.787	2.098
Substructure 2	X1, X2, X3 → Y (Sustainable Performance)	0.839	0.704	0.695	2.051	2.056

Substructure 1 ($X_1, X_2 \rightarrow X_3$): $R^2 = 0.700$, indicating that SOC and SC together explain 70.0% of the variance in Sustainable Motivation. Adjusted $R^2 = 0.693$ confirms model efficiency with no overfitting. Substructure 2 ($X_1, X_2, X_3 \rightarrow Y$): $R^2 = 0.704$, indicating that the three predictors collectively explain 70.4% of the variance in Sustainable Performance. Adjusted $R^2 = 0.695$ further confirms model robustness. Both Durbin-Watson values (~ 2.0) indicate no autocorrelation in residuals.

ANOVA Model Fit

Table 4.4 ANOVA Table for Path Analysis (Substructures 1 & 2)

Model		Sum of Squares	df	Mean Square	F	Sig.
Substructure 1	Regression	3,238.469	2	1,619.235	112.918	<0.001
	Residual	1,390.971	97	14.340		
	Total	4,629.440	99			
Substructure 2	Regression	961.353	3	320.451	76.168	<0.001
	Residual	403.887	96	4.207		
	Total	1,365.240	99			

Substructure 1: $F = 112.918$ ($p < 0.001$), confirming that the combined effect of X_1 and X_2 on X_3 is highly significant. Substructure 2: $F = 76.168$ ($p < 0.001$), confirming that the combined effect of X_1 , X_2 , and X_3 on Y is highly significant. Both models are statistically robust and appropriate for inferential conclusions.

Path Coefficients

Table 4.5 Standardized Path Coefficients (β), t-values, and Significance

Path	β (std.)	t-value	Sig.	Decision
$X_1 \rightarrow X_3$ (Sustainable Motivation)	0.788	14.020	<0.001	Significant
$X_2 \rightarrow X_3$ (Sustainable Motivation)	0.415	7.371	<0.001	Significant
$X_1 \rightarrow Y$ (Sustainable Performance)	0.618	9.628	<0.001	Significant
$X_2 \rightarrow Y$ (Sustainable Performance)	0.454	7.434	<0.001	Significant
$X_3 \rightarrow Y$ (Sustainable Performance)	0.194	2.908	0.005	Significant

In Substructure 1, SOC (X_1) is the dominant predictor of Sustainable Motivation ($\beta = 0.788$, $t = 14.020$, $p < 0.001$), indicating that every one-unit increase in SOC is associated with a 0.788-unit increase in motivation. SC (X_2) also significantly predicts motivation ($\beta = 0.415$, $t = 7.371$, $p < 0.001$), complementing the dominant effect of organizational culture. In Substructure 2, SOC remains the strongest predictor of Sustainable Performance ($\beta = 0.618$, $t = 9.628$, $p < 0.001$), followed by SC ($\beta = 0.454$, $t = 7.434$, $p < 0.001$), and Sustainable Motivation as a partial mediator ($\beta = 0.194$, $t = 2.908$, $p = 0.005$). The significance of X_3 in Substructure 2, while moderate relative to X_1 and X_2 , confirms its role as a significant bridge between structural antecedents and performance outcomes.

Hypothesis Testing Results

Table 4.6 Hypothesis Testing Summary

Hyp.	Path	β	Statistics	Result
H1	SOC → Sustainable Motivation	$\beta = 0.788$	$t = 14.020, p < 0.001$	Supported
H2	SC → Sustainable Motivation	$\beta = 0.415$	$t = 7.371, p < 0.001$	Supported
H3	SOC → Sustainable Performance	$\beta = 0.618$	$t = 9.628, p < 0.001$	Supported
H4	SC → Sustainable Performance	$\beta = 0.454$	$t = 7.434, p < 0.001$	Supported
H5	SM → Sustainable Performance (mediation)	$\beta = 0.194$	$t = 2.908, p = 0.005$	Supported

Discussion

H1 (SOC → Sustainable Motivation, $\beta = 0.788, p < 0.001$) was strongly supported, confirming that sustainable organizational culture — through the internalization of shared sustainability vision, efficiency norms, and collective responsibility — is the dominant driver of personnel motivation at Satrad 242. This is consistent with Robbins & Judge (2017) and the cultural literature suggesting that value alignment between organization and individual generates intrinsic commitment. The finding has strong practical implication: routine socialization of sustainability values through SOPs, leadership modeling, and organizational communication can serve as a durable motivational lever in isolated military settings.

H2 (SC → Sustainable Motivation, $\beta = 0.415, p < 0.001$) was supported, confirming that competencies — particularly technology efficiency knowledge and adaptive skills — reinforce personnel motivation. The moderate but significant coefficient indicates that competency development complements culture as a motivational driver. Training programs focused on radar-specific technology and resource efficiency can amplify this effect. This is consistent with Goleman's (2021) framework linking emotional competencies to sustained commitment.

H3 (SOC → Sustainable Performance, $\beta = 0.618, p < 0.001$) was strongly supported, indicating that sustainable organizational culture is the single most powerful direct predictor of sustainable performance in this study. Consistent behavioral norms, shared beliefs about efficiency, and collective sustainability practices directly generate higher performance outcomes. This aligns with Schein's (2023) model of culture as the foundational layer influencing performance. The implication is that policy revisions embedding sustainability principles in organizational documents and SOPs can directly elevate performance.

H4 (SC → Sustainable Performance, $\beta = 0.454, p < 0.001$) was supported, confirming that personnel competencies in technical skills, problem-solving, and adaptive performance have a strong direct effect on operational outcomes. This is consistent with Boyatzis's (2022) competency-performance model. Targeted workshops on sustainable technology use and radar-specific efficiency training are recommended to maximize this effect.

H5 (SM → Sustainable Performance, $\beta = 0.194, p = 0.005$) was supported, confirming that Sustainable Motivation acts as a positive and significant partial mediating variable. The relatively modest coefficient (compared to X1 and X2) reflects that motivation's role is to bridge structural factors to performance — serving as a psychological conduit rather than a primary driver. This is consistent with Luthans's (2002) commitment-as-mediator model and supports emotional recognition programs and psychological support systems — especially critical given the geographic isolation of Satrad 242 — as performance enhancement tools.

Taken together, the model's overall explanatory power ($R^2 = 0.704$) is very high, confirming that 70.4% of variance in sustainable personnel performance can be explained by the three constructs of culture, competency, and motivation. The remaining 29.6% may be attributable to factors not captured in this model, such as physical equipment condition, inter-unit coordination, leadership style, or individual psychological factors.

CONCLUSIONS, IMPLICATIONS & RECOMMENDATIONS

Conclusions

Based on path analysis (SPSS v.25) with $n = 100$ personnel at Radar Unit 242 Tanjung Warari, the following conclusions are drawn:

- H1 Supported: Sustainable Organizational Culture significantly and positively influences Sustainable Motivation ($\beta = 0.788$, $t = 14.020$, $p < 0.001$). SOC is the dominant motivational driver.
- H2 Supported: Sustainable Competencies significantly and positively influence Sustainable Motivation ($\beta = 0.415$, $t = 7.371$, $p < 0.001$). Competencies complement culture as a motivational antecedent.
- H3 Supported: Sustainable Organizational Culture significantly and positively influences Sustainable Performance ($\beta = 0.618$, $t = 9.628$, $p < 0.001$). SOC is the strongest direct performance predictor.
- H4 Supported: Sustainable Competencies significantly and positively influence Sustainable Performance ($\beta = 0.454$, $t = 7.434$, $p < 0.001$). Technical and adaptive competencies directly drive performance.
- H5 Supported: Sustainable Motivation significantly and positively influences Sustainable Performance ($\beta = 0.194$, $t = 2.908$, $p = 0.005$), serving as a partial mediating variable between culture/competencies and performance.

The overall path model explains 70.4% of variance in Sustainable Performance ($R^2 = 0.704$, Substructure 2), confirming the model's strong predictive validity. All five hypotheses are supported.

Theoretical Implications

This study provides an empirical contribution to human resource management literature in the context of military organizations by validating that path analysis effectively explains relationships among organizational culture, competencies, motivation, and sustainable performance. The finding that Sustainable Motivation operates as a partial mediator enriches conceptual models by positioning motivation as a psychological bridge between structural-cultural factors and operational outcomes. This extends the applicability of Luthans (2002), Schein (2023), Boyatzis (2022), and Goleman (2021) to defense-sector organizations operating in isolated, high-pressure environments. The study contributes to the nascent literature on sustainability-based variables in military HR management.

Practical Recommendations

Based on the findings, five key recommendations are advanced for Radar Unit 242 leadership and TNI AU management:

- Strengthening Sustainable Organizational Culture: Internalize sustainability values into every operational activity through routine socialization, reinforcement of efficient work norms, and leadership modeling. Integrate sustainability principles formally into organizational SOPs and documents to maximize the direct effect on both motivation and performance.
- Enhancing Sustainable Competencies: Implement planned, continuous competency development programs — including technical training, certification, and career development tracks — particularly focused on radar technology and resource efficiency. Adaptive simulation exercises are recommended to expand competency effects on motivation and performance.
- Developing Sustainable Motivation: Implement recognition and reward systems acknowledging personnel performance and dedication. Strengthen internal communication, psychological guidance, and emotional support — particularly given the unit's geographic isolation and prolonged operational demands. Peer-support mechanisms and leadership availability should be formalized.
- Integrated HR Management: Adopt a holistic approach integrating organizational culture, competencies, and motivation across all HR policy decisions. Build a sustainable personnel development system oriented toward long-term performance improvement.
- Regular Performance Evaluation: Conduct periodic and systematic performance monitoring and evaluation against measurable indicators. Evaluations should be objective, transparent, and data-driven — providing the empirical basis for managerial decision-making and resource allocation.

