Fostering Innovation at Work: The Influence of Transformational Leadership Through Psychological Empowerment and Organizational Culture

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Abstract. Scholars in organizational behavior widely acknowledge the role of transformational leadership in fostering innovation, yet they have conducted only a limited number of empirical studies on its underlying mediating mechanisms. This study investigates two mediating pathways—psychological empowerment and organizational culture—in the relationship between transformational leadership and innovative work behavior (IWB). Drawing on survey data from 392 employees in the manufacturing sector in Central Java, Indonesia, the study employs partial least squares structural equation modeling (PLS-SEM) to evaluate both the measurement and structural models. The results indicate that psychological empowerment and organizational culture significantly mediate the relationship between transformational leadership and IWB. Moreover, transformational leadership exhibits a direct positive effect on both mediators and on innovative work behavior. These findings underscore the importance for managers and HR practitioners to adopt leadership practices that empower employees and cultivate an innovation-supportive organizational culture. Conceptually, this study enriches the existing literature by identifying and validating two key mediating mechanisms within the context of the manufacturing industry in a developing country, specifically Indonesia.

Keywords: innovative work behavior; transformational leadership; psychological empowerment; organizational culture

1 Introduction

Innovation is a critical driver of organizational competitiveness, enabling firms to maintain relevance, adapt to change, and secure long-term performance and sustainability [1,2]. In emerging economies such as Indonesia, innovation is shaped by unique socio-economic conditions, including a projected demographic bonus between 2030 and 2040, when about 64% of the population will be of productive age [3]. Concurrently, the Making Indonesia 4.0 program seeks to accelerate the transition from a resource-based to a knowledge- and innovation-based economy by using disruptive technologies to boost national manufacturing performance and productivity [4]. The World Bank has reported that the estimated need for nine million additional digital talents by 2030 underscores the urgency of leadership that can adapt to change and foster employee engagement and innovation [5]. These structural shifts in Indonesia's economy and workforce call for leadership approaches that merely emphasize transactional exchanges or short-term efficiency, which are unlikely to harness the full potential of this transformation. Instead, transformational leadership—inspiring vision, fostering adaptability,

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and motivating beyond immediate rewards—offers a more robust framework for driving sustained employee engagement and innovation in such a dynamic context [6,7,8].

Transformational leadership—defined by vision articulation, individualized consideration, and intellectual stimulation—has been consistently linked to innovative work behaviour (IWB), psychological empowerment, and supportive organizational cultures [9,10,11]. The relationship is particularly urgent in Indonesia's manufacturing sector, which now contributes around 20 percent of GDP, employs over a fifth of the workforce, and ranks as the world's 10th-largest manufacturing economy—yet is under pressure from international competition, cost constraints, and logistical challenges [12]. Through intellectual stimulation and inspirational motivation, transformational leaders create environments where creativity can thrive [9], a capability especially valuable in Indonesia's manufacturing sector, where innovation must coexist with structured operational processes. However, the pathways through which transformational leadership influences innovative work behaviour are complex and multifaceted, warranting an analytical approach that accounts for parallel mediators.

From a theoretical perspective, existing studies have primarily examined either psychological empowerment or organizational culture in isolation as mediating mechanisms in the transformational leadership–IWB relationship, leaving unanswered questions about their combined and potentially complementary effects when tested as parallel mediators [13,14,15,16]. From a contextual perspective, there is limited empirical evidence from emerging economies, particularly Indonesia's manufacturing sector, despite its economic significance and unique cultural-workforce dynamics. From a methodological perspective, few studies employ integrated quantitative models such as PLS-SEM to test multilevel mediation in a single framework, which may limit the robustness and generalizability of prior findings [17].

Addressing these gaps, this study simultaneously examines a key employee-level factor—psychological empowerment—and an organizational-level factor—organizational culture—as parallel mediators, offering a more holistic understanding of how transformational leadership translates into innovative outcomes. Situated within Indonesia's manufacturing sector, the study extends the applicability of leadership and innovation theory to a critical economic context. This study offers practical implications for leadership and HR strategies that enhance innovation by aligning individual empowerment and supportive organizational cultures.

2 Literature Review

Through interrelated psychological and contextual processes, transformational leadership (TL) influences innovative work behaviour (IWB). At the individual level, TL behaviours such as vision articulation, intellectual stimulation, and individualized consideration enhance employees' sense of meaning, competence, autonomy, and impact—core dimensions of psychological empowerment (PE) [18]—which in turn strengthen intrinsic motivation and proactive engagement in innovation [19,20]. From the organizational level perspective, TL shapes shared norms and values, fostering a supportive organizational culture (OC) characterized by openness, collaboration, and tolerance for risk, creating a fertile environment for generating and implementing novel ideas [21,22]. These individual and contextual pathways are not mutually exclusive but operate in parallel, jointly amplifying the effect of TL on IWB. In this way, PE and OC act as complementary mediators, capturing both the personal agency and the environmental support essential for sustained innovative behaviours.

