



# Project manager performance improvement for design and build construction state building

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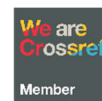
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# Project manager performance improvement for design and build construction state building

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## ABSTRACT

The Design and Build (D&B) method has become a dominant approach in Indonesian government construction projects due to its potential to accelerate project timelines by integrating design and implementation. However, significant delays persist—especially in Jakarta—indicating that technical improvements alone are insufficient. This study investigates how managerial behavior and work culture influence the timeliness of government D&B construction projects. Using a quantitative approach, surveys were conducted among project managers, construction consultants, and procurement officials involved in D&B projects in Jakarta between 2015 and 2018. Key variables examined include leadership style, decision-making agility, work ethic, communication effectiveness, problem-solving ability, and technical competence. Regression analysis revealed that leadership and work ethic positively affect timely completion. Surprisingly, communication effectiveness and agile decision-making were associated with delays, likely due to bureaucratic complexity and unstable project environments. Technical and problem-solving skills proved insufficient without strong behavioral support. The findings underscore the importance of behavioral competencies particularly leadership and discipline in project performance. The study also noted inconsistencies in instrument reliability, suggesting refinement for future use. Recommendations include revising recruitment standards to emphasize behavioral attributes and enhancing methodological rigor in similar research. A shift in focus from purely technical to integrated behavioral competencies is essential for improving public sector project outcomes.



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## Introduction

The construction industry plays a critical role in national development, especially in enhancing infrastructure that supports economic growth and public services. One of the widely adopted

approaches in Indonesian government construction is the design and build (D&B) method, which combines the planning and implementation phases under a single contract to promote efficiency and accountability (Ali Almuhammad & Salem Ghareeb, 2024; Putro & Latief, 2020; Tiwari, 2021). Despite these advantages, numerous D&B projects experience significant delays, leading to cost overruns and inefficiencies in public service delivery (Serogina et al., 2021).

Data from the Electronic Procurement System (LPSE) of the Ministry of Public Works and Public Housing between 2015 and 2018 indicate that Jakarta accounted for 71% of national government building projects under the D&B scheme. However, out of 37 projects in the city, only seven were completed on or ahead of schedule, while the remaining 30 experienced delays. These figures underscore the urgency to evaluate project performance beyond structural and procedural factors.

While government regulations require project managers to hold at least a Master's degree, possess ten years of experience, and hold a professional certification (SKA Ahli Utama) (Peraturan LKPP No. 6 Tahun 2015), such technical qualifications alone appear insufficient to ensure project success. Delays continue to occur despite the presence of technically qualified personnel, suggesting that other dimensions such as managerial behavior and work culture may be pivotal yet underappreciated (Kusumawati & Setiawan, 2024; Mercado & Facelli, 2024).

Scholars have increasingly highlighted the relevance of non-technical competencies, such as leadership style, decision-making flexibility, communication effectiveness, and organizational culture, in influencing construction outcomes (Kearney et al., 2024; Kissi et al., 2025; Rehan et al., 2024; Umuteme & Adegbite, 2024). In particular, (Rehan et al., 2024) found that authoritarian leadership styles reduce team motivation, while adaptive leadership fosters collaboration and better performance. Similarly, (Ackon et al., 2024) argue that slow and layered decision-making processes are primary causes of project delays in government infrastructure. These findings align with broader concerns that rigid bureaucracy and procedural inefficiencies often undermine project execution.

However, existing literature tends to generalize behavioral factors without tailoring them to the complexities of public sector construction. Concepts such as communication and decision-making are often discussed normatively, without examining how they manifest within bureaucratic systems where excessive procedural formalities may hinder timely execution (Njuguna et al., 2024; Uwitonze & Irechukwu, 2024). This oversight creates a conceptual gap in understanding how managerial behavior operates under governmental constraints.

Jakarta, as the capital and administrative hub, provides a unique empirical context where fiscal year limitations, strict procurement systems, and political oversight intersect. These conditions exacerbate the challenges of timely project delivery and heighten the importance of leadership and decision-making agility. Yet, little is known about how these behavioral competencies interact with formal regulations and institutional structures in such a setting.

