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DOI : 10.32734/ee.v9i1.2708
Electronic ISSN : 2654-704X
Print ISSN : 2654-7031

Volume 9 Issue 1 – 2026 TALENTA Conference Series: Energy & Engineering (EE)

EE Conference Series 09 (2026)
TALENTA Conference Series
Available online at https://talentaconfseries.usu.ac.id

Evaluating the Implementation of the SAPA Application on Operational Leaders' Compliance Using the Theory of Planned Behavior (TPB)

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Abstract

Employee observance of corporate rules and operational guidelines is essential to integrity and business sustainability. On 1 August 2024, PalmCo launched SAPA (Sistem Aplikasi Patuh Aturan) to monitor compliance through digital reporting, real-time evaluation, and transparent feedback. This study evaluates the impact of SAPA's implementation on the compliance of operational leaders, grounded in the Theory of Planned Behavior (TPB). Data from 162 respondents were collected via questionnaires and analyzed using Structural Equation Modeling (SEM-PLS). The findings show that attitudes, subjective norms, and perceived behavioral control significantly influence compliance intentions and behaviors. SAPA performance indicators improved over time, though actual outcomes have not yet reached the 100% target. Practical implications include establishing comprehensive SOPs, developing performance dashboards, enhancing user experience, and reinforcing a compliance-based work culture.

Keywords: Employee Compliance; SAPA; Theory of Planned Behavior; Performance Management.

1. Introduction

Employee compliance with corporate rules, operational standards, and internal policies is a critical determinant of organizational integrity and long-term sustainability. In highly regulated and operationally complex industries—such as Indonesia's palm oil sector—compliance ensures not only consistency in daily workflows but also contributes directly to productivity, cost efficiency, and risk mitigation. As a state-owned enterprise under the PalmCo Sub-Holding, PT Perkebunan Nusantara IV (PalmCo) manages more than 639,000 hectares of plantations and operates dozens of mills, kernel plants, nurseries, and supporting units. The company's large-scale operations demand strong supervision systems, accurate reporting mechanisms, and disciplined execution of Standard Operating Procedures (SOPs) and Work Instructions (IK). Compliance is not merely an administrative requirement; it is central to safeguarding operational coherence across geographically dispersed business units with varied technological maturity and workforce composition.

Digital transformation has emerged as a cornerstone of PalmCo's operational reform. Recognizing the limitations of traditional, paper-based monitoring systems—often characterized by incomplete documentation, inconsistent

Selection and peer-review under responsibility of The 2nd International Joint Conference on Digitalisation of Sustainable Social Sciences (IJCDSS) 2025
p-ISSN: 2654-7031, e-ISSN: 2654-704X, DOI: 10.32734/ee.v9i1.2708

reporting, and low visibility for top management—the company initiated several technological innovations to enhance accountability. One of the most strategic initiatives is the launch of the Sistem Aplikasi Patuh Aturan (SAPA), a digital platform introduced on 1 August 2024. SAPA aims to standardize compliance reporting, improve the accuracy of task execution records, and provide a transparent, real-time overview of operational performance in both on-farm and off-farm environments.

Putri (2021) further highlights that conventional payment systems pose inherent risks of fraud, data breaches, and unauthorized access due to inadequate verification controls. In the case of PTPN IV, such risks are compounded by fragmented internal systems and the limited automation of financial validation processes. To address these gaps, this research introduces a novel governance standardization model specifically designed for electronic payment systems within the plantation industry. Unlike previous studies that focus predominantly on the banking or retail sectors (e.g., Setiawan & Hartono, 2020; Wibowo, 2023), this study provides a fresh contribution by developing a framework applicable to large-scale, state-owned agroindustry enterprises with decentralized operational structures. The proposed model is expected to enhance efficiency, strengthen accountability, and minimize financial and cybersecurity risks across PTPN IV's digital payment ecosystem. The rapid expansion of digital financial systems has necessitated the establishment of governance frameworks that ensure security, accountability, and regulatory alignment. However, the diversity of technological infrastructures, institutional policies, and user behaviors has made digital payment governance highly fragmented across organizations (OECD, 2021). Therefore, reviewing key components of standardized digital payment governance is essential to identify the theoretical pillars that can form the foundation of an integrated conceptual framework. Such a framework is not only critical for operational uniformity but also serves as an analytical tool to evaluate organizational readiness, system compliance, and governance maturity (Zhang & Xie, 2022). This literature review, therefore, seeks to synthesize major scholarly perspectives to build a coherent conceptual model applicable to PT Perkebunan Nusantara IV (PTPN IV), a large, multi-unit state-owned enterprise where standardization plays a crucial role in digital transformation.

