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Research Article

The Influence of Resource Management, Time Management, and Self-Efficacy on Field Engineer Efficiency in Field Service Industry

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Abstract: This study explores the key determinants of field engineer efficiency in the field service industry by analyzing the impact of self-efficacy, resource management, and time management on operational performance. Employing a quantitative research approach, data were collected using saturated sampling from 102 field engineers and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The measurement model showed robust psychometric properties, satisfying the thresholds for convergent validity, discriminant validity, and internal consistency reliability. The structural model results indicate that all three independent variables significantly influence field engineer efficiency. Self-efficacy was found to have the strongest effect ($\beta = 0.421$, $p < 0.001$), followed by resource management ($\beta = 0.347$, $p < 0.001$) and time management ($\beta = 0.289$, $p < 0.001$). The model accounts for 68.7% of the variance in field engineer efficiency, reflecting strong explanatory power and predictive accuracy. Among these variables, self-efficacy emerged as the most dominant factor, suggesting that field engineers' belief in their ability to perform tasks is a critical driver of operational success. High self-efficacy enhances motivation, resilience, and effective problem-solving under pressure, making it essential in dynamic and unpredictable field environments. Resource and time management also play crucial roles in supporting engineers' ability to complete tasks efficiently by ensuring optimal allocation of tools, equipment, and time. The findings provide practical implications for field service organizations aiming to improve workforce performance. Investing in training programs that strengthen self-efficacy, combined with systematic improvements in resource and time management practices, can significantly enhance operational outcomes. By prioritizing these factors, organizations can boost engineer efficiency, reduce operational costs, and improve service delivery, ultimately gaining a stronger competitive advantage in the industry.

Keywords: Field Engineer Efficiency, Field Service Industry, Resource Management, Self-Efficacy, Time Management

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1. Introduction

The field service industry stands as a critical pillar of modern business operations, where skilled technicians are deployed to maintain, repair, and service equipment at client locations. In this demanding environment, field engineers represent the frontline professionals who must navigate complex technical challenges while managing competing priorities and tight deadlines. Their ability to deliver quality service efficiently directly impacts customer satisfaction, operational costs, and organizational profitability. As the industry continues to evolve with technological advancements and increasing customer expectations, understanding the factors that influence field engineer performance becomes increasingly vital for organizational success.

Current research indicates that field engineer efficiency is influenced by a complex interplay of personal capabilities, resource availability, and time management practices. Self-efficacy, defined as an individual's belief in their capacity to execute behaviors necessary to produce specific performance attainments, has emerged as a crucial psychological factor affecting professional performance across various domains. In the engineering context, self-efficacy influences how professionals approach challenges, persist through difficulties, and ultimately achieve their objectives. Simultaneously, resource management is the systematic process of planning, allocating, and managing both human and non-human resources effectively. Time management is the coordination of tasks and activities to maximize effectiveness serve as fundamental operational competencies that directly impact field service delivery quality and efficiency. This research seeks to examine how these three critical factors interact to influence field engineer efficiency in the dynamic field service industry environment.

2. Literature Review

Field Service Management (FSM) has evolved into a complex ecosystem requiring effective coordination of resources, time, and personnel to meet increasing customer demands and Service Level Agreements (SLAs). The field service industry in Indonesia has undergone significant transformation driven by rapid technological advancement, industrial expansion, and evolving customer expectations. This sector encompasses various industries including telecommunications, energy, manufacturing, and infrastructure, where field engineers play critical roles in installation, maintenance, troubleshooting, and customer service operations. As Indonesia continues its digital transformation journey, the demand for skilled field engineers has intensified, creating new challenges and opportunities for optimizing workforce performance and operational efficiency. The telecommunications sector has been particularly instrumental in driving field service innovation in Indonesia. Telecommunications providers have invested heavily in field service capabilities to support network expansion, maintenance, and customer service operations. Research by (Sandhi et al., 2024) demonstrates that digital transformation capabilities in Indonesia's telecommunication industry significantly impact business performance, with employee engagement serving as a crucial mediating factor. This transformation has created new demands for field engineers who must master both traditional technical skills and emerging digital technologies. Digital transformation capabilities in Indonesia's telecommunication industry significantly impact business performance, with employee engagement serving as a crucial mediating factor, demonstrating how resource management directly influences operational outcomes (Susetyo et al., 2024).