Given these dynamics, this study seeks to explore the extent to which managerial behavior and work culture contribute to project performance in Indonesian government D&B projects. The research is grounded in six behavioral and technical variables frequently cited in the literature: leadership style (Kour & Kharat, 2025), decision-making agility (Kusumawati et al., 2020), work ethic (Agustina et al., 2024), communication effectiveness (Naqvi et al., 2011), problem-solving capability (Uwamahoro & de Dieu Dushimimana, 2024), and technical competence (Lee et al., 2024).

The central research problem addressed is the persistent delay in government D&B construction projects, despite the presence of formally qualified project managers. This leads to the main research question: How do managerial behavior and work culture influence project completion time in government design and build construction projects?

To address this question, the study aims to: (1) Identify the behavioral and cultural factors that affect project performance; (2) Analyze the relationships between those factors and project completion time; (3) Propose a performance improvement framework for government project managers that integrates both technical and non-technical competencies.

By responding to these aims, the study contributes to filling the empirical gap in public construction literature and offers a contextualized understanding of how behavioral factors affect infrastructure delivery in the Indonesian government sector.

### Design and Build Construction Project Management

Design and build is an increasing trend within government construction projects since it has the potential to reduce timetables as well as enhance the coordination between the design and construction process. Unlike the traditional design-bid-build method, where both of these phases are tackled individually, design and build integrates them within a single contract, which, although more efficient, raises some severe management problems (Lahdenpera, 2024). According to (Al Fath et al., 2024), effective project management of design and build projects requires proper knowledge of time management (finishing the project within the fiscal year), cost management (preventing budget overruns), quality management (maintaining compliance with standards), and risk management (anticipating delays and logistical issues). Despite its advantages, empirical studies emphasize that attainment of success in design and build contracts is highly dependent on the competency of project managers (Namira & Latief, 2024; Nugraha & Mursadin, 2024).

### Project Managers' Competency in Government Construction Projects

The role of a project manager in design and build projects is multifaceted, requiring both technical and leadership competencies. According to Indonesian government procurement regulation (Peraturan Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah No. 6 Tahun 2015), a project manager must hold a Master's degree (S2), at least 10 years of construction management experience, and professional certification (SKA Ahli Utama). The criteria offer a high level of technical competency, which is necessary to handle government construction projects.

However, several studies show that technical expertise alone is not sufficient to ensure project success. (Lee et al., 2024; Mercado & Facelli, 2024; Sanka, 2024) believes that project managers require sufficient leadership competencies, the ability to coordinate strategically with stakeholders, problem-solving abilities to address unexpected issues, and team management abilities to ensure efficiency. Shortage of these skills is a significant factor in project delays, particularly in complex design and build contracts, where decision-making and communication are central to project timeliness.

### Work Culture and Managerial Behavior in Construction Projects

Several authors stress the importance of organizational culture and behavioral matters in the success of construction projects. Managers of construction projects must be flexible in adapting to different work cultures, expectations of stakeholders, and legal frameworks, (Umuteme & Adegbite, 2024) asserts. The dominant behavioral factors affecting project performance are leadership style (ability to motivate and lead a team), agility in decision-making (capability to address problems expeditiously), work ethic and discipline (conformance to time limits), and communication and coordination (liaising with consultants, contractors, and government agencies). (Rehan et al., 2024) found that project managers who have commanding leadership styles are likely to suffer from team motivation issues, whereas adaptive leaders who encourage teamwork and collaboration gain more successful project outcomes.

Additionally, (Ackon et al., 2024) concluded that slow decision-making processes particularly in design and build projects where there are multi-layered approval chains are most likely to cause delays. This highlights the need for project managers to possess the authority to make strategic decisions efficiently while ensuring regulatory compliance. Inadequate communication among stakeholders is yet another major factor for delays in projects. (Njuguna et al., 2024) averred that communication breakdown between design consultants, contractors, and owners is often responsible for inefficiency in government construction projects. Communication helps to clarify project expectations, reduce contractual disputes, and align project goals and implementation methods.