SAPA was designed to address several operational pain points, particularly in monitoring the daily execution of SOP/IK by operational leaders such as Estate Managers, Mill Managers, Assistant Heads, and Division or Afdeling Assistants. Before SAPA, reporting relied heavily on manual logs, WhatsApp documentation, or delayed reports submitted through hierarchical structures. These fragmented systems hindered real-time supervision and made it difficult for management to validate the authenticity of operational activities. SAPA replaces these traditional methods by enabling digital task lists, photo-verified documentation, automatic recaps, and a dashboard that integrates directly into the company's broader human-resource performance evaluation system (AGHRIS Leaderboard). With automated scoring every 15 minutes and centralized monitoring by Regional Management and Head Office, SAPA was expected to simplify oversight and encourage behavioral discipline through transparency and visibility.

Despite these intentions, early observations reveal that SAPA's implementation has yet to reach optimal performance. Data from August to December 2024 illustrate substantial improvement but still fall short of PalmCo's standard target: 100% compliance in digital task execution and reporting. On-farm units improved from 43.24% to 66.79%, while off-farm units increased from 53.98% to 90.39%, indicating a more responsive adoption in mill operations than in estate operations. Role-specific analysis shows variations across job positions; for example, Afdeling Assistants improved dramatically from 31.0% to 62.8%, while Off-Farm Managers nearly achieved full compliance at 97.1%. These discrepancies reflect differing levels of technological readiness, workload distribution, task complexity, and resource availability across operational layers.

The empirical gap between expected and actual compliance also indicates that technological interventions alone may not guarantee consistent behavioral outcomes. This is where psychological and social mechanisms become relevant. Previous research suggests that employees' willingness to comply with rules and adopt new systems is shaped not only by system usability but also by their attitudes toward the behavior, perceived expectations from their environment, and the perceived level of control they possess when executing the required behavior. Because SAPA demands consistent engagement—daily task review, documentation uploads, and timely reporting—its success

depends not only on system availability but also on how employees internalize compliance behavior as part of their daily routines.

To understand these underlying behavioral factors, this study applies the Theory of Planned Behavior (TPB) developed by Ajzen (1991), which posits that behavioral intention is shaped by attitudes (positive/negative evaluation of the behavior), subjective norms (perceived social pressure), and perceived behavioral control (perception of ease or difficulty in performing the behavior). TPB provides a suitable analytical framework for assessing compliance behavior in digital monitoring contexts, as confirmed by various studies in organizational compliance, technology acceptance, and performance accountability. Previous empirical evidence (Smith et al., 2020; Johnson & Brown, 2021; Maulana, 2020; Anugrah & Fitriandi, 2022; Lee et al., 2023) supports the applicability of TPB in analyzing compliance within systems that monitor employee behavior.

In PalmCo's operational context, attitude reflects how managers perceive SAPA's usefulness—whether they believe the system helps clarify SOP execution, improve transparency, and support performance measurement. Subjective norms refer to managerial expectations, peer influence, and cultural pressure to comply, especially because SAPA scores directly affect recognition programs such as the PalmCo Pin and monthly Leaderboard rankings. Meanwhile, perceived behavioral control relates to employees' confidence in their ability to use SAPA effectively, which includes the availability of internet connectivity, system stability, training adequacy, and the perceived effort required to complete tasks on time.