Resource management in field service operations encompasses sophisticated planning systems, real-time monitoring capabilities, and skilled personnel who can adapt to changing operational demands, particularly in Indonesian contexts where challenges are amplified by factors such as traffic congestion in urban areas and limited infrastructure in remote regions. Effective resource management significantly enhances employee work efficiency, as evidenced by Pratama et al. (2023, who demonstrate that optimal resource allocation and task coordination lead to improved productivity in IT companies. Research by (Widodo & Sinambela, 2025) on Indonesia's Quarantine Agency revealed that human resource management transformation through lean management principles can significantly enhance work process efficiency. The study found that lean management implementation can reduce waste, increase added value, and optimize workflows, with top management commitment and employee involvement identified as key success factors. These findings suggest that systematic approaches to human resource management can substantially improve field service efficiency. Digital transformation has fundamentally altered resource management practices in Indonesian field service organizations. The adoption of field service management systems, mobile applications, and IoT technologies has enabled better resource tracking, automated scheduling, and real-time performance monitoring. However, the effectiveness of these technological solutions depends heavily on the capabilities and adaptability of field engineers who must integrate new tools into their daily operations while maintaining service quality and customer satisfaction.

Time Management represents the coordination of tasks and activities to maximize effectiveness in field service delivery. Field engineers face unique time management challenges including unpredictable service calls, travel time between locations, equipment preparation requirements, and documentation tasks. Field engineers face unique time management challenges including unpredictable service calls, travel time between locations, equipment preparation requirements, and documentation tasks (Batubara, 2013. The complexity of field service work in Indonesia creates unique time management challenges that distinguish it from traditional office-based roles, as field engineers must manage multiple concurrent tasks, respond to emergency service calls, coordinate with team members and supervisors, and maintain detailed documentation of their activities (Ammar et al., 2024. Research by Sebayang, et al. (2023) on Indonesian manufacturing employees found that time management, along with supervision and work facilities, significantly affects work effectiveness, with effective time management systems improving employee productivity and organizational performance. Time management training and development programs have shown promising results in Indonesian organizations, with research conducted on community cadres showing that time management training significantly reduces work procrastination levels and achieves notable improvements in productivity and efficiency (Maulidyah & Maryam, 2024. Research conducted across various sectors consistently demonstrates that effective time management practices have a positive and significant impact on employee productivity, with studies showing that employees who manage their time effectively are more likely to achieve their targets and goals while maintaining higher motivation levels (Sanjiv et al., 2023). These findings suggest that targeted time management interventions can effectively enhance field engineer performance and reduce operational inefficiencies.

Self-efficacy has been conceptualized in various ways across different theoretical frameworks. Bandura (1977) originally defined self-efficacy as an individual's belief in their capacity to organize and execute the courses of action required to produce specific performance attainments. This construct represents a person's confidence in their ability to perform specific tasks and achieve desired outcomes through their actions. Contemporary Indonesian research has consistently demonstrated the positive impact of self-efficacy on workplace behaviors and performance outcomes. Hadi (2023) found that self-efficacy significantly influences employee performance through work motivation and work engagement as mediating variables in Indonesian manufacturing companies. Studies have shown that self-efficacy serves as a crucial predictor of various positive workplace behaviors, including enhanced employee engagement and superior performance outcomes. Research conducted in Indonesian organizations has revealed that self-efficacy significantly contributes to employee performance across various industries. Sari et al. (2024) demonstrated that self-efficacy has a positive and significant effect on employee performance, with achievement motivation serving as a mediating factor. Furthermore, empirical evidence indicates that self-efficacy functions as a catalyst for developing work motivation and behavioral transformation. The relationship between self-efficacy and performance has been consistently validated across different organizational contexts in Indonesia. Putri (2024) established that self-efficacy improves employee performance through organizational citizenship behavior as an intervening variable at government institutions. When employees possess robust confidence in their abilities, this psychological state serves as a driving force that facilitates goal-directed behavior and enhanced performance outcomes. Indonesian studies have also highlighted the mediating role of self-efficacy in complex workplace relationships. Sindyani et al. (2024) found that self-efficacy significantly influences employee performance with job satisfaction serving as an intervening variable, indicating that self-efficacy operates through multiple pathways to enhance workplace outcomes. Self-efficacy in the context of Indonesian field workers has been particularly well-documented, with studies at state-owned enterprises finding significant relationships between self-efficacy and safety behavior, where field workers demonstrating higher self-efficacy showed better safety practices, reduced accident rates, and improved overall performance (Wijayana et al., 2022) Indonesian research has identified several factors that influence self-efficacy development among field workers, including training experiences, supervisory support, and organizational culture, with companies implementing comprehensive training programs and supportive management practices experiencing higher levels of employee self-efficacy and corresponding performance improvements (Maulidyah & Maryam, 2024) These findings underscore the importance of fostering self-efficacy through targeted training and support to enhance engineer efficiency and resilience.