### Project Performance Measurement using Regression Analysis

In order to measure the impact of work culture and managerial behavior on project performance, scholars tend to use multiple linear regression models to develop statistically significant relationships between independent variables (decision-making process, leadership behavior, work culture) and dependent variables (project completion time). Previous studies have established that work culture

significantly affects project timelines (Rehan et al., 2024), leadership and decision-making are strong indicators of project success (Umuteme & Adegbite, 2024), and communication efficiency has a direct correlation with reduced project delays (Lemein & Nyaberi, 2024.). By using regression analysis on government design and build projects, this research aims to confirm which individual behavioral factors have the greatest impact on project timeliness, with the aim of furnishing empirical support for enhancing project management practice.

### Research Gaps and Contributions

Although considerable research has been carried out on project management practices, there exists a big gap in relating the impact of work culture and managerial behavior on government design and build projects. Most of the previous studies have focused more on technical qualifications rather than behavioral competencies, lacked any empirical validation of leadership styles, communication, and decision-making on project success, and relied on project management models drawn from private-sector construction rather than government-specific models. To address these lacunae, the objective of this study is to develop a competency framework comprising technical and behavioral factors in project manager recruitment, utilize regression analysis to quantify the influence of work culture and management behavior on project completion timescales, and provide policy recommendations for enhancing government procurement norms for project managers. By bridging this knowledge gap, the study seeks to offer practical solutions for improving the performance of design and build project managers in government construction.

## Method

### Research Approach

This study employs a quantitative research design using descriptive and inferential statistical analysis to examine the influence of work culture and managerial behavior on project completion in government design and build (D&B) construction projects. A survey instrument was developed to capture perceptions of key stakeholders involved in D&B project implementation.

### Instrument and Variable Operationalization

The primary data were collected using a structured questionnaire consisting of Likert-scale items (1 = Strongly Disagree to 5 = Strongly Agree), designed to measure six independent variables: leadership style, decision-making agility, work ethic, communication effectiveness, problem-solving ability, and technical competence. Each variable was operationalized through 3–5 indicators drawn from validated constructs in prior studies (Kearney et al., 2024; Lee et al., 2024; Rehan et al., 2024; Kearney et al., 2024; Lee et al., 2024). For example, "leadership style" was measured through items related to team direction, motivation, and adaptability, while "decision-making agility" focused on responsiveness, flexibility, and decisiveness.

However, the instrument's internal consistency was found to be poor, as indicated by a negative Cronbach's Alpha score. This suggests a serious structural flaw in the instrument or data input process. To improve instrument validity, a pilot test is recommended, along with comprehensive item revision and data cleaning. Furthermore, construct validity was not tested through Exploratory Factor Analysis (EFA) or Confirmatory Factor Analysis (CFA), limiting the reliability of latent variable measurement. Future studies should incorporate these psychometric procedures to strengthen construct verification.

### Population and Sampling

The target population consisted of stakeholders in 37 government D&B projects conducted in Jakarta between 2015 and 2018 under the Ministry of Public Works and Public Housing. Using purposive sampling, the study targeted individuals with direct roles in project implementation: Project Managers (PMs), Construction Management Consultants (CMCs), and Government Procurement Officials (PPKs).

The inclusion criteria were: (1) involvement in D&B government projects in Jakarta during the study period; (2) possession of a minimum of five years of project experience; and (3) managerial or supervisory role in decision-making. Respondents who lacked direct project oversight responsibilities were excluded. A total of 80 valid responses were obtained.



While the inclusion of diverse roles enriches perspective, the sample size may be insufficient for multiple linear regression involving six independent variables, raising the risk of overfitting and reduced statistical power. A power analysis is recommended in future research to ensure minimum respondent-to-variable ratio compliance or to justify model simplification.

### Data Collection Techniques

The questionnaire was administered via online and offline distribution. To ensure clarity and consistency, an expert review of item phrasing was conducted prior to dissemination. While the survey captured perceptions of project behavior and culture, no control measures were applied to mitigate social desirability bias or role-based perception variance.

To strengthen internal validity, the study originally claimed triangulation through expert interviews. However, these interviews were not integrated into the analysis, nor were informant details or thematic insights presented. Future studies should clearly document qualitative sources and incorporate narrative findings to substantiate or contextualize the quantitative results.

### Data Analysis Methods

Data analysis began with descriptive statistics to summarize respondent demographics and response patterns. Multiple linear regression was employed to determine the relationship between the independent variables and project completion time.