This study aims to evaluate SAPA's implementation and analyze the extent to which attitude, subjective norms, and perceived behavioral control influence compliance among PalmCo's operational leaders. By combining quantitative SEM-PLS analysis with empirical SAPA usage data, the study provides a comprehensive understanding of the behavioral determinants underpinning digital compliance. The research objectives are threefold: (1) to evaluate the current performance of SAPA across operational units and job levels, (2) to analyze how TPB variables shape compliance behavior, and (3) to formulate managerial recommendations for improving digital compliance systems in agribusiness environments.

The significance of this study is twofold. Theoretically, it expands the application of TPB in digital compliance contexts within plantation management—an environment characterized by dispersed operations and high variability in technological infrastructure. Practically, the study offers actionable insights for improving SAPA's adoption, addressing behavioral barriers, and strengthening a culture of performance accountability. Findings will support PalmCo's broader digital transformation agenda, contribute to the refinement of SOP-based monitoring systems, and guide management in designing interventions that integrate digital tools with behavioral approaches.

Ultimately, this research demonstrates that improving compliance in large-scale agricultural operations requires more than the introduction of monitoring technologies. It necessitates an understanding of how employees perceive the system, how organizational expectations shape their choices, and how structural constraints impact their ability to comply. Through this lens, SAPA becomes not merely a digital reporting tool but a strategic instrument for embedding compliance, transparency, and disciplined execution into PalmCo's operational culture.

2. Material and Methods

This study employed a quantitative research approach to evaluate the implementation of the SAPA application and to analyze the determinants of compliance among operational leaders using the Theory of Planned Behavior (TPB) framework. The methodological design integrates primary survey data and secondary operational data to generate a comprehensive assessment of compliance behavior and system performance in PalmCo's on-farm and off-farm operational environments.

2.1. Research Design

A quantitative, cross-sectional research design was selected as it allows for empirical testing of causal relationships between TPB variables—attitude, subjective norms, and perceived behavioral control—and the compliance behavior of operational leaders. Given the structured nature of SAPA's digital reporting system, the use of numerical data enables precise measurement of construct relationships and supports statistical modeling through

Structural Equation Modeling (SEM) based on Partial Least Squares (PLS). This approach is particularly suitable for studies involving multiple latent variables, predictive behavioral models, and small-to-medium sample sizes.

The selection of SEM-PLS aligns with the exploratory and confirmatory objectives of the study: (1) to validate the measurement model for TPB constructs and (2) to evaluate the structural relationships among the constructs in predicting compliance. SEM-PLS is appropriate due to its ability to handle complex models with reflective indicators, its robustness against data normality issues, and its capacity to generate reliable path coefficients even in non-laboratory field conditions typical of large-scale agribusiness operations.

2.2. Population and Sampling

The target population consisted of 1.160 operational leaders within PalmCo, covering Estate Managers, Mill Managers, Assistant Heads, Afdeling Assistants, Processing Assistants, Technical Assistants, and Quality Control Assistants. These individuals were selected because they hold direct accountability in executing SOP/IK-based operational tasks and are the primary users of the SAPA compliance system.

A purposive sampling technique was used to select the most relevant respondents based on the study's objectives: managers with the highest authority in operational units. Therefore, the sample was narrowed to 162 respondents, comprising 125 Estate Managers and 37 Mill Managers, distributed across PalmCo's seven regional operational areas. This sampling approach ensures that the dataset reflects users with strategic roles, leadership responsibilities, and direct involvement in SAPA reporting and supervision.

The distribution of sampling aligns with the recorded Gladikarya dataset, where Regions I–V represent the largest clusters of plantation and mill operations, while Regions VI and VII operate smaller clusters with fewer leadership positions. The sample is thus reflective of actual workforce composition and organizational structure.