Limitations & Future Research

The study is limited to one radar unit (Satrad 242) with $n = 100$ respondents, restricting generalizability across other TNI AU units. The cross-sectional design prevents causal inference over time. Future research should: (1) replicate the model across multiple radar units for comparative analysis; (2) add potential predictors such as leadership style, organizational support, or physical equipment condition; (3) adopt longitudinal designs to capture culture and competency development dynamics; and (4) explore mixed-methods approaches to qualitatively understand motivational barriers in isolated military settings.

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CHAPTER 5

The Influence of Competence and Work Discipline on Employee Productivity at PT CEN Company, Jakarta

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ABSTRACT

This research aims to analyze: (1) the partial effect of Competence (X1) on employee productivity, (2) the partial effect of Work Discipline (X2) on employee productivity, and (3) analyze the simultaneous effect of Employee Competence and Work Discipline on Employee Productivity (Y) at PT CEN Company, Jakarta. This research used a quantitative method with a sample of 93 respondents obtained through direct distribution of questionnaires to employees. The research data was processed using the SPSS version 25 application with multiple linear regression analysis techniques, and hypothesis testing through t-tests and F-tests.

The results of the study indicate that: (1) the Competence variable partially has a significant effect on employee work productivity with a sig. $0.021 < 0.05$ and a calculated t-value of $2.338 > t\text{-table } 1.990$; (2) The Work Discipline variable was also proven to have a significant effect on work productivity with a sig. $0.020 < 0.05$ and a calculated t-value of $2.354 > t\text{-table } 1.990$; (3) Simultaneously, both variables have a significant influence on employee productivity at PT CEN with a calculated F value of $51.935 > F\text{ table } 2.63$, with a contribution of 50.9%. This finding indicates that increasing competence through relevant training programs, as well as the implementation of consistent work discipline, are important factors in increasing employee productivity.

Keywords: Competence, Work Discipline, Employee Productivity, PT CEN Company

INTRODUCTION

In an era of globalization and increasingly fierce business competition, companies are required to maintain high competitiveness to survive and thrive. One of the determining factors for a company's success is employee productivity. Productivity is measured not only by the quantity of output produced, but also by the efficiency of resource utilization, the quality of work results, and the timeliness of task completion (Ruky, 2013). Companies that are able to maintain high levels of productivity tend to be more competitive, adaptive to market changes, and sustainable in the long term. Productivity is a strategic indicator that reflects the company's overall competitiveness.

Human Resources (HR), as an organization's primary asset, play a central role in achieving company goals. Individual competencies, encompassing knowledge, skills, and work attitudes that meet established standards, are the foundation for work effectiveness (Watson Wyatt Worldwide, 2003; Ruky, 2013). Work discipline, which refers to adherence to rules and procedures, as well as supervision by managers or supervisors, is also a crucial factor in maintaining consistent and high-quality productivity (Rivai, 2013). These three aspects—competence, discipline, and supervision—are key pillars that complement each other in building productivity. Without the integration of these three aspects, optimal productivity will be difficult to achieve.

More specifically, PT CEN faces real challenges in human resource management. The core problem identified is low or stagnant employee productivity, resulting in failure to achieve the expected RKAP targets. This is characterized by unmet output targets, suboptimal work quality, and time inefficiencies. The company's customer base grew from 2021 to 2025. In 2021, the number of customers was recorded at 50. However, from 2022 to 2025, there was a significant decline. In 2022, the number of customers dropped to 46, an 8% decrease. The downward trend continued in 2023 with 40 customers (-13%), then to 34 customers in 2024 (-15%), and reached its lowest point in 2025 with only 28 customers (-18%). This phenomenon can be seen in Table 1 below:

Table 1. Customer Growth in 2021, 2022, 2023, 2024, and 2025
Year Number of Customers Growth (%)

No	Year	Number of Customers	Growth (%)
1	2021	50	
2	2022	46	-8%
3	2023	40	-13%
4	2024	34	-15%
5	2025	28	-18%

Source: Company internal records

The data illustrates a consistent trend of declining customer base year after year. This indicates the need to evaluate the company's strategy for retaining and increasing customer base to prevent further declines in the future. This situation suggests the company needs to conduct a comprehensive evaluation of the factors affecting productivity.

Furthermore, there are issues related to employee competency, namely a mismatch between job demands and the actual capabilities of some employees. This phenomenon is evident in the skills gap, suboptimal productivity, and lack of initiative in carrying out tasks. The competency gap underscores the need for relevant and sustainable competency programs to enable employees to adapt to industry demands.

In terms of work discipline, employee compliance with company rules and procedures remains low. This is demonstrated by high levels of absenteeism and tardiness, violations of Standard Operating Procedures (SOPs), and disorder at work (Rivai, 2013). Weak discipline not only reduces efficiency but also creates a work culture that is permissive of violations. Absence data can be seen in Table 1.2 as follows:

Table 2. Summary of Employee Lateness and Absenteeism 2025

Month	Number of Employees	Late	% Late	Absent Without Explanation	% Absent
Januari	93	11	9.17%	8	6.67%
Februari	93	10	8.33%	6	5.00%
Maret	93	11	9.17%	7	5.83%
April	93	10	8.33%	5	4.17%
Mei	93	11	9.17%	9	7.50%
Juni	93	11	9.17%	8	6.67%
Juli	93	10	8.33%	7	5.83%
Agustus	93	11	9.17%	9	7.50%
September	93	9	7.50%	5	4.17%
Oktober	93	8	6.67%	6	5.00%
November	93	11	9.17%	8	6.67%
Desember	93	10	8.33%	9	7.50%
Total	—	123	—	87	—

Another issue arises in the supervisory aspect, where the effectiveness of the supervisory function by management or supervisors is less than optimal. This is indicated by the infrequent intensity of supervision, minimal constructive feedback, and indecisiveness in enforcing regulations. Weak supervision has the potential to reduce accountability and work quality, so the supervisory function must be directed towards coaching and mentoring.

Furthermore, the education and competency provided to employees are not fully relevant to actual job needs and industry demands. Organizations also face challenges in measuring the effectiveness of competency programs in increasing employee productivity (Ruky, 2013). Competencies must be based on real job needs, not merely formalities, to truly impact productivity.

In terms of competency and remuneration systems, issues arise related to the fairness, transparency, and competitiveness of employee payroll and productivity assessment systems. This has the potential to reduce motivation and work commitment if not managed properly (Watson Wyatt Worldwide, 2003). An unfair remuneration system will weaken employee engagement and decrease loyalty. Furthermore, organizational culture is also a fundamental factor influencing daily work methods and employee engagement levels. An organizational culture that does not fully support a positive, inclusive work environment free from misconduct can hinder the achievement of desired productivity (Ruky, 2013). A healthy organizational culture is the foundation of sustainable productivity because it fosters consistent collective behavior.

Finally, issues related to the reward and punishment system indicate an imbalance in its implementation. This imbalance impacts motivation and work behavior, as rewards for good productivity are not always commensurate with punishments for violations or poor productivity (Rivai, 2013). Rewards and punishments must be applied proportionally to create a sense of fairness and increase work motivation.

Therefore, this study begins with a general understanding of the importance of employee productivity in the era of global competition and then focuses on the specific issues faced by PT CEN. This research is expected to provide empirical and practical contributions to management in designing strategies to improve employee productivity comprehensively and sustainably. Therefore, the author intends to conduct a study entitled: The Influence of Competence and Work Discipline on Employee Productivity at PT CEN, Jakarta.

REVIEW OF LITERATURE

Work Productivity

Work productivity is an important concept in human resource management because it reflects the workforce's ability to produce optimal output. According to Sinungan in Busro (2018:344), work productivity is the ability of an individual or group of people to produce goods and services within a specified timeframe according to a predetermined plan. This definition emphasizes time efficiency and the achievement of work targets.

Hasibuan (Busro, 2018:340) defines productivity as the ratio of output to input. This view is more quantitative because it emphasizes the input-output ratio, but does not yet address aspects of mental attitude and work behavior.

Sedarmayanti (2017, in Busro, 2018:341) emphasizes that productivity is a mental attitude that always seeks improvement, is results-oriented, and strives to increase the quality and quantity of work by optimally utilizing resources. This definition broadens the understanding of productivity not only as a measure of efficiency but also as a reflection of a positive work culture.

Peter Drucker (Busro, 2018:342) states that productivity is the ability of workers to produce more output with the same resources through effective management, innovation, and skill improvement. This view emphasizes the importance of innovation and managerial effectiveness.

Paul Mali (Busro, 2018:343) defines productivity as a measure of efficiency in utilizing resources to produce goods and services, encompassing aspects of quantity, quality, and time.

Definition of Competence

According to Lyle & Signe (Suhadi, 2022:45), competence is an individual's underlying characteristic related to work outcomes. Suparno (Yusuf Taufik et al., 2023:112) states that competence is sufficient skill to perform tasks according to one's abilities.

Edison (Bafaeghi et al., 2023:77) defines competence as an individual's ability to perform work correctly based on knowledge, skills, and attitudes. Spencer (Pratamiaji et al., 2019:134) emphasizes that competence is a fundamental characteristic of a person related to productivity effectiveness.

McClelland (Mafra, 2017:56) states that competence is a fundamental characteristic that predicts superior productivity. Spencer & Spencer (Mustapa & Suhab, 2022:89) categorize competence into motives, traits, self-concept, knowledge, and skills.

Moeherson (Pratamiaji et al., 2019:141) added five dimensions of competency: task skills, task management skills, contingency management skills, job role environment skills, and transfer skills.

Work Discipline

Latainer (Sutrisno, 2019) defines discipline as a force that develops within employees so that they voluntarily conform to organizational rules and values. Davis (Kerja et al., 2020:57) states that discipline is a management action to enforce organizational standards.

Hasibuan (Sondakh et al., 2023:64) defines discipline as a person's awareness and willingness to comply with company regulations and social norms.