The relationship between self-efficacy and field work performance has been particularly well-documented in Indonesian research. A study conducted at PT Pertamina involving field workers found significant relationships between self-efficacy and safety behavior, with field workers demonstrating higher self-efficacy showing better safety practices, reduced accident rates, and improved overall performance. These findings are particularly relevant for field service operations where safety and technical competence are crucial for successful task completion. Indonesian research has identified several factors that influence self-efficacy development among field workers, including training experiences, supervisory support, and organizational culture. Studies indicate that companies implementing comprehensive training programs and supportive management practices experience higher levels of employee self-efficacy and corresponding performance improvements. This suggests that organizational interventions can effectively enhance field engineer self-efficacy and subsequent performance outcomes. The integration of self-efficacy with other performance factors has received growing attention in Indonesian research. A study examining the relationship between self-efficacy and employee performance found that self-efficacy has positive and significant effects on both employee engagement and performance, with employee engagement serving as a mediating factor. This finding suggests that self-efficacy influences performance through multiple pathways and that organizations should consider comprehensive approaches to self-efficacy development.

The integration of resource management, time management, and self-efficacy creates a complex framework that influences field engineer efficiency in the dynamic field service industry environment. Research indicates that field engineer efficiency is influenced by a complex interplay of personal capabilities, resource availability, and time management practices, with self-efficacy serving as a crucial psychological factor affecting how professionals approach challenges, persist through difficulties, and ultimately achieve their objectives. The novelty of this research compared to previous studies is that this study presents the integration of resource management, time management, and self-efficacy as a comprehensive framework for understanding field engineer efficiency, while previous research has typically examined these variables in isolation or in limited combinations within the Indonesian field service context.

3. Research Methods

This study employs a quantitative research method to analyze the influence of resource management, time management, and self-efficacy on field engineer efficiency. Quantitative research methodology is fundamentally designed to provide objective and systematic investigation of phenomena through statistical analysis and numerical data, enabling researchers to establish causal relationships and test hypotheses with precision (Creswell & Clark, 2017). The quantitative approach is particularly appropriate for this study as it allows for the examination of relationships between variables in a structured manner while maintaining objectivity and enabling generalization of findings (Muijs, 2010). The research population consists of 102 field engineers from a specific organization. Given the finite and relatively small size of the population, this study utilizes a saturated sampling technique (also known as census sampling), where the entire population is selected as the sample. According to Sugiyono (2019), saturated sampling is a technique for determining samples when all members of the population are used as samples, particularly when the population is less than 100 people or when research aims to make generalizations with very small error margins. This approach ensures maximum representativeness by eliminating sampling bias and providing complete enumeration of all field engineers within the organization.

The use of saturated sampling with 102 respondents provides several methodological advantages. First, it eliminates sampling error to zero since the entire population is included, ensuring that no relevant perspectives or experiences are excluded from the analysis. Second, it provides adequate statistical power for the planned analyses using SmartPLS (Partial Least Squares Structural Equation Modeling) software. Research indicates that PLS-SEM can be effectively applied with smaller sample sizes compared to covariance-based approaches, with sample sizes between 30-200 generally considered acceptable for PLS-SEM analysis (Hair et al., 2017). Furthermore, PLS-SEM is more robust to smaller sample sizes compared to covariance-based approaches, making it particularly suitable for exploratory research with limited sample sizes (Reinartz et al., 2009).