2.3. Data Types and Sources

The study employed two types of data:

2.3.1. Primary Data

Primary data were collected through a structured questionnaire designed using reflective indicators for each construct within the TPB framework. Respondents provided their perceptions and behavioral evaluations using a five-point Likert scale ranging from "Strongly Disagree" (1) to "Strongly Agree" (5).

The questionnaire included:

- 6 indicators for Attitude (X_1)
- 6 indicators for Subjective Norm (X_2)
- 6 indicators for Perceived Behavioral Control (X_3)
- 7 indicators for Compliance (Y)

These indicators were adapted from validated TPB questionnaire structures found in previous empirical studies (Ajzen, 1991; Anugrah & Fitriandi, 2022; Lee et al., 2023)

2.3.2. Secondary Data

Secondary data were sourced from internal SAPA compliance reports from August to December 2024, which include:

- monthly compliance rates,
- job-based compliance scores,
- regional performance variations,
- automatic scoring system outputs from SAPA dashboards.

These data were essential for validating survey responses and triangulating actual compliance behaviors with self-reported perceptions. The integration of secondary data strengthens the analytical depth by linking behavioral constructs to real operational performance patterns.

2.4. Data Collection Procedure

Data collection was conducted between April and June 2025. Prior to distributing the questionnaire, validity and reliability testing were conducted to ensure that all indicators measure intended constructs accurately. The questionnaires were distributed digitally to accommodate managers across dispersed regions, ensuring accessibility for both on-farm and off-farm respondents.

Data collection followed these steps:

a. Preparation of instrument and pilot testing
   A small-scale pilot test with 15 managers ensured clarity, reliability, and contextual suitability.
b. Distribution through secure digital channels
   The survey link was distributed via company communication channels, accompanied by instructions and confidentiality assurance.
c. Data verification and cleaning
   Responses were screened for completeness, consistency, and potential biases.
d. Integration with SAPA compliance data
   After cleaning, primary survey data were merged with secondary SAPA performance reports to contextualize compliance behaviour within actual historical patterns.

2.5. Data Collection Procedure

Data analysis comprised descriptive statistics, measurement model assessment, and structural model evaluation using SmartPLS software.

2.5.1. Descriptive Analysis

Descriptive analysis was used to summarize:

- demographic characteristics,
- distribution of responses,
- indicator means and standard deviations,
- general compliance attitudes and perceptions.

This helped identify early patterns such as role-specific differences between Estate Managers and Mill Managers, age-related variations in adoption patterns, and disparities across regions.

2.5.2. Measurement Model Evaluation (Outer Model)

Three assessments were conducted:

1. Convergent Validity

Validated using:

- factor loadings (>0.70 preferred),
- Average Variance Extracted (AVE > 0.50).

2. Discriminant Validity

Verified through:

- cross-loadings,
- Fornell-Larcker criterion,
- HTMT ratio (<0.85).

These tests confirmed that constructs are distinct and do not overlap conceptually.

3. Reliability Testing

Using:

- Cronbach's Alpha (>0.70),
- Composite Reliability (>0.70).

All constructs demonstrated high reliability, indicating consistent responses across indicators.

2.5.3. Structural Model Evaluation (Inner Model)

To test the hypotheses, the following metrics were examined:

- Path Coefficients (β) to determine the magnitude and direction of influence.
- t-statistics from bootstrapping (5,000 subsamples) to determine significance ($t > 1.96$ at $\alpha = 5\%$).
- p-values to confirm statistical influence ($p < 0.05$).
- Coefficient of Determination (R^2) for compliance behavior.
- Effect size (f^2) for each exogenous variable.
- Predictive relevance (Q^2) reflecting model accuracy and predictive capability.

Results (based on Gladikarya analysis tables) indicate that all three TPB constructs—attitude, subjective norms, and perceived behavioral control—have significant positive influence on compliance.