Hypothesis Development

Influence Of Competency And Work Discipline On Employee Work Productivity At PT CEN Company, Jakarta The research hypothesis is:

H1: There is an influence of competence (X1) on employee work productivity (Y).

H2: There is an influence of work discipline (X2) on employee work productivity (Y).

H3: There is a simultaneous influence of competence (X1) and work discipline (X2) on employee work productivity (Y).

The research method used was quantitative, using a survey with a causal approach. Regression analysis was used to analyze the influence of one variable on another. This regression analysis requires a significant linear regression relationship between the two variables. However, to calculate the coefficient of each regression, a correlation coefficient for each variable is required. Therefore, to complete the regression coefficient calculation, correlation and regression analysis for each variable must first be performed. This research was conducted by examining or analyzing the influence of one variable on another. The variables to be studied consist of three: (1) Competence (X1) ; (2) Work Discipline (X2) ; (3) Employee Work Productivity (Y).

Examples of research charts or frameworks are as follows:

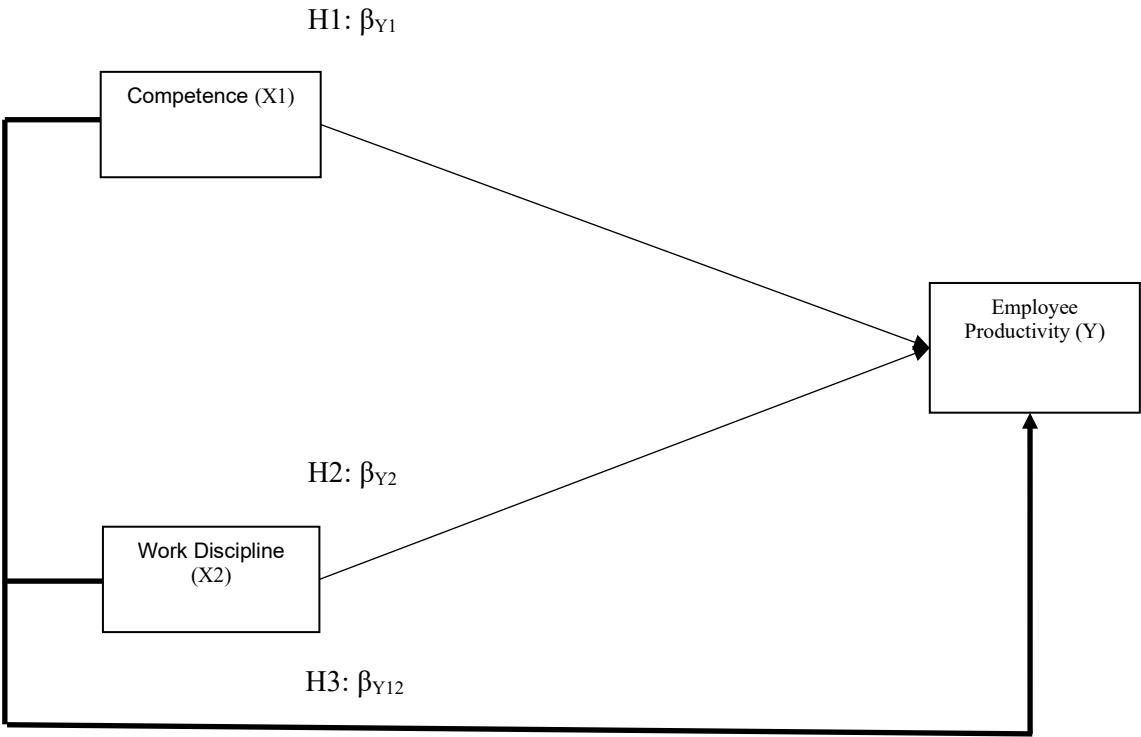


Figure 1. Research Framework

METHODOLOGY

The research method used was quantitative, using a survey with a causal approach. Regression analysis was used to analyze the influence of one variable on another. This regression analysis requires a significant linear regression relationship between the two variables. However, to calculate the coefficient of each regression, a correlation coefficient for each variable is required. Therefore, to complete the regression coefficient calculation, correlation and regression analysis for each variable must first be performed. This research was conducted by examining or analyzing the influence of one variable on another. The variables to be studied consist of three: (1) Competence; (2) Work Discipline; (3) Employee Work Productivity.

This approach starts with data. This data is processed into valuable information for decision making. This is the essence of quantitative analysis (Nalendra et al., 2021). Data collection was carried out by distributing questionnaires which were distributed to PT CEN, Jakarta. PT CEN, Jakarta. Respondents were asked to answer the questions in the questionnaire using a Likert scale.

The Sample of population in this study was 93 from employees of PT CEN using Slovin test. In this research, using simple random sampling. The number of samples for this research was 93 respondents.

FINDINGS

Descriptive analysis includes measures of central tendency such as mean, median, and mode, as well as measures of data dispersion such as range and standard deviation. These results provide an overview of employee perceptions of their level of competence, discipline in carrying out tasks, and achieved work productivity. These findings provide a basis for understanding how competence and work discipline influence employee productivity at PT CEN, while also providing a foundation for developing more effective HR management policies.

Table 3 Summary of Statistical Description of Variables

		Statistics		
		Competence, Work	Discipline	Productivity,
N	Valid	93	93	93
	Missing	0	0	0
Mean		62.80	62.8	62.8
Std. Error of Mean		1.928	1.928	1.928
Median		64.50	64	64
Mode		67 ^a	71	71
Std. Deviation		15.424	15.424	15.424
Variance		237.910	237.91	237.91
Skewness		-.150	-0.93	-0.93
Std. Error of Skewness		.299	0.299	0.299
Kurtosis		-1.177	-1.020	-1.020
Std. Error of Kurtosis		.590	0.59	0.59
Range		68	62	62
Minimum		27	26	26
Maximum		95	88	88
Sum		4019	7536	7536

a. Multiple modes exist. The smallest value is shown

Source: Data processed, 2026

The descriptive analysis results show a data profile for the variables Competence, Work Discipline, and Productivity, with a total of 93 respondents. Overall, the three variables had very similar average scores: 62.80 for Competence and 62.8 for Work Discipline and Productivity. This indicates that the overall achievement levels of these three variables are at a relatively equal level within the research scale.

In terms of central tendency, the median value is slightly above the mean, with the mode showing a dominant value of 67 for Competence and 71 for Work Discipline and Productivity. The data distribution

shows a fairly varied pattern with a standard deviation of 15.424. The variance value of 237.91 indicates a fairly wide range of respondents' scores, reflected in the data range between 62 and 68 points.

A more in-depth analysis of the distribution using skewness and kurtosis indicates that the Competence data tends to be symmetrical, with a skewness value of -0.150. On the other hand, the Work Discipline and Productivity variables have a negative skewness of -0.93, indicating that the data distribution is skewed toward higher scores. Negative kurtosis values for all variables indicate a flattened or platykurtic curve shape. Given the small standard error values for skewness and kurtosis, this data qualifies for further inferential analysis, such as correlation and regression tests, to more comprehensively examine the relationships between variables.

Instrumen Test

1. Validity Test

The r value was determined using the df (degree of freedom) formula, namely $df = n - 2$. Therefore, the df value in this study is $20 - 2 = 18$ with an alpha value of 0.05. This resulted in an r value of 0.361. The results of the validity test can be seen in the following tables:

Table 4 Results of the Validity Test for the Competency Variable (X1)

Statement	r count	r table	Description
P1	.976**	0,361	Valid
P2	.954**	0,361	Valid
P3	.954**	0,361	Valid
P4	.651**	0,361	Valid
P5	.954**	0,361	Valid
P6	.651**	0,361	Valid
P7	.954**	0,361	Valid
P8	.651**	0,361	Valid
P9	.954**	0,361	Valid
P10	.976**	0,361	Valid
P11	.954**	0,361	Valid
P12	.976**	0,361	Valid
P13	.596**	0,361	Valid
P14	.662**	0,361	Valid
P15	0.376	0,361	Drop
P16	.976**	0,361	Valid
P17	.976**	0,361	Valid
P18	.976**	0,361	Valid
P19	.954**	0,361	Valid
P20	.930**	0,361	Valid

Table 1. Results of the Validity Test for the Competency Variable (X1)

Source: Data processed by SPSS, 2026

Based on Table 4, it can be seen that the calculated r for each statement tested is greater than the table r . There is one invalid item, namely item P11. Therefore, it can be concluded that the questionnaire for the Competence variable (X1) tested has a positive value and is declared valid for 19 statements.

Table 5 Results of Validity Test of Work Discipline Variable (X2)

Statement	r count	r table	Description
P1	.985**	0,361	Valid
P2	-0.2396	0,361	Valid
P3	.763**	0,361	Valid
P4	.962**	0,361	Valid
P5	.962**	0,361	Valid
P6	.624**	0,361	Valid
P7	.962**	0,361	Valid
P8	.629**	0,361	Valid
P9	.813**	0,361	Valid
P10	.985**	0,361	Valid
P11	.962**	0,361	Valid
P12	.985**	0,361	Valid
P13	.588**	0,361	Valid
P14	.660**	0,361	Valid
P15	-0.296	0,361	Drop
P16	.985**	0,361	Valid
P17	.985**	0,361	Valid
P18	.985**	0,361	Valid
P19	.962**	0,361	Valid
P20	.932**	0,361	Valid

Source: Data processed by SPSS, 2026

Based on table 5, it can be seen that the calculated r of each statement tested shows that the calculated r is greater than the table r , there are 2 that are invalid, namely items P2 and P15, so it can be concluded that the questionnaire from the Work Discipline variable (X2) tested has a positive value and is declared valid for 18 statement items.