Prior research consistently positions TL as a powerful predictor of IWB. By inspiring a shared vision, challenging existing assumptions, and providing individualized support, transformational leaders create conditions where employees feel encouraged to generate,

promote, and implement new ideas [9,10,23,24]. Empirical evidence across diverse sectors shows TL fosters risk-taking, creativity, and proactive problem-solving [25,26]. Studies in the Indonesian context further suggest that TL can enhance IWB even in highly structured environments such as manufacturing, where operational efficiency must be balanced with creative adaptation [27]. Based on these arguments, the first hypothesis is formulated as:

H1: Transformational leadership positively and significantly affects innovative work behaviour.

Beyond its direct influence, TL shapes employees' psychological states, particularly PE, which reflects an individual's sense of meaning, competence, self-determination, and impact at work [18]. Leaders who communicate a compelling vision and encourage autonomy can foster higher levels of empowerment by making employees feel capable, valued, and in control of their work outcomes [28]. Our literature review confirms that TL behaviours, especially intellectual stimulation and individualized consideration, enhance PE by providing opportunities for skill development and decision-making [13,14]. In line with this reasoning, it is hypothesised that:

H2: Transformational leadership has a positive and significant effect on psychological empowerment.

TL also plays a critical role in shaping OC. Leaders influence organizational norms and values by modelling desired behaviours, rewarding innovation, and fostering adaptability [21,29]. In environments led by transformational leaders, collaboration and trust tend to flourish, creating an atmosphere that supports experimentation and collective learning [30,31]. Studies have shown that TL can drive cultural shifts toward greater participation and openness, facilitating innovative outcomes [32,33]. Accordingly, the third hypothesis is proposed as:

H3: Transformational leadership has a positive and significant effect on organizational culture.

The link between PE and IWB is well-established in the literature. Empowered employees exhibit greater confidence in their abilities, are intrinsically motivated, and are willing to engage in creative problem-solving [19,20]. The autonomy and sense of purpose associated with empowerment encourage individuals to take initiative in developing and implementing new ideas [34]. Research also indicates that PE boosts individual performance and is a critical mediator between leadership and innovation [35]. Given this evidence, the following hypothesis is advanced:

H4: Psychological empowerment positively and significantly affects innovative work behaviour.

Similarly, OC has been identified as a fundamental determinant of IWB. A culture that values learning, openness, and risk-taking gives employees the psychological safety to experiment and innovate [21,22]. Organizational norms that support creativity reduce the fear of failure, encourage collaboration, and facilitate knowledge sharing—vital conditions for sustained innovation [36,37]. Evidence from multiple contexts confirms that supportive cultures are positively associated with higher levels of IWB [38,39]. Drawing from these insights, it is proposed that:

H5: Organizational culture positively and significantly affects innovative work behaviour.

Although TL can directly enhance IWB, its influence is transmitted through mediating variables. PE is one such mechanism: by empowering employees psychologically, TL equips them with the confidence and motivation to engage in innovative behaviours [28,34]. Several studies have documented this mediating effect, showing that TL's impact on IWB is amplified when employees feel empowered to act on their ideas [20,35]. From this standpoint, the sixth hypothesis is stated as follows:

H6: Psychological empowerment mediates the relationship between transformational leadership and innovative work behaviour.

In parallel, OC functions as an important contextual mediator. By fostering a culture that supports experimentation, collaboration, and adaptability, TL indirectly promotes IWB through the organizational environment it cultivates [29,36]. Cultural transformation driven by TL has been linked to sustained innovation performance, as employees are more likely to engage in creative behaviours when their work environment actively supports such efforts [39,40]. Considering this body of evidence, the final hypothesis is proposed as:

H7: Organizational culture mediates the relationship between transformational leadership and innovative work behaviour.

3 Method

3.1 Research Design

This study employed a quantitative survey design to examine the direct and indirect effects of transformational leadership (TL) on innovative work behaviour (IWB), with psychological empowerment (PE) and organizational culture (OC) as parallel mediators. A cross-sectional approach was deemed appropriate for capturing employees' perceptions across multiple manufacturing organizations at a single point in time [41]. Data analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM), which is appropriate for testing complex models involving multiple mediators and latent constructs measured by multiple indicators [42,43].