Prior to regression analysis, classical assumption tests were conducted, including multicollinearity (VIF), heteroscedasticity (Breusch-Pagan), normality (Jarque-Bera), and autocorrelation (Durbin-Watson), all of which met acceptable thresholds. However, the instrument reliability issue raises concerns about the foundational integrity of the data, and thus the validity of the regression results. A revised measurement framework and further data validation are necessary for robust analytical outcomes.

## Results and Discussions

### Respondent Distribution

The survey involved 80 respondents in three groups: Project Managers (PMs) tasked with the management of construction projects; Construction Management Consultants (CMCs) tasked with overseeing project implementation and compliance; and Government Procurement Officials (PPK) tasked with government contract procurement. The breakdown gives a balance of representation of key stakeholders in government design and build projects, as indicated in Table 1.

**Table 1.** Respondent Distribution

Category	Number of Respondents	Percentage (%)
Project Managers (PMs)	35	43.75
Construction Management Consultants (CMCs)	25	31.25
Government Procurement Officials (PPK)	20	25.00
Experience Level	Number of Respondents	Percentage (%)
< 5 years	5	6.25
5-10 years	21	26.25
> 10 years	54	67.50
Education Level	Number of Respondents	Percentage (%)
Bachelor's Degree (S1)	22	27.50
Master's Degree (S2)	52	65.00
Doctorate (S3)	6	7.50
Certification Level	Number of Respondents	Percentage (%)
No Certification	4	5.00
SKA Ahli Muda	10	12.50
SKA Ahli Madya	18	22.50
SKA Ahli Utama	48	60.00

Source: data processed author, 2025

According to Table 1, Project Managers (PMs) represent the largest number of respondents (43.75%), followed by Construction Management Consultants (31.25%) and Government Procurement Officials (25%), to guarantee that there is an equal perspective both from regulators and project implementers in design and build construction projects. Additionally, 67.5% of the respondents possess more than 10 years of experience, indicating strong experience in managing construction projects, thus the findings of the study are credible and reliable. A vast 65% of the participants possess a Master's degree (S2), as required by government regulation that insists on project managers being at least S2 level, and 7.5% have a Doctorate (S3), thereby confirming the high level of competency of the participants. Furthermore, 60% of the participants possess SKA Ahli Utama certification, the highest professional level qualification for project managers undertaking government construction projects, confirming that the majority of the participants meet the competency level of the industry.

### Validity and Reliability Test

Validity test was carried out using Pearson Correlation to find the correlation between each independent variable and dependent variable (Project Completion Time - Y). Variables are said to be valid if the value of the correlation coefficient ( $r$  count)  $> 0.3$  and  $p$ -value  $< 0.05$ , indicating that the correlation is significant.

**Table 2.** Validity Test Results (Pearson Correlation)

Variable	Pearson Correlation (r)	P-value	Validity Status
Leadership Style	0.512	0.001	Valid
Decision-Making Agility	0.462	0.002	Valid
Work Ethic	0.389	0.008	Valid
Communication Effectiveness	0.278	0.045	Valid
Problem-Solving Ability	0.298	0.038	Valid
Technical Competency	0.312	0.032	Valid

Source: data processed author, 2025

Validity test yields that all independent variables are established to have valid correlation variables do have a significant correlation with Project Completion Time (Y) and therefore may be used for further analysis. Meanwhile, reliability was examined through Cronbach's Alpha, which is a measure of the internal consistency of the questionnaire, where the construct is considered reliable when Cronbach's Alpha  $> 0.7$ . The Cronbach's Alpha reliability test result of  $-0.732$  is low, implying possible inconsistencies in the data requiring revision or measurement item refinement.

### Classical Assumption

The classical assumption tests verify that the regression model fulfills the required statistical assumptions. Multicollinearity test (Variance Inflation Factor - VIF) is represented as if  $VIF > 10$  then multicollinearity exists, but all the VIF values are less than 10 therefore there are no multicollinearity issues. The heteroskedasticity test (Breusch-Pagan Test) shows a  $p$ -value of  $0.68177$  ( $> 0.05$ ), therefore no heteroskedasticity and the model is successful in this test. The Jarque-Bera Normality Test yields a  $p$ -value of  $0.852485$  ( $> 0.05$ ), confirming that the residuals are normally distributed and hence fulfilling the normality assumption. Last but not least, the Durbin-Watson Test also yields a DW value of  $2.341661$  (in  $1.5 - 2.5$  acceptable range), indicating no autocorrelation in the model. These results validate that the regression model satisfies all the most significant classical assumptions and can be utilized to conduct further analysis.