Table 6 Results of the Validity Test of the Productivity Variable (Y)

Statement	r count	r table	Description
P1	.982**	0,361	Valid
P2	.930**	0,361	Valid
P3	.539*	0,361	Valid
P4	.930**	0,361	Valid
P5	.930**	0,361	Valid
P6	.771**	0,361	Valid
P7	.948**	0,361	Valid
P8	.948**	0,361	Valid
P9	.982**	0,361	Valid
P10	0.276	0,361	Drop

Statement	r count	r table	Description
P11	.982**	0,361	Valid
P12	.930**	0,361	Valid
P13	.539*	0,361	Valid
P14	.930**	0,361	Valid
P15	.948**	0,361	Valid
P16	.982**	0,361	Valid
P17	.845**	0,361	Valid
P18	.930**	0,361	Valid
P19	.930**	0,361	Valid
P20	.948**	0,361	Valid

Source: Data processed by SPSS, 2026

Based on Table 6, it can be seen that the calculated r for each tested statement is greater than the table r. One item, item P10, is invalid. Therefore, it can be concluded that the questionnaire for the Productivity (Y) variable tested has a positive value and is valid for all 19 statements.

1. Reliability Test

This test aims to measure a questionnaire as an indicator of a variable or construct. A questionnaire is considered reliable if a person's answers to the statements are consistent or stable over time and has an Alpha value > 0.60 .

Table 7 Reliability Test Results

No	Variable	Cronbach's <i>alpha</i>	Criteria	Description
1	Competency (X1)	0,983	0,60	Reliable
2	Work Discipline (X2)	0,968	0,60	Reliable
3	Productivity (Y)	0,977	0,60	Reliable

Based on the reliability test results, the Cronbach's alpha value for each variable was greater than 0.60. Therefore, the statements from each questionnaire variable can be considered reliable.

1. Normality Test

The normality test aims to determine whether the confounding variables or residuals in the regression model have a normal distribution. Data are considered normally distributed if the Asymp.Sig. (2-Tailed) value is > 0.05 , as seen in Table 8.

Table 8 Normality Test Results
One-Sample Kolmogorov-Smirnov Test

		Competency	Work Discipline	Productivity
N		93	93	93
Normal Parameters ^{a,b}	Mean	62.8	62.8	67.22
	Std. Deviation	15.424	15.424	16.702
Most Extreme Differences	Absolute	.110	.094	.109
	Positive	.099	.094	.086
	Negative	-.110	-.087	-.109
Test Statistic		.110	.094	.109
Asymp. Sig. (2-tailed)		.053 ^c	.200 ^{c,d}	.057 ^c

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Based on the results of the normality test, the Asymp. Sig. (2-tailed) values for the variables Competency, Work Discipline, and Productivity are 0.053, 0.200, and 0.057 respectively. Since all significance values are greater than 0.05, it can be concluded that the data are normally distributed.

2. Linearity Test

The next step in testing the path analysis requirements is to ensure that the variables specified in the research theoretical model demonstrate a linear relationship. To this end, a significance test and a linearity test are required in the regression model, in accordance with the pattern of relationships between variables formulated in the research theoretical framework.

Table 9 Results of the X1-Y Linearity Test
ANOVA Table

				Sum of Squares	df	Mean Square	F	Sig.
PRODUKTIVITAS KOMPETENSI	* Between Groups	(Combined)		16037.454	33	445.485	7.823	.000
		Linearity		14315.064	1	14315.064	251.389	.000
		Deviation from Linearity		1722.390	34	49.211	.864	.661
	Within Groups			1537.483	59	56.944		
	Total			17574.937	93			

Linearity of Productivity (Y) on Competence (X1). After calculating and analyzing the regression equation of Productivity (Y) on Competence (X1), the calculation results obtained Sig.F calculated deviation from linearity = 0.661. Because Sig.F calculated deviation from linearity = 0.661 > 0.05, the regression coefficient is significant, hence the linear relationship.

Table 10 Results of the X2 –Y Linearity Test

ANOVA Table					Sum of Squares	df	Mean Square	F	Sig.
Productivity Discipline	*	Work	Between Groups	(Combined)	15482.154	33	455.357	6.310	.000
				Linearity	14371.631	1	14371.631	199.150	.000
				Deviation from Linearity	1110.523	34	33.652	.466	.982
			Within Groups		2092.783	59	72.165		
			Total		17574.938	93			

Linearity of Productivity (Y) on Work Discipline (X2). After calculating and analyzing the regression equation of Productivity (Y) on Work Discipline (X2), the calculation results obtained F count deviation from linearity = 0.982, because Sig.F count deviation from linearity = 0.982 < 0.05, the regression coefficient is significant, so the relationship is linear.

3. Homogeneity Test (Lavene Test)

The final stage in testing the path analysis requirements is to ensure that the variables defined in the research theoretical model are homogeneous. Therefore, a homogeneity test is necessary to assess the uniformity between the variables formulated in the research theoretical framework.3. Uji Homogenitas (Lavene Test).

Table 11 Test of Homogeneity of Variances

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Y_X1	Based on Mean	.806	1	196	.371
	Based on Median	.816	1	196	.368
	Based on Median and with adjusted df	.816	1	126.000	.368
	Based on trimmed mean	.820	1	196	.367

Based on the SPSS output above, it is known that the significance value of the Productivity variable (Y) based on the variable (X1) = 0.367 > 0.05, meaning that the Productivity variable data (Y) based on the Physical Work Environment variable (X1) has the same or homogeneous variance.

Table 12 Test of Homogeneity of Variances

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Y_X2	Based on Mean	.005	1	196	.945
	Based on Median	.006	1	196	.940
	Based on Median and with adjusted df	.006	1	125.378	.940
	Based on trimmed mean	.005	1	196	.942

Based on the SPSS output above, the significance value for the Productivity (Y) variable based on variable (X2) is $0.942 > 0.05$, meaning that the Productivity (Y) variable based on variable Competence (X2) has the same variance or is homogeneous.

4. Multiple Linear Regression Test

The data processing results yield the following output in Table 13:

Table 13 Results of Multiple Linear Regression Test
Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	VIF
	B	Std. Error	Beta				
1 (Constant)	30.014	4.702			6.382	.000	
Competence,	.341	.060	.361		2.338	.021	1.254
Work Discipline	.381	.077	.398		2.354	.020	1.312

a. Dependent Variable: Produktivity

Based on the results of the multiple linear regression analysis, the constant value is 30.014, the regression coefficient for Competence (X1) is 0.341, and the regression coefficient for Work Discipline (X2) is 0.381. Therefore, the regression equation is:

$$Y = 30.014 + 0.341X1 + 0.381X2$$

a. Constant = 30.014. If the Competence (X1) and Work Discipline (X2) variables have a value of 0, then employee productivity (Y) is 30.014.

b. Competence Coefficient X1: The Competence coefficient is 0.341, indicating that for every one-point increase in Competence score, there is a 0.341, or 34.1%, increase in productivity, assuming the other variables remain constant.

c. Work Discipline Coefficient X2: The Competence coefficient is 0.381, indicating that for every one-point increase in work discipline score, there is a 0.381, or 38.1%, increase in productivity, assuming the other variables remain constant.

7. Hypothesis Testing

The following are the results of data processing for the partial t-test and the simultaneous F-test.

a. t-Test (Partial)

Table 14 Results of the t-Test (Partial)

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.	VIF
	B	Std. Error	Beta				
(Constant)	30.014	4.702			6.382	.000	
Competene	.341	.060	.361		2.338	.021	1.254
Work Discline	.381	.077	.398		2.354	.020	1.312

a. Dependent Variable: Produktivity

- 1) Competence influences employee productivity. From the data above, it can be concluded that the Competence variable has a significant value of $0.021 < 0.05$ and a calculated t-value of $2.338 > t$ -table value of 1.990. Therefore, it is concluded that H1 is accepted, indicating a positive and significant influence between the Competence variable (X1) and employee productivity (Y).
- 2) Work discipline influences employee productivity. From the data above, it can be concluded that the Work Discipline variable has a significant value of $0.020 < 0.05$ and a calculated t-value of $2.354 > t$ -table value of 1.990. Therefore, it is concluded that H2 is accepted, indicating a positive and significant influence between the Work Discipline variable (X2) and employee productivity (Y).

b. F Test (Simultaneous)

The results of the simultaneous test yielded the following output in Table 15:

Table 15 F-Test Results (Simultaneous)

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12216.343	2	4072.114	51.935	.000 ^b
	Residual	11761.222	119	78.408		
	Total	23977.565	93			

- a. Dependent Variable: Produktivity
- b. Predictors: (Constant), Competence, Work Discipline

The results obtained an f-table value of 3.07. Therefore, the calculated f-value of $51.935 > 2.63$ with a significance value of $0.000 < 0.5$ is obtained. Therefore, H3 can be accepted, meaning that the two independent variables have a positive and significant influence on employee productivity at PT CEN at Halim Perdanakusuma Airport, Jakarta.

8. Coefficient of Determination Test

Based on the data processing, the output in Table 16 is as follows: Dari hasil , didapatkan nilai f-Table 3,07.

Table 16 Results of the Determination Coefficient Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.714a	.509	.500	8.855

The table above shows an R-square value of 0.509, or 50.9%. This means that competency and work discipline influence employee productivity by 50.9%. The remaining 49.1% is influenced by other variables not used in this research.