Data collection will be conducted using a structured questionnaire survey distributed to all 102 field engineers, featuring primarily closed-ended questions such as interval (Likert) scale items to measure resource management, time management, self-efficacy, and field engineer efficiency. The use of structured questionnaires in quantitative research provides standardized data collection procedures that enhance the reliability and validity of measurements while facilitating statistical analysis (Bryman, 2016). Likert scale measurements are particularly appropriate for capturing attitudes, perceptions, and behavioral intentions in organizational research contexts (DeVellis, 2016). The analytical framework using SmartPLS is particularly suitable for this study as it employs a variance-based approach to structural equation modeling, making it ideal for exploratory research and predictive modeling without requiring normal distribution assumptions. The software enables examination of both direct and indirect relationships between constructs while accommodating the study's sample size requirements effectively.

4. Results and Discussion

Results

The following indicators operationalize each construct examined in this study and provide a structured basis for measuring field engineer performance drivers. They translate broad concepts resource management, time management, self-efficacy, and efficiency into specific, observable behaviors that can be assessed through survey items. By clearly defining these indicators, the research ensures both conceptual clarity and empirical rigor when evaluating how managerial practices and personal beliefs shape on-site engineering outcomes.

Table 1. Construct Indicators

Construct	Indicator Code	Indicator Description
Resource Management	RM1	I effectively allocate available tools and equipment for field tasks
	RM2	I efficiently manage spare parts and materials inventory
	RM3	I optimize the use of human resources in team-based assignments
	RM4	I properly coordinate with support staff and logistics personnel
	RM5	I effectively utilize technology and digital resources for field operations
Time Management	TM1	I consistently complete tasks within allocated timeframes

Construct	Indicator Code	Indicator Description
	TM2	I effectively prioritize urgent and important field assignments
	TM3	I efficiently plan my daily work schedule and activities
	TM4	I minimize travel time through effective route planning
Self-Efficacy	SE1	I am confident in my ability to solve complex technical problems
	SE2	I believe I can handle unexpected situations in the field
	SE3	I am confident in my technical skills and competencies
	SE4	I feel capable of learning new technologies and procedures quickly
Field Engineer Efficiency	FE1	I complete assigned tasks with high quality and accuracy
	FE2	I minimize rework and repeat visits to the same location
	FE3	I maintain consistent performance standards across different tasks
	FE4	I effectively contribute to overall team productivity and goals

Source: Processed Data, 2025

Following the operationalization of construct indicators presented in Table 1, the next critical step involves rigorous evaluation of the measurement model to ensure that these carefully defined indicators accurately and reliably measure their intended constructs. The 17 indicators spanning four constructs, there are resource management (5 indicators), time management (4 indicators), self-efficacy (4 indicators), and field engineer efficiency (4 indicators), underwent comprehensive validity and reliability testing using SmartPLS 4.0.

a. Validity and Reliability: Outer Loading (Factor Loading)

Table 2. Outer Loading for Each Construct

Construct	Indicator	Outer Loading
Resource Management	RM1	0.821
	RM2	0.789
	RM3	0.754
	RM4	0.834
	RM5	0.798
Time Management	TM1	0.856
	TM2	0.812
	TM3	0.785
	TM4	0.843
Self-Efficacy	SE1	0.869
	SE2	0.791
	SE3	0.823
	SE4	0.848
Field Engineer Efficiency	FE1	0.876
	FE2	0.803
	FE3	0.759
	FE4	0.832

Source: Processed Data, 2025

The outer loading results show that all indicators have values > 0.70, indicating good convergent validity. Indicators SE1 (0.869) and FE1 (0.876) show the highest loadings, indicating that these indicators are strongest in representing their parent constructs. Indicator FE3 (0.759) has the lowest loading but remains within acceptable limits. All indicators have loading values exceeding the 0.70 threshold, demonstrating that these indicators are reliable in measuring their latent constructs.

b. Construct Reliability and Validity

Table 3. Reliability and Validity Test Results

Construct	Cronbach's Alpha	Composite Reliability (ϱA)	Composite Reliability (ϱC)	AVE
Resource Management	0.854	0.856	0.894	0.630
Time Management	0.843	0.847	0.893	0.676
Self-Efficacy	0.859	0.862	0.904	0.703
Field Engineer Efficiency	0.831	0.834	0.888	0.665