2.6. Ethical Considerations

All respondents participated voluntarily and were informed of the study's purpose. Data confidentiality was guaranteed, and no personally identifiable information was recorded. Secondary data used were internal company documents shared with formal approval for academic use.

3. Result and Discussion

3.1. Descriptive Findings

3.1.1. SAPA Compliance Trends (August – December 2024)

- On-farm compliance increased from 43.24% to 66.79%.
  Although still below PalmCo's 100% target, the steady progression indicates improved system adoption among plantation personnel.
- Off-farm compliance increased more sharply, from 53.98% to 90.39%.
  Mill operations demonstrated faster digital adoption and higher submission accuracy, reflecting stronger administrative routines and more structured workflows compared to field operations.

These trends suggest that while SAPA effectively strengthens compliance, adoption varies across operational contexts. Field supervision requires extensive mobility and manual observation, making frequent mobile reporting more challenging than in mill settings where leaders operate within fixed facilities.

Table 1. Recapitulation of SAPA Compliance Achievement (August–December 2024)

Period	On Farm (%)	Off Farm (%)
August 2024	43,24	53,98
September 2024	50,12	70,15
Oktober 2024	55,87	80,20
November 2024	60,23	85,10
Desember 2024	66,79	90,39

3.1.2. Compliance by Job Position

Job-level analysis reveals heterogeneous adoption patterns:

- Off-Farm Managers achieved 97.1% compliance, the highest among all roles.
  Their desk-based supervision and established administrative routines contribute to timely SAPA reporting.
- Estate Managers reached 87.5% compliance, indicating strong leadership commitment but also operational challenges inherent in plantation environments.

- Assistant Afdeling roles improved from 31.0% to 62.8%.
  This group showed the most substantial improvement, confirming that targeted socialization and managerial pressure significantly influence behavioral changes.
- Technical and Quality Control Assistants in mills recorded increases from 41–50% up to 87–90%.
  These improvements reflect their routine engagement with monitoring activities.

Overall, SAPA adoption is strongly influenced by job complexity, environmental conditions, and the degree of operational mobility required.

3.2. Distribution of TPB Variables

3.2.1. Attitude (X1)

Descriptive statistics show an overall mean of 4.38, categorized as very good, indicating that operational leaders perceive SAPA as beneficial. Respondents agreed that:

- SAPA aligns with SOP/IK requirements,
- improves documentation accuracy,
- simplifies task monitoring, and
- provides a positive impact on compliance.

However, respondents who selected “less agree” typically expressed concerns regarding connectivity issues, workload pressure, and the perceived administrative burden of uploading evidence.

3.2.2. Subjective Norm (X2)

The overall mean of 4.38 also indicates very strong social influence. Respondents acknowledged that:

- peers encourage SAPA usage,
- supervisors monitor digital compliance regularly,
- management expectations are clearly communicated.

Still, a minority of respondents noted that leadership involvement varies across units, and some regions lack consistent enforcement, reducing the sense of obligation.

3.2.3. Perceived Behavioral Control (X3)

The variable recorded a mean of 4.38, reflecting a strong perception of self-efficacy regarding SAPA usage. Respondents generally agreed that:

- they can operate the application effectively,
- technical guidance is adequate,
- obstacles are manageable.

Yet “less agree” responses highlight challenges such as limited mobile connectivity, insufficient device capability, and demands for additional training.

3.2.4. Compliance (Y)

Compliance recorded an overall mean of 4.41, indicating high behavioral performance and strong alignment with SAPA’s expectations. Respondents consistently agreed that :

- they comply with SOP/IK through SAPA,
- they aim for 100% SAPA completion,
- they meet reporting deadlines,
- they strive to maintain “Pin Hijau” (green pin) performance categories.

Lower scores in some items reflect practical challenges such as workload competition, difficulty uploading photos in remote plantation areas, and occasional system downtime.