Based on data analysis and statistical calculations in hypothesis testing, it has been proven that the four proposed hypotheses are valid and appropriate. In connection with the results of the hypothesis

verification, the following section will sequentially present several reviews and discussions of the research findings, as follows:

Competence has a direct, positive effect on productivity. The research findings indicate that the first hypothesis is accepted, namely that competency has a direct, positive effect on productivity. This means that employees in a good organization will exhibit competency in their work and consistently strive to improve their performance. The direct contribution of the competency variable to productivity is quite significant. Therefore, to optimize productivity, efforts must be made to improve the competency factor. Employees with high competency tend to have high productivity. Work discipline has a direct, positive effect on productivity. The research findings indicate that the second hypothesis is accepted. Therefore, work discipline has a direct, positive effect on productivity. This means that employees with high work discipline will be able to carry out their duties professionally. Conversely, employees with low work discipline tend to be unprofessional. The direct contribution of work discipline to productivity is the highest compared to the other two variables, and its influence is the greatest. Therefore, to increase and maintain productivity, efforts must be made to improve work discipline. Management's competence and work discipline have a direct, positive, and simultaneous effect on productivity. The research findings indicate that the third hypothesis is accepted. This means that competence and work discipline have a direct, positive and simultaneous effect on productivity. This means that employees with high competence and good work discipline will be able to carry out their duties professionally and achieve good work performance. The direct contribution of work discipline to productivity tends to be higher than that of competence. Therefore, to increase and maintain employee productivity, efforts need to be made to improve work discipline and increase competence.

DISCUSSION

The following is a discussion script numbered according to the order of your arguments:

1. The results of this study indicate that Competence has a significant positive influence on Productivity. Theoretically, competence, which encompasses knowledge, skills, and work attitudes, enables employees to complete tasks more efficiently and effectively (Spencer & Spencer, 1993). This finding aligns with the view that competence is the primary foundation for individuals to achieve established performance standards, so that increased competence directly contributes to higher productivity output (Robbins & Judge, 2017).
2. On the other hand, Work Discipline was also shown to have a positive and significant influence, slightly more dominant than competence. This indicates that employee compliance with rules, norms, and operational procedures is a key driver in maintaining consistent performance (Mangkunegara, 2017). Work discipline creates an orderly work environment, reduces operational obstacles, and ensures that every resource is optimally utilized, ultimately boosting company productivity.
3. When these two variables are combined, the significant simultaneous effect confirms that competence and work discipline are complementary elements. Competence provides employees with the ability to perform, while work discipline provides direction and consistency in the use of those skills. Companies that can improve the quality of their staff's competencies through training while simultaneously strengthening discipline through a consistent management system will achieve far more optimal productivity gains than those that focus solely on one aspect (Mangkunegara, 2017; Robbins & Judge, 2017).

CONCLUSION

The conclusions of this study are as follows:

1. Competence (X1) has a positive and significant partial effect on Productivity (Y) with a coefficient of 0.361 and a calculated t-value of 2.338. This means that the higher the employee's level of competence, the higher the quality of their productivity.
2. Work discipline (X2) has a positive and significant partial effect on Productivity (Y) with a coefficient of 0.398 and a calculated t-value of 2.354. Employees with high work discipline will carry out their tasks professionally, thereby increasing productivity.
3. Simultaneously, competence, competence, and management competence have a positive and significant simultaneous effect on productivity with a calculated F-value of 51.935 and a combined regression coefficient of 0.509.

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CHAPTER 6

Financial Health Analysis of PT HM Sampoerna Tbk Before and After The COVID-19 Pandemic (2017–2025)

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ABSTRACT

Tobacco industry in Indonesia is one of the largest contributors to the state economy in the form of tax payments, local economic contributions, and job creation. Amidst the strengthening of various manufacturing sub-sectors especially post COVID-19 pandemic, the tobacco industry still faces various challenges. As a company with the biggest market capitalization in the Indonesian tobacco industry, this study aims to analyze the financial performance and financial health of PT HM Sampoerna Tbk before and after the COVID-19 pandemic in 2017–2025 period. DuPont Analysis is used to measure the company's financial performance by decomposing Return on Equity (ROE) into Profitability, Operational Efficiency, and Financial Leverage. The study further uses the Altman Z-Score to analyze and show the level of financial health and potential to bankruptcy. The findings show that the declining of the financial performance is driven by the significant decrease in profitability, although the company is still maintained healthy and low likelihood of bankruptcy with Z-score result 5.33 (safe zone, above 2.99). The insights from this study will be beneficial for managers and policy makers to further discuss on the strategy to keep the industry running profitably and sustainable.

Keywords: Tobacco Industry, Financial Performance, Financial Health, Bankruptcy, Altman Z-Score

1. INTRODUCTION

The COVID-19 pandemic, in which social distancing restriction happened during early 2020 until early 2023, had significant implications for firm performance across geographical areas and business sectors. As evidenced by various studies, it had an overall negative impact on consumer goods companies’ performance, including companies in the tobacco industries (Irwansyah, et al., 2023).

Tobacco industry in Indonesia is one of the largest contributors to the state economy in the form of tax payments, local economic contributions, and job creation (Tan & Dorotheo, 2024). Amidst the strengthening of various manufacturing sub-sectors especially post COVID-19 pandemic, the tobacco industry still faces various challenges, especially as one of the highly regulated industry and facing the year-on-year increase of the excise tax (Pramesti & Gravitiani, 2023).

As a company with the biggest market capitalization in the Indonesian tobacco industry, this study aims to analyze the financial performance and financial health of PT HM Sampoerna Tbk (IDX: HMSP). Several studies has been done investigating the financial ratios and especially the impact of the excise tax increase to the company’s performance (Daryanto, Indrasaputra, & Devina, 2021) and stock price (Sagala & Sumirat, 2022), where the period studied is mostly before and during the years of the COVID-19 pandemic (Hasrul, Kurniawan, Sahabuddin, Natsir, & Nurman, 2024).

Further investigation is needed to see longer trend and impact of the COVID-19 to the company’s performance. Hence, this study will compare the company’s financial performance and potential to bankruptcy before and after the COVID-19 pandemic in 2017–2025 period.

2. THEORETICAL FRAMEWORK

2.1. Financial performance

DuPont analysis is a financial framework that breaks down Return on Equity (ROE) into three distinct components: profitability, operational efficiency, and financial leverage. Created by the DuPont Corporation in the 1920s, it helps investors and managers pinpoint exactly why a company's ROE is changing.

The classic 3-step DuPont equation is calculated as:

$$ROE = \text{Net Profit Margin} \times \text{Asset Turnover} \times \text{Equity Multiplier}$$

or

$$ROE = ROA \times \text{Equity Multiplier}$$

where

- Net Profit Margin (NPM) = Net Income / Revenue → *Profitability*
- Asset Turnover (TATO) = Revenue / Avg. Total Assets → *Operational efficiency*
- Equity Multiplier (EM) = Avg. Total Assets / Avg. Equity → *Financial leverage*
- Return on Equity (ROE) = Net Income / Avg. Equity
- Return on Assets (ROA) = Net Income / Avg. Total Assets

A high ROE is generally viewed favorably. However, the DuPont analysis reveals how that high ROE is achieved: if ROE is driven by a high Net Profit Margin or Asset Turnover, it shows strong underlying business fundamentals; and if ROE is driven almost entirely by a massive Equity Multiplier (high debt), the company may be exposing itself to dangerous financial risks.

2.2. Financial distress

E.I. Altman (1968) created the first multivariate bankruptcy prediction model at New York University in the late 1960s. The multivariate approach to failure prediction gained popularity among finance, banking, and credit risk researchers globally following this pioneering work. Altman developed the Altman Z-Score model based on a sample of 66 manufacturing enterprises (Altman E. I., 1968).

Altman's research successfully predicted a company's bankruptcy with 95% accuracy using financial statement data from one year prior. Altman's development of the Z-Score Model, which includes five ratios, was a significant advancement in multiple discriminant analysis (Altman, Iwanicz-Drozowska, Laitinen, & Suvas, 2017).

The final discriminant function estimated by Altman (1968) is as follows for manufacturing companies:

$$Z = (1.2 * X1) + (1.4 * X2) + (3.3 * X3) + (0.6 * X4) + (1.0 * X5)$$

where

- X1 (Liquidity) = Working capital / Total assets
- X2 (Cumulative profit) = Retained earnings / Total assets
- X3 (Operating efficiency) = Earnings before interest and taxes / Total assets
- X4 (Market confidence) = Market value of equity / Book value of total liabilities
- X5 (Asset productivity) = Sales / Total assets
- Z = Overall Index

The levels of financial distress, i.e. likelihood of bankruptcy, based on the Altman Z-score result are as below for manufacturing companies:

- If higher than 2.99. → *Safe zone*, low likelihood
- Between 1.81 and 2.99 → *Grey zone*, moderate risk
- Below 1.81 → *Distress zone*, high likelihood

3. DATA AND METHOD

The data used in this study is obtained from the company’s annual financial statements for the period 2017–2025. DuPont Analysis is used to measure the company’s financial performance by decomposing Return on Equity (ROE) into Profitability, Operational Efficiency, and Financial Leverage. The study further uses the Altman Z-Score to analyze and show the level of financial distress and potential to bankruptcy.

The balance sheet and income statement of the company during the period are shown below in Table 1 and Table 2.