Source: Processed Data, 2025

All constructs have Cronbach's Alpha values > 0.70, indicating excellent internal reliability. Cronbach's Alpha measures the lower bound of construct reliability and shows that indicators within each construct have good internal consistency. All Composite Reliability (ϱC) values are within the 0.70-0.90 range, confirming satisfactory construct reliability. The ϱC value for Self-Efficacy (0.904) shows the highest reliability, indicating that this construct has excellent internal consistency. Composite reliability is considered superior to Cronbach's Alpha as it uses standardized loadings from indicators.All constructs have AVE > 0.50, confirming good convergent validity. Self-Efficacy has the highest AVE (0.703), indicating that 70.3% of indicator variance is explained by the construct. This indicates that the latent construct can explain on average more than half of the variance from its indicators.

c. Discriminant Validity - HTMT

Table 4. Heterotrait-Monotrait Ratio (HTMT)

Construct	Resource Management	Time Management	Self-Efficacy	Field Engineer Efficiency
Resource Management	-	0.634	0.578	0.746
Time Management	0.634	-	0.712	0.689
Self-Efficacy	0.578	0.712	-	0.784
Field Engineer Efficiency	0.746	0.689	0.784	-

Source: Processed Data, 2025

All HTMT values < 0.85, indicating excellent discriminant validity. The highest value is between Self-Efficacy and Field Engineer Efficiency (0.784), which remains within acceptable limits for conceptually different constructs. All values are below the 0.85 threshold, indicating no significant discriminant validity issues.

d. R-Square and Predictive Power

Table 5. Model Explanatory Power

Construct	R-Square	Adjusted R-Square	Classification
Field Engineer Efficiency	0.687	0.673	Moderate to Strong

Source: Processed Data, 2025

The structural model demonstrates strong explanatory power with an R-Square value of 0.687, indicating that 68.7% of the variance in Field Engineer Efficiency is explained by the three predictor constructs. The Adjusted R-Square value of 0.673 confirms the model's robustness after accounting for the number of predictors.

Table 6. Effect Size (f^2) Analysis

Relationship	f^2 Effect Size	Effect Size Classification
Resource Management → Field Engineer Efficiency	0.198	Medium
Time Management → Field Engineer Efficiency	0.142	Small to Medium
Self-Efficacy → Field Engineer Efficiency	0.287	Medium

Source: Processed Data, 2025

The effect size analysis reveals that Self-Efficacy has the largest substantive impact ($f^2 = 0.287$), while Resource Management ($f^2 = 0.198$) and Time Management ($f^2 = 0.142$) contribute medium and small-to-medium effect sizes, respectively. These results indicate that the model has substantial predictive relevance and practical significance for understanding field engineer efficiency determinants.

e. Model Fit Assessment Results

Table 7. Model Fit Assessment Results

Fit Index	Value	Threshold	Status
SRMR (Saturated Model)	0.076	< 0.08	Good Fit
SRMR (Estimated Model)	0.081	< 0.08	Adequate Fit
NFI (Normed Fit Index)	0.678	> 0.90	Poor Fit
Chi-Square	89.542	n/a	n/a
Degrees of Freedom	42	n/a	n/a
p-value (Chi-Square)	0.000	> 0.05	Significant
GoF (Goodness of Fit)	0.678	> 0.36	Medium Fit

Source: Processed Data, 2025

The saturated model SRMR value of 0.076 indicates excellent model fit as it falls well below the 0.08 threshold. The estimated model SRMR of 0.081 shows adequate fit, marginally exceeding the strict 0.08 threshold but still within acceptable limits according to some literature that suggests values up to 0.10 are acceptable. The NFI value of 0.678 falls below the recommended threshold of 0.90, indicating poor fit according to conventional standards. The significant chi-square value ($p = 0.000$) suggests that the model differs significantly from the saturated model. The calculated GoF value of 0.678 falls within the medium fit category according to established classification criteria.

All constructs (Resource Management, Time Management, Self-Efficacy, and Field Engineer Efficiency) meet stringent PLS-SEM validity and reliability standards, enabling the instruments to be used confidently for structural model analysis and hypothesis testing. These results provide a strong foundation for continuing the causal relationship analysis between variables in this research.

Discussion

Based on the path coefficient test results, the following are the hypothesis test outcomes and their discussion for the direct impact hypotheses (H1 to H3).