3.2 Research Context and Sampling

The research was conducted in the manufacturing sector of Semarang City, Central Java Province, Indonesia, a significant industrial hub representing a context where structured operational processes coexist with increasing innovation demands. The target population comprises full-time employees working under direct supervision and in operational or administrative functions. A non-probability convenience sampling method was employed due to its viability in organizational behavioral studies [44]. The survey was distributed online between December 15, 2024, and January 5, 2025, via targeted email invitations to manufacturing employees. Out of 400 questionnaires distributed, 392 valid responses were obtained, resulting in an effective response rate of 98%. The sample included respondents from diverse manufacturing subsectors, ensuring variability in work contexts while maintaining relevance to the goals of this study.

3.3 Research Instrument

The questionnaire was developed by adapting previously validated scales to measure the four latent constructs. All items were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) [45]. The research instrument and its Cronbach's Alpha are presented in Table 1.

Table 1. Research instrument

Construct	Item Codes	No. of Items	Cronbach's Alpha	Modified
Innovative work behaviour	IWB1 to IWB5	5	0,864	[12]
Transformational leadership	TL1 to TL6	6	0,903	[12]
Psychological empowerment	PE1 to PE10	10	0,905	[14]
Organizational culture	OC1 to OC8	8	0,888	[15]

3.4 Data Analysis Procedure

The data analysis followed the two-stage approach recommended in PLS-SEM literature [42,43]. The measurement model assessment evaluated reliability using Cronbach's alpha and composite reliability (CR), with all values exceeding the recommended 0.70 threshold [46]. Convergent validity was confirmed through factor loadings above 0.70 and Average Variance Extracted (AVE) values exceeding 0.50 [46]. Discriminant validity was established using the Fornell–Larcker criterion, ensuring that the square root of each construct's AVE exceeded its inter-construct correlations [47].

In the structural model assessment, path coefficients, t-statistics, and p-values were estimated using bootstrapping with 5,000 resamples, as recommended by Hair et al. [42]. Mediation effects were tested via specific indirect effect estimates in SmartPLS 4.1.0.0, and the model's predictive power was evaluated using the coefficient of determination (R^2), effect size (f^2), and predictive relevance (Q^2) [42,43].

4 Result

4.1 Demographics Analysis

Most respondents were male (50.8%) and had 1-5 years of job tenure (68.4%), demonstrating a solid representation of the intended population. Many respondents (27.3%) came from the food and beverage industry, reflecting the Central Java Province landscape, followed by the textile industry (20.7%), where both sectors have a prominent role.

4.2 Measurement Model

As per Fig.1, all constructs met the recommended reliability and validity thresholds. Cronbach's alpha (CA) and composite reliability (CR) values were above 0.70 [46], indicating internal consistency. All constructs ' average variance extracted (AVE) values exceeded 0.50, confirming convergent validity [46]. Discriminant validity was established via the Fornell–Larcker criterion, with the square root of each construct's AVE greater than its correlations with other constructs [47].

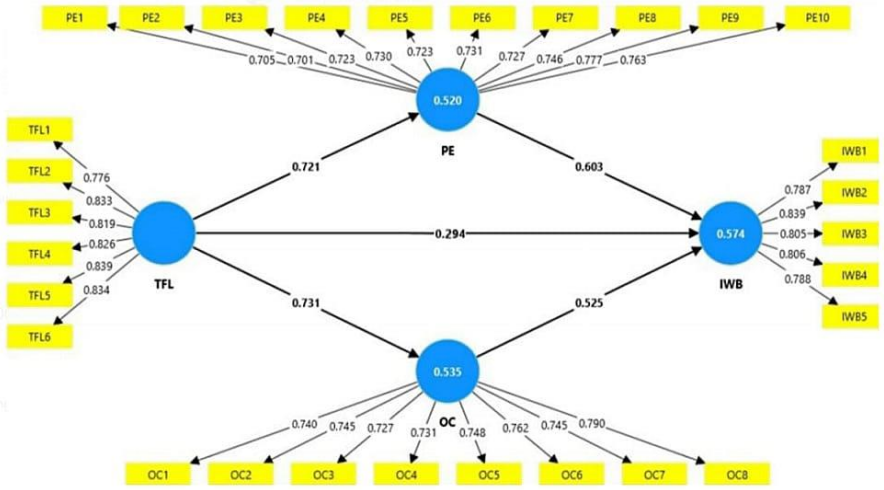

Fig. 1. Results of the structural model assessment

4.3 Structural Model

The PLS-SEM structural model was evaluated using path coefficients (β), t-statistics, and p-values obtained from bootstrapping with 5,000 resamples [42]. The results are presented in Table 2.