Table 1. Balance sheet for year 2017–2025 (in IDR trillion)

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Current assets	34.2	37.8	41.7	41.1	41.3	41.4	40.1	38.5	36.4
Non-current assets	9.0	8.8	9.2	8.6	11.8	13.4	15.3	15.8	15.2
Total assets	43.1	46.6	50.9	49.7	53.1	54.8	55.3	54.3	51.6
Current liabilities	6.5	8.8	12.7	16.7	22.0	24.5	23.3	23.7	20.6
Non-current liabilities	2.5	2.5	2.5	2.7	1.9	2.1	2.1	2.3	2.6

Total liabilities	9.0	11.2	15.2	19.4	23.9	26.6	25.4	25.9	23.2
Equity	34.1	35.4	35.7	30.2	29.2	28.2	29.9	28.4	28.4
Total liabilities and equity	43.1	46.6	50.9	49.7	53.1	54.8	55.3	54.3	51.6

Source: Compiled from the company annual reports

Table 2. Income statement for year 2017–2025 (in IDR trillion)

	2017	2018	2019	2020	2021	2022	2023	2024	2025
Sales	99.1	106.7	106.1	92.4	98.9	111.2	116.0	117.9	112.2
COGS	(74.9)	(81.3)	(79.9)	(73.7)	(82.1)	(94.1)	(96.7)	(99.3)	(91.6)
Gross profit	24.2	25.5	26.1	18.8	16.8	17.2	19.3	18.5	20.6
Operating expenses	(8.1)	(8.6)	(9.0)	(8.4)	(8.4)	(9.4)	(10.4)	(10.8)	(11.3)
Operating profit	16.1	16.9	17.1	10.4	8.4	7.8	9.0	7.7	9.3
Other income/expenses	0.8	1.1	1.2	0.8	0.8	0.5	1.3	1.0	0.1
EBIT	16.9	18.0	18.3	11.2	9.2	8.3	10.3	8.7	9.4
Income tax	(4.2)	(4.4)	(4.5)	(2.6)	(2.0)	(1.9)	(2.2)	(2.0)	(2.8)
Net profit	12.7	13.5	13.7	8.6	7.1	6.3	8.1	6.6	6.6

Source: Compiled from the company annual reports

To do the comparison and analysis, the data is aggregated into three periods, namely *Before*, *During*, and *After* the COVID-19 pandemic. The period *Before* is from 2017 to 2019, *During* is from 2020 to 2022, and *After* is from 2023 to 2025. Each period contains single numbers of the balance sheet and income statement information by averaging the three years of data.

4. RESULTS AND DISCUSSION

4.1. Financial performance analysis

As shown in Table 3, the company has declining Return on Equity (ROE) after COVID-19 compared to before, i.e. dropped from 38.2% down to 24.7%. The decline is mainly driven by lower profitability, which is Net Profit Margin (NPM) declining from 12.8% to 6.2%. To save the ROE from further drop, the company manages to keep its Assets Turnover (TATO) at similar level and utilizes higher Financial Leverage (EM) from 1.31 to 1.88. It is interesting to note that along the during and after period, the performance are quite similar for all the three ratios.

Looking at the ratios of the DuPont system, the findings are as follows:

- *Net Profit Margin (NPM)*: Sales revenue is increasing. However, the Net Income is declining. This is driven by higher costs year-on-year, both in COGS and Operating Expenses.

- *Asset Turnover (TATO)*: The company maintains similar level of its operating efficiency, although slightly decreases during COVID-19. It needs higher assets as an enabler to bring higher sales revenue.
- *Equity Multiplier (EM)*: The company utilizes financial leverage by both increasing its assets and also decreasing its equity. This means it uses more liabilities (i.e. debt) to fund its operations. The higher debt is coming from its Current Liabilities, which is driven by the increase in the Excise Tax payable.

From these findings, the company faced two main issues. First, its profit margin is getting lower and lower due to higher costs year-on-year. Second, although it can still maintain its operating efficiency, the higher assets for operations is coming from higher liabilities, which can possibly bring more risks ahead in terms of financial distress.

Table 3. DuPont ratios comparison (yearly average)

	Before (2017–2019)	During (2020–2022)	After (2023–2025)
Net Income	13.31	7.35	7.12
Revenue	103.96	100.84	115.35
Net profit margin (NPM)	12.8%	7.4%	6.2%
Revenue	103.96	100.84	115.35
Avg. Total Assets	45.59	51.87	54.26
Total Asset Turnover (TATO)	2.28	1.94	2.13
Avg. Total Assets	45.59	51.87	54.26
Avg. Equity	34.79	30.45	28.83
Equity Multiplier (EM)	1.31	1.71	1.88
Return on Equity (ROE)	38.2%	24.0%	24.7%

Source: Compiled by the authors

4.2. Financial distress analysis

The company is experiencing significantly lower Altman Z-score after the COVID-19 pandemic compared to before, i.e. from 25.55 before, to 6.44 during, and keep decreasing to 5.33 after. All variables are contributing lower scores, except for Asset Productivity. Despite of the low Z-score, it is still higher than the threshold of 2.99 (*safe zone*), hence the financial distress analysis shows that the company is still healthy and have low likelihood to bankruptcy.

The findings of the individual variables are as follows:

- *Liquidity (X1)*: The company manages to have lower working capital, driven by having much higher Current Liabilities. Its Current Assets remains similar, although slightly higher during COVID-19.
- *Cumulative profit (X2)*: Despite of its ability to generate higher Revenue, the company tends to decrease its Retained Earnings, which also in line with the decrease of its profit margin.

- *Operating efficiency (X3)*: The company's EBIT is decreasing, in which explanation is similar with variable X2 above.
- *Market confidence (X4)*: Significant decrease is happening in the Market Value of Equity of HMSP, especially when comparing the before and during period. The decrease is still happening but slowed down in the after period.
- *Asset productivity (X5)*: This variable is similar with Asset Turnover (TATO), where the company manages to maintain it at similar level before and after the COVID-19.

Table 4. Altman's Z-score comparison (yearly average)

	Before (2017–2019)	During (2020–2022)	After (2023–2025)
Working capital	28.57	20.17	15.78
Total assets	46.88	52.52	53.72
Liquidity (X1)	60.9%	38.4%	29.4%
Retained earnings	13.45	7.50	7.15
Total assets	46.88	52.52	53.72
Cumulative profit (X2)	28.7%	14.3%	13.3%
EBIT	16.69	8.84	8.65
Total assets	46.88	52.52	53.72
Operating efficiency (X3)	35.6%	16.8%	16.1%
Market value of equity	408.66	128.34	87.63
Total liabilities	11.83	23.32	24.86
Market confidence (X4)	34.5	5.5	3.5
Sales revenue	103.96	100.84	115.35
Total assets	46.88	52.52	53.72
Asset productivity (X5)	2.2	1.9	2.1
Z-score	25.55	6.44	5.33
	<i>Safe zone</i>	<i>Safe zone</i>	<i>Safe zone</i>

Source: Compiled by the authors

5. CONCLUSION

The findings show that PT HM Sampoerna Tbk is experiencing lower Return on Equity (ROE) year-on-year from 2017 to 2025. The declining of the financial performance is driven by the significant decrease in terms of profitability, where it generates lower profit margin from its sales. The company utilizes higher financial leverage to compensate the lower profitability, which can possibly bring higher risks ahead. However, the company is still maintained in a healthy condition and not likely to go bankrupt in the short term, with the Z-score result of 5.33 (*safe zone*).

The insights from this study will be beneficial for managers and policy makers to further discuss on the strategy to keep the industry running profitably and sustainable. Further study needs to be done to deep dive on profitability assessment, especially on how to develop strategic cost savings initiatives.

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CHAPTER 7

A Critical Review of the Government of Pakistan's Efforts to Establish Sustainable Peace in the State

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ABSTRACT

This paper presents a critical review of the Government of Pakistan's multifaceted efforts to establish sustainable peace within the state. Despite over two decades of counterterrorism operations, legislative reforms, and rehabilitation programs, Pakistan continues to face complex challenges including sectarian violence, political instability, and insurgent movements, particularly in its western and southern peripheries. The study evaluates the efficacy of key state-led initiatives such as the National Action Plan (NAP), the counter-extremism narrative, military operations (e.g., Zarb-e-Azb, Radd-ul-Fasaad), and socio-economic development projects in conflict-affected areas like the former Federally Administered Tribal Areas (FATA). Employing a qualitative analytical framework, the review identifies structural shortcomings: inconsistent policy implementation, selective application of counterterrorism laws, intelligence failures, and inadequate attention to root causes such as poverty, political exclusion, and judicial inefficiency. Furthermore, it examines the tension between securitized approaches and the necessity for civilian governance and human rights protections. While acknowledging measurable gains in reducing large-scale militancy and restoring public order in major cities, the paper argues that sustainable peace remains elusive without institutional reforms addressing corruption, police accountability, and inter-provincial harmony. The review concludes with policy recommendations for transitioning from reactive security responses to a holistic peace-building model that integrates justice, economic opportunity, and community engagement. Ultimately, this critical appraisal contributes to broader debates on state resilience, counterinsurgency ethics, and the prerequisites for long-term stability in fragile security contexts.

Keywords: Sustainable peace, counterterrorism, Pakistan, governance reform, critical security studies

1. Introduction

Pakistan's security environment since the dawn of the twenty-first century has been unusual and unique in terms of a relative dense cocktail of internal and external challenges: a long insurgency on the western frontier, sectarian and ethnic militancy, separatist violence in Balochistan, and periodic urban terrorism in Karachi, Lahore, and Peshawar. The state's role in the post-9/11 regional security order, and especially its status as a frontline country in the United States-led campaign in Afghanistan, has also made the price of the conflict in terms of lives, displacement and institutional stress extremely high for Pakistan. Over the years, successive governments have responded with a changing array of kinetic actions, legislative reform, and rehabilitation programming. But over 20 years later, lasting peace continues to be absent and in recent times, violence has returned, not abated. In this paper the author attempts a critical assessment of the peace and counterterrorism architecture of the Government of Pakistan, especially in the light of National Action Plan 2014, major military operations in the former tribal belt, the merger of FATA with Khyber Pakhtunkhwa in 2018 and socio-economic and governance reforms aimed at consolidating security gains. The review is inherently critical, neither drawing on state security policy as a neutral technical practice, nor on the Pakistani experience alone, but on the relationship between the stated goals and the actual results of Pakistani state security policy, and on the larger scholarly body of work on securitization, counterinsurgency ethics, and state fragility.