3.3. Measurement Model Evaluation (SEM-PLS Outer Model)

- Loading factors for all indicators exceeded 0.70, confirming strong indicator reliability.
- Average Variance Extracted (AVE) for all constructs exceeded 0.50, indicating sufficient convergent validity.
- Composite Reliability and Cronbach's Alpha values were above 0.70, verifying the internal consistency of constructs.
- Fornell-Larcker, Cross-Loadings, and HTMT criteria confirmed discriminant validity.

These results validate that the TPB constructs were measured reliably in PalmCo's digital compliance context.

3.4. Structural Model Evaluation (SEM-PLS Inner Model)

The structural model demonstrates strong predictive capacity for compliance behavior:

- R^2 for Compliance (Y) indicated that attitudes, subjective norms, and perceived behavioral control collectively explain a substantial proportion of compliance variance.
  This aligns with Ajzen's (1991) assertion that intention—and therefore behavior—is shaped by these three constructs.
- Path Coefficients and Significance Tests, Bootstrapping results with 5,000 subsamples showed:
  - Attitude → Compliance: Significant positive effect
  - Subjective Norm → Compliance: Significant positive effect
  - Perceived Behavioral Control → Compliance: Significant positive effect

  All t-values exceeded 1.96, and p-values were below 0.05.
  Thus, all hypotheses (H1, H2, H3) are supported.

3.5. Discussion

3.5.1. Influence of Attitude on Compliance

The strong positive effect of attitude indicates that operational leaders comply more consistently when they believe SAPA:

- enhances efficiency,
- improves transparency,
- benefits unit performance, and
- supports fair evaluation.

This resonates with findings from Smith et al. (2020) and Maulana (2020), who found that digital task reporting enhances adherence to organizational procedures. Managers with positive technological perceptions show stronger compliance motivation.

In PalmCo, positive attitudes are reinforced by SAPA's dashboard visibility, which ties compliance scores to employee recognition, thereby strengthening behavioral reinforcement.

3.5.2. Influence of Subjective Norm on Compliance

Subjective norms emerged as a powerful predictor. Compliance is significantly shaped by:

- direct expectations from Regional Management,
- peer accountability within operational teams,
- company-wide performance culture centered on transparency.

The visibility of leaderboard rankings creates both competitive and collaborative pressure to maintain high SAPA scores. This dynamic aligns with Johnson & Brown (2021), who found that monitoring technologies reinforce accountability when organizational norms support compliance.

The distribution of social influence varies across regions, explaining why some operational units achieve faster compliance gains.

3.5.3. Influence of Perceived Behavioral Control on Compliance

Perceived behavioral control is particularly relevant given PalmCo's challenging operational terrain. The findings confirm that leaders comply when they feel capable of:

- accessing reliable connectivity,
- navigating the application easily,
- overcoming technical barriers.

These results are consistent with Anugrah & Fitriandi (2022), who demonstrated that digital compliance rises when employees perceive fewer obstacles in system usage.

PalmCo's investment in training, updated SOPs, and technical support plays a crucial role in fostering this sense of control.

3.5.4. Integration of Results Within SAPA's Operational System

The combination of TPB findings and SAPA compliance trends leads to several insights:

1. SAPA is technically effective but behaviourally dependent.
   Digitalization alone does not guarantee compliance; behavioral constructs significantly influence outcomes.
2. On-farm compliance grows slower due to environmental constraints.
   Field operations face connectivity gaps, unpredictable conditions, and heavier manual workloads.
3. Off-farm units benefit from structured workflows.
   Mills inherently operate with standardized documentation routines, enabling faster SAPA adoption.
4. Managerial reinforcement is crucial.
   Units with active supervision—especially in Regions I–III—achieved faster gains.
5. Recognition mechanisms drive motivation.
   The "Pin PalmCo" and leaderboard systems create strong motivational levers that intensify subjective norms.

3.6. Implications of Findings

Managerial Implications

- Reinforcing SOP-linked SAPA protocols will reduce ambiguity and enhance consistency.
- Improved infrastructure—especially connectivity—can significantly elevate on-farm compliance.
- Regional managers should adopt targeted coaching for underperforming units.