Table 2. Path coefficients analysis

Hypothesis	Path coefficients	Original Sample	T-statistic (|O/ STDEV|)	p-value	Supported?
H1	TL→IWB	0,294	5,131	0,000	Yes
H2	TL → PE	0,721	29,041	0,000	Yes
H3	TL → OC	0,731	26,698	0,000	Yes
H4	PE → IWB	0,603	8,844	0,000	Yes
H5	OC → IWB	0,525	7,443	0,000	Yes
Specific indirect effect					
H6	TL→PE →IWB	0,435	7,994	0,000	Yes
H7	TL → OC → IWB	0,384	7,066	0,000	Yes

All seven hypotheses (H1–H7) were supported, with all p-values below 0.000, indicating statistically significant relationships.

4.4 Coefficient of Determination (R^2)

The model demonstrated substantial explanatory power. TL, PE, and OC collectively explained 64.6% of the variance in IWB ($R^2 = 0.646$), TL explained 40.7% of the variance in PE ($R^2 = 0.407$), and TL explained 48.9% of the variance in OC ($R^2 = 0.489$). According to Hair et al. [42], these values represent moderate-to-substantial levels of explanatory power in social science research.

4.5 Predictive Relevance (Q^2)

All Q^2 values exceeded zero using the blindfolding procedure, confirming predictive relevance [43]. Specifically, Q^2 values were 0.421 for IWB, 0.266 for PE, and 0.312 for OC, indicating the model's ability to predict endogenous constructs effectively. The results suggest that the exogenous variables in the model—particularly transformational leadership—contribute meaningfully to the variance in IWB, PE, and OC, and can reliably reconstruct the data. The relatively higher Q^2 value for IWB further underscores the robustness of the model in predicting innovative employee behavior, reinforcing the practical significance of the theoretical framework in real-world organizational settings [49].

4.6 Effect Size (f^2)

Effect size analysis revealed that TL had a significant effect on PE ($f^2 = 0.686$) and OC ($f^2 = 0.958$), but only a small effect on IWB ($f^2 = 0.066$). PE ($f^2 = 0.141$) and OC ($f^2 = 0.146$) exhibited medium effects on IWB, indicating their significant role in explaining innovative behaviours. These findings imply that employees are more likely to engage in innovation when they feel psychologically empowered and operate within a culture that values creativity and risk-taking. Together with the predictive relevance confirmed by Q^2 values, the effect size analysis reinforces the importance of viewing transformational leadership not as a direct catalyst, but as an enabler that cultivates intermediate conditions—namely, empowerment and supportive culture—through which innovation thrives.

5 Discussion

This study addressed the research gap identified in the introduction by examining transformational leadership (TL) and innovative work behaviour (IWB) through the dual mediating mechanisms of psychological empowerment (PE) and organizational culture (OC) in the context of Indonesia's manufacturing sector. Previous research has typically examined either PE or OC in isolation, leaving unanswered questions about their complementary effects when considered simultaneously. By integrating these micro- and macro-level perspectives into a single model, the study offers a more comprehensive explanation of the leadership–innovation link. The results demonstrate that TL positively influences IWB directly, supporting earlier findings that leaders who articulate a compelling vision, challenge established assumptions, and provide individualized support are more likely to inspire employees to generate and implement novel ideas [9,10,23,24]. Although the direct effect is more negligible than the mediated effects, it remains statistically significant, underscoring the intrinsic value of transformational leadership behaviours in fostering innovation, even without intermediary mechanisms.

This relationship is particularly relevant in Indonesia's manufacturing sector, where employees operate under resource constraints, shifting market demands, and the adoption pressures of Industry 4.0—conditions typical of developing economies. In such environments, transformational leadership becomes especially vital: by articulating a compelling vision, challenging conventional assumptions, and offering individualized support, leaders can motivate employees to transcend structural limitations, adapt to technological change, and actively contribute to organizational competitiveness through innovative work behavior. Studies in Indonesian contexts—such as those analyzing local branded fashion—confirm that transformational leadership significantly promotes innovation directly and through mediating organizational culture and innovative work behavior pathways [48].

The strong positive relationships between TL and mediators reinforce the idea that transformational leaders operate as enablers of individual agency and architects of organizational norms [13,15,21,29]. By enhancing PE, leaders boost employees' sense of meaning, competence, autonomy, and impact, which are crucial for sustaining engagement in innovative tasks [19,20,26]. Similarly, by shaping OC, leaders establish norms and values that legitimise experimentation and collaborative problem-solving, creating a climate where innovative ideas can flourish [22,27,36]. The positive associations between PE and IWB and OC and IWB further confirm the importance of addressing individual psychological states and organizational conditions to drive innovation. These findings suggest that empowerment and culture act as distinct yet complementary pathways, offering employees the motivation and the supportive environment necessary for sustained innovative behaviour.