2. Conceptual Framework

Sustainable peace, as defined in this review, is defined as more than the lack of large-scale militant violence. In the peace and conflict tradition of positive peace, sustainable peace demands that the root causes of the conflict be addressed – economic marginalisation, lack of political representation, and inadequate and corrupt justice systems – in addition to the immediate cessation of armed violence. This separation is important for the purpose of Pakistan's assessment, given that a negative peace agenda which assesses peace largely by the number of militant bodies and incidences, may get tactical suppression confused with strategic resolution. The other idea that is organizing is securitization – it is an issue that is presented as an existential threat and is therefore not subject to the same norms of politics and law. The post-2014 counterterrorism regime in Pakistan showcases several hallmarks of securitization: the broadened military mandate in the fight against terror, a casus bello of indefinite detention and the shrinking space for dissent as a security threat. This review frequently includes the interplay between securitization and rights-friendly, democratic governance. Another idea that is pertinent to this review is counterinsurgency ethics; the normative question of what restrictions (if any) should be placed on a state's use of force and coercive legal power to counter an internal armed threat. The tenets of classical counterinsurgency doctrine stress that one must gain the support of the affected population as a basis for securing lasting success, meaning that over- or indiscriminate coercion — even in the short run — can be counterproductive in the long run if it increases alienation, which in turn makes recruiting to militant organizations easier. This review takes that prism into account and will contemplate if the overly securitized reactions in Pakistan have been tuned to develop long haul legitimacy with the affected groups or have instead been focused on short-run suppression by sacrificing legitimacy.

3. Methodology

It is a qualitative, desk study critical review. It brings together primary policy documents (the text and monitoring reports of the National Action Plan), government and military communiqués of major operations and secondary academic and policy literature, human rights reporting and journalistic coverage between 2014 and 2026. Multiple sources were triangulated within government, independent research institutes, and

human rights groups to take overall official views on progress and independent and civil-society views into account. No attempt is made to quantify trends of violence in an original manner; if statistics are quoted, then they are based on publications and are attributed accordingly.

4. State-Led Peace-Building and Counterterrorism Initiatives

4.1 The National Action Plan (2014)

On 16 December 2014, a group of gunmen of Tehrik-i-Taliban Pakistan (TTP) attacked the Army Public School in Peshawar, killing over 140 people, most of whom were children. The immediate impetus for the most extensive counterterrorism framework that has been put in place in Pakistan was the attack on the Army Public School in Peshawar on 16 December 2014, killing more than 140, including a large number of children. The outcome was a rare cross-party, cross-sector civil-military consensus which led to the adoption of the National Action Plan (NAP) on 24th December 2014 by the parliament which included the 20-point blueprint. NAP took a combination of kinetic and non-kinetic measures. The strategic front was represented by endorsing the continuation of military operations, the formation of military courts with the power to try suspects of terror, and the adoption of the death penalty in the event of terrorism. The strategic front was represented by endorsing the continuation of the military operations, the formation of military courts with the power to try terrorism suspects, and the adoption of the death penalty in the event of terrorism, after an informal moratorium was lifted. On the non-kinetic side, it demanded action on hate speech, sectarian organizations, and the closure of financing for terrorism, registration of madrassas and their reform, the protection of religious minorities, and rejuvenation of the national coordinator for counterterrorism policy: civilian National Counter Terrorism Authority (NACTA).

There have been mixed reviews about the implementation of NAP. In the 2 years after the plan's adoption, thousands of militants were killed or arrested and a significant drop in high casualty attacks was reported by government authorities, who were consolidated under NACTA. Government authorities, brought together under NACTA, reported thousands of militants killed or arrested and a sharp reduction in high casualty attacks in the 2 years following the adoption of the plan. Independent reviews have, however, revealed that some of its 20 points have progressed much better than others — for instance, points with strong security or military connotations, such as special courts, kinetic operations and financing crackdowns, have moved much faster while points which are politically sensitive have lagged, including those relating to the reform of the governance structures in the Federally Administered Tribal Areas and the problem of madrassa education and its reform. The plan was revised into fourteen points by 2021, acknowledging that some of the initial objectives had not been met, and independent assessments in 2024-25 reported similar challenges to the judicial, socio-economic and reintegration aspects of the plan, including judicial backlogs, the lack of executions despite hundreds of death sentences, and ongoing shortfalls in the socio-economic and reintegration aspects of the plan.

4.2 Military Operations: Zarb-e-Azb, Radd-ul-Fasaad, and Azm-e-Istehkam

The most all-encompassing counterterrorism strategy in Pakistan was triggered by the mass shooting in Army Public School, Peshawar, on 16 December 2014, when over 140 people, the majority of whom were children, were killed by gunmen of the Tehrik-i-Taliban Pakistan (TTP). A rare consensus, within and across parties and civil society, emerged in the wake of this event, resulting in the National Action Plan (NAP) which was adopted by parliament on 24 December 2014, comprising a 20-point roadmap. NAP used kinetic and non-kinetic measures. It has also backed the continuation of military action, military courts to deal with terrorism suspects, and the use of the death penalty in terrorism cases, after a de facto ban. On the non-kinetic side, it demanded a response to hate speech and the abolition of sectarian groups, the curbing of

terrorist financing, registration and reform of the madrassa system, protection for religious minorities and reform of the National Counter Terrorism Authority (NACTA) as the coordinating civilian body for counter terror policy. In June 2014, Operation Zarb-e-Azb was launched against North Waziristan and extended to other parts of the Former Federally Administered Tribal Areas (FATA), Balochistan and Karachi, which was the largest military operation against militant sanctuaries in Pakistan's history. It was succeeded in 2017 by Operation Radd-ul-Fasaad, which took place nationwide and aimed not only to consolidate the victories but also to eradicate remnants of the militants not just in a geographic theatre but throughout the country. Both operations were also resoundingly successful on the tactical front: key militant bastions were raided and the death toll from terrorist attacks dropped drastically from its peak in the early 2010s.

The benefits were, however, reversible: In August 2021, the Taliban returned to Kabul, marking a significant shift in the regional security landscape. TTP fighters regrouped in Afghan sanctuaries, absorbed some number of abandoned US supplied military equipment from the withdrawal of the Americans and restarted their cross-border attacks after they unilaterally broke the ceasefire with Islamabad in November 2022. According to the monitoring reports by the United Nations, the number of attacks by the TTP had gone up from the low hundreds in 2021 to well over a thousand by 2023, while the Independent Pakistani research centres reported that in 2024, there was an additional increase of sixty-six percent in fatalities caused by terrorism related violence as compared to the previous year, thus making 2024 the deadliest year of the past ten years in terms of conflict deaths. In June 2024 the government declared a new counter-insurgency push Azm-e-Istehkam against both TTP and Baloch separatist activities, which itself acknowledges that the earlier one had failed to bring an irreversible peace in the region.

4.3 The FATA–Khyber Pakhtunkhwa Merger and Socio-Economic Development

The Federally Administered Tribal Areas have been merged into Khyber Pakhtunkhwa province through the Twenty-Fifth Constitutional Amendment in May, 2018, in a manner that was not merely symbolic but had a tangible impact on the structure of the state. In a non-kinetic but structurally significant change, the Federally Administered Tribal Areas (FATA) have been merged into Khyber Pakhtunkhwa province in May 2018 through the Twenty-Fifth Constitutional Amendment. The merger abolished the colonial-era Frontier Crimes Regulation of 1901, brought ordinary judicial powers and provincial-style elections to the tribal areas, and introduced twenty-three new seats in the provincial assembly. The reform initiative was presented as a belated remedy for a century of legal and political marginalization and underdevelopment of the tribal belt that had made it easy prey for militant recruitment. But implementation has been lagging behind the reform's dreams. The FATA Reforms Committee had proposed to allocate a dedicated three per cent of the National Finance Commission award to finance a development program for the merged districts for a period of ten years; in line with independent reviews, a significant part of the money committed has not been accounted for in a transparent manner, and there has been no proper disbursement of it. However, despite expectations of improved health, education and policing in the merged districts, many areas are still lacking due to weak local institutions, continued use of informal jirga-based dispute resolution, and persistent gender and administrative gaps which have left large parts of the merged districts without the expected improvements. Before the merger, it was estimated that two thirds of the people of the FATA were living below the poverty line, highlighting the developmental gap the merger was supposed to close.

5. Structural Deficiencies in the State's Approach

5.1 Implementation Gaps and Selective Application of Counterterrorism Law

Many of the criticisms in the independent evaluations of NAP are about the uneven pace of implementation: points that built upon the existing powers of the security apparatus were implemented rapidly, while points

that required difficult political compromises, such as scaling up reform of religious seminaries, addressing hate speech by politically connected groups, and reforming the criminal justice system, were implemented slowly or symbolically at best. Critics also have said that anti-terrorism law has been selectively applied, with journalists, opposition activists, and political dissidents being prosecuted under the same categories of offenses in some cases, as proscribed militant groups have been in others, and that this law sometimes has been used as a tool for political control instead of a narrowly targeted security measure.

5.2 Intelligence Failures and the Resurgence of Militancy

The resurgence of the TTP in the post-2021 period, and the growing violence by Baloch separatist groups, the Baloch Liberation Army, and attacks by the Islamic State-Khorasan Province, have demonstrated the limitations of a strategy of permanent territorial defeat of militant sanctuaries. Analysts cite a number of intelligence and strategic flaws, including an underestimation of how much the return of the Afghan Taliban will allow TTP fighters to take up arms and get supplies from Pakistan's border, inadequate border management of the Durand Line and a civil-military relationship that has sometimes been undermined by domestic political disputes, making the overall response less coherent. The scale of the resurgence (UN monitors estimated that by 2024 several thousand TTP fighters were operating from Afghan territory), indicates that the earlier military successes did not permanently diminish the capacity of militants, but rather temporarily, and that a strategy based on the concept of land clearance and holding did not account for the reconstitution of cross-border sanctuaries.