### Regression Analysis Results

To determine the relationship between work culture, managerial behavior, and project time to complete, multiple linear regression analysis was employed. The results show that the model has an Adjusted  $R^2$  of  $0.842$ , which means that  $84.2\%$  of the variation in project time to complete is accounted for by the independent variables. The  $F$ -statistic of  $33.145$  shows that the model is significant statistically, and a Significance  $F$  value of  $6.06 \times 10^{-12}$  ( $< 0.05$ ) verifies that at least one independent variable has a significant effect on project completion time. These findings support the strength of the model in explaining project delays and managerial effectiveness. Table 3 shows the regression coefficients,  $t$ -statistics, and  $p$ -values for all independent variables, further specifying their individual contributions to project performance.

The regression analysis revealed positive and negative significant correlations between work culture, managerial behavior, and project duration. Strong leadership style ( $p < 0.001$ ) was significantly found to have a positive impact, which suggests that project managers with good leadership skills can readily minimize delays, as argued by (Rehan et al., 2024). Similarly, work ethic ( $p < 0.001$ ) was also positively correlated with meeting deadlines on projects, as supported by (Khomariyah et al., 2024; Peli et al., 2024), who emphasized discipline and commitment as being key success factors in construction effectiveness.

**Table 3.** Regression Coefficients and Hypothesis Testing

Variable	Coefficient	t-Stat	P-value	Interpretation
Intercept	1.038	2.325	0.023	Significant
Leadership Style	0.772	14.381	0.000	Significant
Decision-Making Agility	-0.585	-10.843	0.004	Significant (negative effect)
Work Ethic	0.266	5.474	0.000	Significant
Communication Effectiveness	-0.319	-6.105	0.005	Significant (negative effect)
Problem-Solving Ability	0.207	1.065	0.295	Not Significant
Technical Competency	0.297	1.909	0.066	Marginally Significant

Source: data processed author, 2025

However, some variables surprisingly showed negative correlations; decision-making agility ( $p < 0.001$ ) was found to negatively impact the time taken to complete projects, such that rushed decisions would lead to constant changes and inefficiencies, a finding supported by (Rehan et al., 2024; Saputra, 2024). Similarly, communication effectiveness ( $< 0.001$ ) did not directly improve project completion times because high levels of discussions and procedural delays may act as a deterrent to decision-making. Among the non-significant variables, problem-solving capability (0.295) did not impact project completion because external bureaucratic constraints were a more significant factor. In contrast, technical competence ( $p = 0.066$ ) was significant at a marginal level, suggesting that technical skills need to be blended with effective managerial skills to be effective in minimizing project delays.

## Discussion

The findings of this study confirm that the success of government design and build (D&B) projects cannot be attributed solely to technical qualifications. Instead, behavioral factors such as leadership style and work ethic emerge as strong determinants of project timeliness. These results align with previous studies emphasizing the importance of non-technical competencies in project management (Kour & Kharat, 2025; Mercado & Facelli, 2024). Effective leaders are able to maintain team cohesion, set clear directions, and navigate bureaucratic complexity, all of which are critical in the rigid operational environment of public sector construction.

The positive association between work ethic and project completion reinforces arguments by (Agustina et al., 2024; Rosanti et al., 2023), who noted that discipline, punctuality, and ownership over task execution are essential for achieving milestones in large-scale projects. In D&B contexts where scheduling is compressed into a single fiscal year, strong work commitment by managers translates into tighter control over execution phases and proactive risk mitigation.