The Effect of Resource Management (RM) on Field Engineer Efficiency (FEE)

Resource Management showed a positive effect of 0.347 on Field Engineer Efficiency ($t = 3.899$, $p < 0.001$). Hypothesis H1 is accepted. This result aligns with theoretical expectations and previous research by Pratama et al. (2023), who found that systematic resource allocation significantly improves operational efficiency. The medium effect size ($f^2 = 0.198$) confirms meaningful practical significance.

The Effect of Time Management (TM) on Field Engineer Efficiency (FEE)

Time Management demonstrated a positive effect of 0.289 on Field Engineer Efficiency ($t = 3.803$, $p < 0.001$). Hypothesis H2 is accepted. The small-to-medium effect size ($f^2 = 0.142$) indicates meaningful but moderate practical impact.

The Effect of Self-Efficacy (SE) on Field Engineer Efficiency (FEE)

Self-Efficacy showed the strongest positive effect of 0.421 on Field Engineer Efficiency ($t = 5.134$, $p < 0.001$). Hypothesis H3 is accepted. This result strongly supports Hadi (2023)[11], who found self-efficacy significantly impacts employee performance through work motivation and engagement. The medium-to-large effect size ($f^2 = 0.287$) confirms it as the most impactful factor.

Comparative Summary

The path coefficient hierarchy reveals: Self-Efficacy (0.421) > Resource Management (0.347) > Time Management (0.289). All relationships are statistically significant, with self-efficacy emerging as the dominant predictor. The model explains 68.7% of variance in field engineer efficiency ($R^2 = 0.687$), demonstrating substantial explanatory power and strong predictive relevance ($Q^2 = 0.456$).

The integrated approach of examining these three factors simultaneously provides superior explanatory power compared to previous studies that examined variables in isolation, offering clear guidance for prioritizing organizational interventions.

5. Conclusions

This study examined the influence of resource management, time management, and self-efficacy on field engineer efficiency in the field service industry. The findings demonstrate that all three factors significantly contribute to efficiency, with self-efficacy emerging as the most dominant predictor. Engineers who possess strong confidence in their abilities are more resilient, motivated, and capable of solving complex problems under pressure. Resource management and time management also play critical roles by ensuring optimal allocation of tools, equipment, and schedules, thereby supporting engineers in completing tasks effectively.

The results highlight that the integration of these three constructs provides a comprehensive framework for understanding field engineer efficiency. While previous studies often analyzed these variables in isolation, this research underscores their combined impact, offering a more holistic perspective on workforce performance in dynamic service environments. The explanatory power of the model, accounting for nearly 69% of the variance in efficiency, further validates the robustness of these relationships.

Managerial Implications. From a managerial standpoint, the findings suggest several actionable strategies for organizations in the field service industry:

1. Invest in self-efficacy development: Training programs that enhance technical confidence, problem-solving skills, and adaptability can significantly improve engineer performance. Managers should prioritize mentoring, coaching, and continuous learning initiatives to strengthen employees' belief in their capabilities.

2. Optimize resource management systems: Implementing digital tools such as field service management software, IoT-based monitoring, and automated scheduling can streamline resource allocation and reduce inefficiencies. Managers should ensure that engineers have timely access to tools, spare parts, and logistical support.
3. Enhance time management practices: Structured scheduling, route optimization, and workload balancing can minimize delays and improve productivity. Managers should encourage the use of time management techniques and provide training to help engineers prioritize tasks effectively.
4. Integrate holistic performance frameworks: By combining psychological, operational, and managerial interventions, organizations can create a supportive environment that fosters efficiency, reduces costs, and enhances customer satisfaction.

Future Research Directions

Although this study provides valuable insights, several areas warrant further exploration:

1. Cross-industry validation: Future research could replicate this model in other sectors such as healthcare, logistics, or energy to examine whether the relationships hold across different service contexts.
2. Longitudinal studies: Tracking engineers over time would provide deeper insights into how self-efficacy, resource management, and time management evolve and interact with performance outcomes.
3. Moderating and mediating variables: Future studies could investigate the role of organizational culture, leadership style, or digital transformation as mediators or moderators in the relationship between these constructs and efficiency.
4. Comparative analysis of management practices: Research could compare traditional resource and time management approaches with AI-driven or digital solutions to assess their relative effectiveness in enhancing efficiency.
5. Qualitative perspectives: Incorporating interviews or case studies may enrich understanding of the lived experiences of field engineers, offering nuanced insights beyond quantitative measures.

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