5.3 Root Causes Left Unaddressed: Poverty, Exclusion, and Judicial Inefficiency

This article examines the root causes that have not been addressed; poverty, exclusion and judicial inefficiency. One key contention of this review is that Pakistan's approach to counterterrorism has been more of a suppression strategy than a strategy for solving the structural problems that fuel militant recruitment. Poverty and underdevelopment in the former tribal areas and part of Baluchistan continues to be a serious issue, while the investment for development has often been inadequate and postponed due to political and financial hurdles despite the military operations and the merger to FATA. Historical marginalization of the tribal people who were previously denied constitutional rights of citizenship under the Frontier Crimes Regulation Act, and still pending cases of Baloch people's grievances regarding the resource distribution and autonomous rights of Baloch peoples continue to create the resentment that fuels recruitment and legitimacy of militant and separatist groups. Adding to these shortcomings is judicial inefficiency. The special anti-terrorism courts established to expedite the prosecution of such cases have not reduced the backlog of cases; thousands of cases relating to terrorism remain pending and the number of death sentences imposed since 2014 is still not commensurate with the number of executions carried out since 2014, which has eroded the deterrent effect the courts are supposed to have. Low conviction rates, intimidation of witnesses and weak forensic and prosecutorial resources lead to the release of those arrested as militancy suspects, resulting in the recurring arrest of the same suspects.

6. Securitization versus Civilian Governance and Human Rights

The current state of military and intelligence control under counterterrorism has been found to have hurt civilian governance and human rights. Extrajudicial detention of people, frequently without them being informed of their location, has been a regular phenomenon in Pakistan's security operations since the early 2000s. Thousands of cases have been documented across the country by human rights groups and the Commission of Inquiry on Enforced Disappearances, in what is a disproportionate impact on Balochistan and more recently, Pashtun activists who are members of the Pashtun Tahafuz Movement. In 2024, official

statistics showed that thousands of missing persons cases were pending before the Commission, many of which were yet to be resolved. The continued expansion of the military court system into civilian affairs, originally set forth in a constitutional amendment in January 2015, and then extended in 2016, has been criticized by various legal and human rights organizations for not following the regular due process protections such as limited appeals to civilian court. The continued use of anti-terrorism courts to prosecute non-terrorism-related political offences (most notably in the mass prosecutions of members of political parties following the violence of 9 May 2023) will further undermine the distinction between counterterrorism and policing of political dissent, potentially further reducing public trust in the very institutions that the state depends on to foster sustainable legitimacy in conflict affected areas. This securitised stance places a structural tension between the peace building goals that the state proclaims. Communities in Balochistan and the former tribal areas that live with the state primarily through military checkpoints, search operations and unresolved disappearances are more likely to not see the state as legitimate providers of justice and services, directly the opposite of what peace-building efforts are supposed to achieve. In this way, "hyper-mentality" can have a negative effect as it can reinforce the alienation that encourages recruitment into militant and separatist movements while reducing their short-term operational efficiency.

7. Measurable Achievements

It is also important to register actual advances in a balanced critical review. Since approximately 2007 and the implementation of Zarb-e-Azb and NAP's adoption, the kind of large-scale urban terrorism that characterized Pakistan's cities between approximately 2007 and 2014 (mass-casualty bombings in markets, mosques and public places) has reduced significantly, and public order has been meaningfully restored in cities including Karachi, where a parallel operation by the paramilitary apparatus was implemented against organized networks of militants and criminals. The institutional steps taken by NACTA and the freezing and prosecution of terrorist financing networks and the building of a relatively effective inter-agency coordination mechanism are real progress in institutions compared to the pre-2014 counterterrorism sector. This FATA merger, which suffered from certain implementation flaws, is nonetheless a significant legal and constitutional milestone in the process of ending over 100 years of colonial era exceptionalism in the administration of the FATA. The central objection to this review is not that the state has failed to do anything, but that it has made tactical and legal gains without structural and root-cause reforms to achieve sustainable rather than episodic peace.

8. Towards a Sustainable Peace-Building Framework: Policy Recommendations

Rebalance resources from purely kinetic operations towards sustained investments in the capacities of police, courts and civil administration in the merged tribal districts and Balochistan, with transparency and independently audited disbursement of committed development funds. Establish civilian oversight of counterterrorism policy, including parliamentary and judicial oversight of military court jurisdiction and practices of detention, to lessen the public and actual sense of unrestrained discretion and reliance by security agencies. Implement a mechanism to address cases of enforced disappearances that is independent and has binding timelines, as recommended by both the Pakistani judiciary and international human rights institutions, on multiple occasions. Improve criminal justice reform—enhance prosecutors' and forensics' ability to be more efficient, expand witness protection programs, and speed up case-management in anti-terrorism courts to restore the deterrent and legitimizing role of formal adjudication and remove the backlog in these courts. Continue a sustained, cross-border supported diplomatic dialogue with Afghanistan on trans-border militant sanctuaries, bearing in mind that the problem of militant sanctuaries and financing is not

going to be addressed by a one-sided military action. Support political inclusion mechanisms for Baloch and Pashtun communities, including real devolution of resource revenue sharing and devolution of provincial autonomy, as a means to mitigate and tackle political-exclusion grievances that fuel separatist and militant recruitment narratives. Ensure that counter-extremism messaging and regulation of the madrassa system is universal and non-discriminatory, rather than focused on some groups and ignored when it comes to groups with a pro-government agenda. All such recommendations are indicative of a new approach towards peacebuilding instead of a securitized approach to threat suppression, in which justice, economic opportunity, and community engagement are seen as integral parts of the national security framework, not add-ons to it.

9. Conclusion

The 20 year-long Pakistan's counterterrorism and peace-building effort has led to real and tangible decline in the scale of militant violence and significant institutional and constitutional changes, including the National Action Plan, successful military operations on organised sanctuary bases and the historic integration of the erstwhile Federally Administered Tribal Areas into mainstream constitutional structures. However, the increasing resurgence of TTP activity, the ongoing Baloch separatist violence, the continued lack of development in conflict-prone regions, unaddressed enforced disappearances, and the criminal justice system which remains slow and under-resourced point to the fact that the root causes of instability have not been effectively resolved. Sustainable peace, rather than simply a temporary ceasefire, must include an approach by the state of a more "governance" orientation, one in which it maintains its security response while also investing in justice, economic inclusion and civilian oversight. If Pakistan does not find a way to do this, it could be caught in a vicious loop of military success and a resurgence of militants as has been its case in recent history.

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Dr. Anurag Agnihotri is an accomplished academician and finance expert with extensive experience in teaching, research, consultancy, and curriculum development. He has been a Finance faculty member at the College of Vocational Studies (CVS), Delhi University, since July 18, 2007. Before this, he served as a Senior Lecturer at the Delhi College of Advanced Studies under GGSIP University from October 15, 2003, to July 17, 2007. Over his illustrious career, he has made significant contributions to academics, research, and professional consultancy, establishing himself as a leader in his field. Dr. Agnihotri has a robust academic portfolio, having authored six books published by prestigious national and international publishers. His scholarly work includes more than 67 research papers indexed in reputed databases such as Scopus, ABDC, and UGC Care listings, showcasing his expertise in finance and related disciplines. Additionally, he has edited five conference proceedings volumes, further contributing to the dissemination of knowledge in his field. Dr. Agnihotri's policy work has been impactful, with two key policy documents—one on the effects of demonetization on Small and Medium Enterprises (SMEs) and another on Overseas Direct Investment—being accepted and appreciated by the Ministry of Finance (Government of India). These contributions reflect his ability to bridge the gap between academia and policy-making, addressing critical financial issues at a national level. As a respected academic, Dr. Agnihotri has chaired sessions, delivered keynote addresses, and acted as a conference chair in numerous academic and professional gatherings. He is an active member of several prestigious professional bodies and serves on their committees, such as Ph.D. CCI Capital and Commodity Market Committee, ASSOCHAM National Council of Internal Audit and Risk Management. Dr. Agnihotri is a sought-after speaker and resource person for academic programs worldwide. He has conducted webinars and lectures at renowned institutions, including Central Michigan University (USA) and other reputed universities in Turkey, Denmark, Nepal, France, Sri Lanka, Brazil, and Australia. Within India, he has been invited to deliver sessions at leading colleges and universities, sharing his expertise on research methods in finance, literature reviews, and curriculum design. Dr. Agnihotri has played a significant role as a resource person in Faculty Development Programs (FDPs), helping faculty across disciplines enhance their research capabilities. He is a resource faculty member for INSET programs under organizations like KVS, CBSE, NCERT, and SERT and holds the distinction of being an Accredited Management Teacher in Finance by the All India Management Association (AIMA). His academic excellence has earned him numerous best research paper awards, underlining the quality and impact of his scholarly contributions. Dr. Agnihotri's expertise extends beyond academia to professional consultancy. He has advised companies on risk management and policy frameworks and prepared internal financial control manuals for several organizations, including IST Limited, Gurgaon Infospace Limited, IST Steel and Power Limited, EDUCIL and many other

companies. He has also conducted Management Development Programs (MDPs) for middle and senior-level managers and acted as a resource person for NSIC and NSDC. At CVS, Dr. Agnihotri mentors student organizations like FIC, ENACTUS, TEB, and Vociferous, fostering entrepreneurial and leadership skills among students. He also initiated an incubation center for TEB, providing a platform for student innovation. As the NSS Program Officer, his efforts were recognized by the Ministry of Women and Child Development for their significant impact. Dr. Agnihotri has successfully guided three Ph.D. scholars to completion and is an active member of Research Degree Committees (RDCs) and Student Advisory Councils (SACs) at various universities. A key contributor to curriculum development, Dr. Agnihotri has played an instrumental role in designing and reviewing syllabi for numerous programs at Delhi University, including MMI (BA Vocational Studies), MMRB (BA Vocational Studies), BMS, BBE, BBS, BFIA (Three-Year Programs), CBCS Syllabus 2019. He is also a member of syllabus committees at other leading universities and institutions across India.

Dr. Anurag Agnihotri's career is marked by significant contributions to teaching, research, consultancy, and academic leadership. With his expertise, he has influenced policy-making, mentored future leaders, and enhanced the academic rigor of finance education. His extensive engagement in both national and international academic circles underscores his dedication to advancing the field of finance and education.

Dr. Anurag Agnihotri
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Edited by
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