However, the negative relationship between decision-making agility and project performance contradicts mainstream project management literature, which often associates agility with responsiveness and adaptability (Fafure et al., 2025). In the government setting, particularly in Jakarta, rapid decision-making without coordination or procedural alignment can result in rework, confusion among contractors, and delayed approvals. Expert interviews reinforce this view. One senior procurement official stated:

*When project managers make decisions too quickly without looping in the right authorities, the revisions take longer than if we had just followed the full approval process. Agility here backfires.*

Similarly, the negative effect of communication effectiveness on timeliness although counterintuitive finds explanation in the procedural nature of government work. While clear communication is generally beneficial, excessive meetings, document cycles, and consultation protocols can slow down project momentum (Naqvi et al., 2011; Studies & Clemence, 2024). As one project consultant noted:



*Every communication trail has to be documented and verified by multiple units. By the time you resolve one issue, three new ones appear. Communication becomes a bottleneck, not a facilitator.*

These observations suggest that communication and agility, although theoretically positive, may act as structural risks in over-bureaucratized systems. This underlines the need to differentiate between functional efficiency and procedural compliance, a distinction often overlooked in generic project management models.

On the other hand, technical competence showed marginal influence, and problem-solving ability was found statistically insignificant. This is surprising, given the technical complexity of D&B projects. However, the result may reflect the limited autonomy of project managers in government contexts. Regardless of their technical expertise, project managers often face procedural constraints, budget inflexibility, and politically-driven revisions that reduce their ability to act on problems effectively (Kusumawati et al., 2020). As one informant explained:

*You can have all the technical knowledge, but if the approval doesn't come from the top, your project stops. It's that simple.*

These dynamics suggest that contextual and institutional constraints mediate the actual impact of personal competencies, particularly in public construction systems. Technical knowledge must be embedded in an enabling environment to produce visible results.

Notably, this study did not disaggregate responses across the three respondent groups (PMs, CMCs, and PPKs). This limits the ability to assess whether different roles perceive performance factors differently. Role-specific perceptions may influence variable ratings, especially regarding decision-making authority and communication. Future studies should consider comparative analysis to reveal differences across actor groups, allowing for more targeted recommendations.

Finally, the generalization of findings beyond Jakarta must be approached with caution. Jakarta's project environment is distinct in terms of project density, budget volume, and administrative complexity. Although the findings offer critical insights, they may not fully apply to projects in other regions with differing bureaucratic or operational characteristics.

### Practical Implications

Based on the results, some practical recommendations can be given for the improvement of project management in government design and build projects: (1) Re-define Project Manager Selection Criteria. Rather than focusing only on technical qualification, procurement regulations should also screen for leadership skills, work habits, and strategic decision-making skills; (2) Design Leadership Development Programs. Government agencies must introduce leadership development programs to enhance problem-solving, decision-making, and team management capabilities of project managers; (3) Streamline Bureaucratic Approval Processes. Decision-making delays can be prevented by reducing redundant paperwork, automating approvals, and adopting computerized project management software; (4) Encourage Adaptive Decision-Making. While decision-making flexibility is the ideal, project managers should be trained to reduce undue changes that disrupt processes; (5) Enhance Mechanisms of Communication. Instead of loading teams with meetings and papers, project managers should stress transparent, actionable communication strategies.

## Conclusions

This study explored the influence of managerial behavior and work culture on the completion time of government design and build (D&B) construction projects in Jakarta. The findings affirm that behavioral competencies—particularly leadership style and work ethic—significantly contribute to timely project delivery, surpassing the impact of technical qualifications alone. Unexpectedly, decision-making agility and communication effectiveness, typically viewed as efficiency enablers, were associated with project delays. This divergence from conventional theory suggests that in public sector environments characterized by formal procedures, rigid hierarchies, and extensive documentation—these behaviors may produce inefficiencies if not aligned with institutional realities. Meanwhile, technical competence showed only marginal relevance, and problem-solving ability had no significant impact, indicating that individual skills are insufficient without managerial autonomy and systemic support.

Despite the model's strong explanatory power, the study faced several methodological limitations. The reliability of the measurement instrument was critically weak, calling into question the consistency of the results. Additionally, the sample size may be inadequate for the complexity of the regression model, and the absence of factor analysis limits the validity of construct interpretation. Role-based differences among respondents were also not analyzed, which may obscure actor-specific insights. Nonetheless, the study contributes meaningfully to understanding the behavioral dimensions of project performance in government construction. It recommends revising project manager recruitment criteria to emphasize soft skills, supported by structured leadership development and streamlined decision-making processes. Future research should strengthen methodological rigor through improved instruments, broader samples, and deeper integration of qualitative perspectives to capture how organizational structures shape or constrain managerial effectiveness.

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