Operational Implications

- Automation of certain SAPA documentation steps (e.g., batch photo upload) could reduce workload.
- Refining task lists to better reflect field realities may reduce reporting fatigue.

Behavioral Implications

- Strengthening compliance culture requires combining digital enforcement with:
  - consistent supervision,
  - peer accountability,
  - positive reinforcement.

Theoretical Implications

The study expands TPB's empirical relevance by demonstrating its predictive strength in a digital compliance context within a large agribusiness corporation.

3.7. Discussion

The results corroborate that technology-enabled monitoring such as SAPA can enhance compliance, but outcomes remain contingent on psychological and social mechanisms. Managerial support, peer expectations, and perceived ease of using the application shape compliance intentions and behaviours. Given the heterogeneous improvements across roles, targeted interventions are recommended:

1. Policy and SOP reinforcement: Codify end-to-end SOPs to reduce ambiguity and ensure consistent expectations.
2. System usability: Improve SAPA's user interface and workflow to lower effort expectancy and increase adoption.
3. Performance visibility: Provide KPI dashboards for leaders and HR to enable timely feedback and corrective action.
4. Cultural levers: Embed compliance values in leadership routines (coaching, recognition, and consequence management) to strengthen subjective norms and perceived behavioural control.

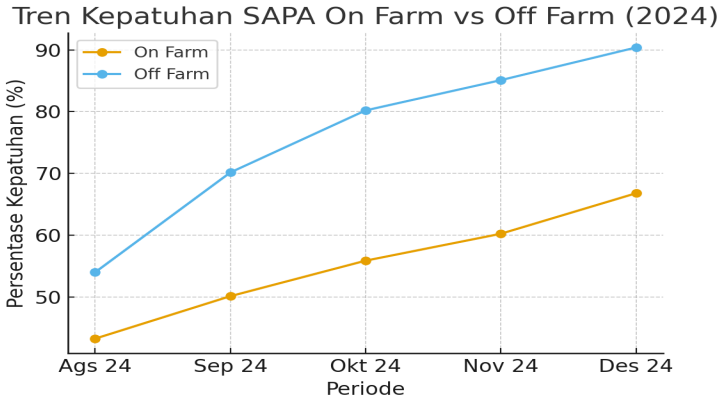

Figure 1. Trend of SAPA compliance (on-farm vs. off-farm), Aug–Dec 2024.

4. Conclusion & Recommendations

4.1. Conclusion

This study set out to evaluate the implementation of the SAPA application and to analyze the behavioral determinants of compliance among operational leaders within PalmCo using the Theory of Planned Behavior (TPB). Through a systematic integration of quantitative SEM-PLS analysis, descriptive data evaluation, and triangulation with SAPA's operational performance, several important conclusions emerge.

First, the implementation of the SAPA system has demonstrated a strong positive influence on the improvement of operational compliance across both on-farm and off-farm units. Although compliance rates have not yet fully reached the organizational target of 100%, the upward trend between August and December 2024 indicates that SAPA is functioning as an effective digital monitoring tool. Off-farm units—such as mills—show substantially higher adoption levels compared to on-farm plantation units, which face environmental and infrastructural challenges that impact consistent digital reporting.

Second, the empirical findings confirm that compliance behavior is significantly shaped by psychological and social determinants, precisely as articulated in the TPB framework. Attitude toward SAPA emerged as a strong predictor of compliance. When operational leaders perceive SAPA as useful, accurate, and beneficial for performance monitoring, their likelihood of adhering to SOP/IK reporting increases. Positive evaluations of SAPA's task-list clarity, photo-verification features, and real-time scoring contribute to greater behavioral intention to comply.

Likewise, subjective norms play a crucial role in reinforcing compliance, particularly in an organizational culture where performance visibility and peer comparisons are embedded in daily practices. Expectations from Regional Management, encouragement from colleagues, and the influence of recognition mechanisms (such as the PalmCo performance pin and digital leaderboard rankings) intensify the sense of obligation to comply. Units with stronger leadership engagement and peer accountability displayed faster and more consistent adoption of SAPA.