The mediation results validate the proposed parallel mediation model, demonstrating that transformational leadership (TL) influences innovative work behavior (IWB) through dual, complementary pathways: psychological empowerment (PE) and organizational culture (OC). This dual-pathway mechanism extends beyond single-mediator models by capturing both individual-level psychological processes and collective-level cultural dynamics, thereby offering a more comprehensive and nuanced understanding of how leadership fosters innovation. The significant indirect effects via PE align with social cognitive theory, which posits that leaders enhance employees' self-efficacy and intrinsic motivation, enabling them to engage in discretionary, innovative behaviors [50]. Simultaneously, the mediating role of OC reflects the importance of shared norms, values, and climate that support risk-taking and idea sharing—key enablers of innovation at the group and organizational levels [51]. By integrating these two distinct yet interrelated mechanisms, this study responds directly to recent human resource management (HRM) research calls for multilevel, integrative frameworks that bridge micro- and macro-level influences on employee behavior [14,16,39,40]. The findings underscore that effective leadership does not act in isolation but operates through parallel psychosocial and cultural channels to cultivate innovation in complex organizational environments.

The goodness-of-fit indicators reinforce the robustness of the model. The substantial explanatory power for IWB ($R^2 = 0.646$) and the predictive relevance indicated by Q^2 values above the zero threshold demonstrate that the model is theoretically sound and practically predictive [42,43]. The large effect sizes from TL to PE and OC highlight the strength of leadership influence on these mediating variables, while the medium effects from the mediators to IWB underscore their critical role in translating leadership into innovation.

These findings emphasise adopting a dual-pathway perspective when designing leadership and HR strategies to promote innovation. Rather than focusing exclusively on individual empowerment or organizational culture, organisations should consider interventions that simultaneously address both to maximize their workforce's innovative potential. This integrated view offers a more nuanced understanding of leadership influence—particularly in complex, resource-constrained environments such as Indonesia's manufacturing sector, where cultivating empowered employees and an innovation-supportive culture is critical for organizational adaptability and competitiveness..

6 Conclusion, Implication, and Limitation

6.1 Theoretical Implications

This study contributes to the human resource management literature by integrating micro-level and macro-level perspectives to explain how transformational leadership (TL) shapes innovative work behaviour (IWB). By simultaneously examining psychological empowerment (PE) and organizational culture (OC) as parallel mediators, the research addresses a key theoretical gap in prior studies that often treated these mechanisms in isolation [14, 15, 16]. The findings strengthen transformational leadership theory by demonstrating that its effects are amplified when individual and contextual conditions are aligned to support innovation, offering a more holistic framework for understanding leadership–innovation dynamics in organisational settings.

6.2 Practical Implications

For practitioners, the results highlight the importance of leadership development programmes focusing on transformational competencies, including vision articulation, intellectual stimulation, and individualized consideration [9,10]. Human resource policies should be designed to foster psychological empowerment by granting autonomy, recognising contributions, and enhancing competence [19,20]. In parallel, organisational initiatives should aim to build a culture of openness, collaboration, and calculated risk-taking [21,22], as empowerment and culture are critical drivers of IWB. Importantly, these initiatives should not be pursued in isolation but as part of an integrated HR strategy that simultaneously addresses individual and organisational dimensions.

6.3 Contextual Implications

The study's focus on Indonesia's manufacturing sector—an economically significant and operationally complex industry—underscores the value of TL in environments where efficiency must coexist with innovation [12,27]. The confirmation of the dual mediation model suggests that in such contexts, fostering innovation requires strategies that empower individual employees while embedding supportive cultural values at the organisational level. This dual emphasis may be especially relevant for emerging economies undergoing rapid industrial and technological transformation.

6.4 Limitations and Future Research

Despite its contributions, the study is not without limitations. The cross-sectional design restricts causal inference, suggesting that longitudinal or experimental studies could provide deeper insight into the temporal dynamics of leadership and innovation [41]. The reliance on self-reported data introduces common method bias, which future research could address through multi-source data collection or objective performance measures [44]. Additionally, while the model explained a substantial proportion of variance in IWB, exploring other mediators—such as psychological safety, learning orientation, or team climate—could further enrich the understanding of leadership's influence on innovation. Extending the analysis to other sectors and cultural contexts would also test the generalisability of the findings and refine the applicability of the parallel mediation framework.

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