Additionally, perceived behavioral control also significantly influences compliance outcomes. Operational leaders who feel confident in their ability to navigate the SAPA system, supported by adequate training, user guidance, and technical assistance, demonstrate higher levels of compliance. Conversely, constraints such as unstable connectivity, device limitations, and heavy field workloads can weaken perceived control and consequently reduce reporting consistency.

In summary, SAPA's effectiveness cannot be attributed solely to technological implementation. Instead, the outcomes reflect an interplay of system design, environmental conditions, organizational culture, and user psychology. To achieve full optimization, PalmCo must continue strengthening all supporting mechanisms—technical, managerial, behavioral, and infrastructural—to ensure SAPA's sustained impact on operational excellence. The findings reinforce that digital transformation in agricultural and industrial sectors must be complemented by behavioral insights to drive meaningful and lasting improvements.

4.2. Recommendations

Based on the findings, several strategic recommendations can be proposed to enhance SAPA implementation and strengthen compliance behavior among operational leaders.

1. Strengthening SOP and Process Standardization
   PalmCo should refine and further standardize the SOP/IK integration within SAPA to ensure that the task lists fully reflect operational realities. Clearer guidelines, better alignment between field activities and digital checkpoints, and periodic SOP revisions will help reduce ambiguity and enhance reporting accuracy.
2. Enhancing Infrastructure and Technical Support
   Connectivity limitations remain one of the main challenges for on-farm compliance. Expanding internet access points, improving network stability, and ensuring device compatibility across all regions will significantly increase perceived behavioral control. Additionally, establishing rapid-response technical support teams will help address application issues in a timely manner.
3. Improving SAPA System Usability
   Although SAPA is generally perceived positively, some users report difficulties with the reporting process, especially during high-workload periods. Enhancing SAPA's user interface, simplifying the process of photo uploads, enabling batch submissions, and optimizing offline mode functionality will reduce reporting fatigue and improve consistency.
4. Strengthening Leadership Involvement and Social Reinforcement
   Subjective norms emerged as a major driver of compliance. Therefore, leadership involvement must be strengthened. Regional Heads and SEVPs should intensify coaching, set clear expectations, and monitor compliance progress regularly. Recognition programs such as the PalmCo performance pin should be expanded to create stronger positive reinforcement.
5. Targeted Behavioral Interventions for Low-Compliance Groups
   Assistant Afdeling roles and certain field-based positions require tailored interventions due to their comparatively lower compliance rates. Targeted training, simplified task lists, real-time mentoring, and reward mechanisms for significant improvement should be implemented.
6. Integrating SAPA with Performance Management Systems
   Since SAPA data feeds directly into AGHRIS Leaderboard scoring, PalmCo should continuously refine the integration to ensure fairness, transparency, and accuracy. This will not only strengthen compliance motivation but also reinforce SAPA as a credible source of performance evaluation.

7. Continuous Monitoring and Impact Evaluation
   PalmCo should adopt a continuous improvement cycle by evaluating SAPA's performance quarterly. Collecting user feedback, conducting system audits, and analyzing compliance data will support evidence-based decision-making and long-term optimization.

4.3. Closing Remark

The findings of this study reaffirm that digital compliance systems such as SAPA can significantly enhance operational discipline, transparency, and organizational performance when implemented alongside strong behavioral and managerial strategies. By understanding the psychological determinants that shape compliance, PalmCo is better positioned to implement targeted interventions that ensure SAPA becomes not only a monitoring tool, but a catalyst for cultivating a high-performance and compliance-driven organizational culture.

Acknowledgments

The author gratefully acknowledges PalmCo for research data access, all respondents for their participation, and the supervisors at Universitas Sumatera Utara for their guidance and feedback.

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